ORIGINAL ARTICLE

Interdental cleaning: A cross-sectional survey of patients attending a tertiary health institution in Nigeria

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ABSTRACT

Background: Removal of bacterial plaque, the primary etiological factor for periodontal disease, from the oral cavity is one of the modes of preventing this disease, however it is not known if bacterial plaque formed in interdental areas are being cleaned effectively like other tooth surfaces since they are relatively inaccessible. **Aim:** The aim was to determine the interdental cleaning behavior of patients attending dental clinics of a tertiary health institution in a developing country. **Materials and Methods:** A cross-sectional study in which information such as; tooth surfaces being cleaned regularly, interdental cleaning aids, cleaning frequency, knowledge of interdental cleaning and its source was collected using structured questionnaires from adult patients attending the Dental Centre of the University College Hospital, Ibadan, Nigeria. Data were analyzed using SPSS version 21. **Results:** A total of 246 patients participated in the study and the mean age was 40.4years (standard deviation = 17.4). There were 134 (54.5%) females. Only 86 (35%) were aware of interdental cleaning and 57 (23.2%) practiced it regularly; 39 (15.9%) used dental floss, 12 (4.9%) interdental brushes, 5 (2.0%) wood sticks and 1 (0.4%) used rubber tip stimulators. Two patients used blade and broomstick in addition. The main reason for not cleaning interdentally was no prior knowledge in 160 (65.0%) patients. **Conclusion:** Less than a quarter of the patients in this study engaged in regular cleaning of the interdental surfaces and lack of knowledge was the major reason for not doing so. Dissemination of information about the importance of interdental cleaning is therefore recommended.

Key words
Dental floss, interdental, self-cleaning, tooth cleaning

INTRODUCTION

Self-cleaning of the teeth still remains the most effective means of bacteria plaque removal, which is the primary etiological factor implicated in the pathogenesis of periodontal diseases; an inflammatory condition that occurs when there is an imbalance in the interplay between local infection and the inflammatory response of the host.[1,2] Self-cleaning of the teeth provides mechanical removal of bacteria plaque, which if adequately carried out leaves the dental surfaces free. Incorporation of the appropriate skills of tooth cleaning should include all the teeth surfaces with emphasis on interdental areas that have been reported as the initiating sites for periodontal diseases.[3] Similarly, the interdental surfaces are the most implicated locations for the development of periodontal diseases and dental caries.[4] Gingival inflammation is, in addition, worst in these areas.[5] Although the toothbrush remain the most commonly used nonprofessional means of bacteria plaque control, it may leave the interdental areas incompletely cleaned of bacteria plaque thus additional conscious and regular cleaning with interdental cleaning aids is required.[4,5] Common interdental cleaning aids include dental floss, interdental wood sticks, interdental brushes and tapes. The use of any of these aids is mostly dependent on the morphology of the interproximal tooth surface, the size and shape of the interdental area as well as patient factor in maintaining oral hygiene.[5] Recent studies have shown that interdental cleaning of teeth with the appropriate aids reduces plaque accumulation and gingivitis, and that interdental cleaning is not associated with periodontal pocketing.[5,6] However, most people tend to neglect this important habit, cleaning all other tooth surfaces and leaving the interdental areas untouched as the task is tedious, require meticulousness, as well as good manual skills.[7] It is not known if this is the case in our environment, as there is a dearth of information on

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interdental cleaning. This becomes more important from a preventive dentistry aspect in this environment as there is poor awareness of basic oral hygiene measures as well as high prevalence of periodontal diseases.[8-10] Moreover, it will be advantageous if the different materials used for cleaning interdentally in this environment are known since each device has its indications for use. Likewise, finding out reasons for not engaging in this healthy behavior among dental patients will help in modifying appropriately the oral health education programs in existence for patients in this dental center. The findings will also be used at the policy level in the country and other developing nations when planning intervention programs for dental patients. The objectives of this study, therefore, included determining the prevalence of interdental cleaning among the patients attending the dental clinics of a tertiary health institution in a developing country, determining the aids that are used for this and documenting reasons why dental patients do not engage in this good oral health behavior.

MATERIALS AND METHODS

The study was conducted at the Dental Centre of the University College Hospital, Ibadan, Nigeria. It was a descriptive cross-sectional study, and the participants were consecutive adult patients aged 18 years and above attending the dental clinics for routine dental check-up and treatment between January 2013 and August 2013. The sample size was calculated using the Kish formula for cross-sectional studies[11] with a periodontal disease prevalence rate of 81.8% used from a previous study conducted in the same environment.[12] A minimum sample size of 229 patients was generated. In the conduct of this study, there was strict compliance with the Helsinki Declaration principles on research involving human subjects. Patients were approached individually; the purpose of the study explained and consents were taken before the administration of questionnaires. The questionnaire was pretested among adult patients who did not participate in the final study. Information about the patients' sociodemographic characteristics, tooth cleaning habits and interdental cleaning were obtained with the aid of the questionnaires, which were self-administered in most cases and interviewer-administered to patients who could neither read nor write.

Questions asked about the sociodemographic characteristics were age, gender, marital status, occupation and educational level. The occupational class was classified according to the OPCS (1991) that was modified and used in this environment.[13] The stratification was into three classes: Class I – skilled workers, Class II – unskilled workers and Class III – dependents.

This was modified by adding students to Class III made up of dependents. The information sought on tooth cleaning habits were; type of tooth cleaning device, the oral structures and surfaces of the teeth that were regularly cleaned (regularity for this study was defined as being at least once daily). Information on the materials used for interdental cleaning, frequency, duration of cleaning for those who engage in this habit, knowledge of interdental cleaning and the source of knowledge; and reasons for not engaging in this habit were also sought. Incompletely filled questionnaires were discarded before data entry.

Data collected were entered into the SPSS version 21 and analyzed. Test of association was done using Chi-square statistics. In order to eliminate the number of empty cells, age, marital status and educational level were dichotomized. Age was dichotomized around the mean age, marital status was classified as married and others (including the singles, divorced and widowed). Educational level was categorized into two groups: having at least tertiary education in one group and others, which included those with no formal education or who had secondary and postsecondary education in the other group.

RESULTS

Sociodemographic characteristics of the study participants [Table 1]

A total of 246 patients participated in the study. Their ages ranged from 16 to 82 years, and the mean age was

Table 1: Sociodemographic characteristics of the study participants

Variable	No	%
Age (years)		
≤34	112	45.5
35-44	39	15.9
45-54	39	15.9
≥55	56	22.8
Total	246	100.0
Gender		
Males	112	45.5
Females	134	54.5
Total	246	100.0
Marital status		
Married	133	54.1
Others	113	45.9
Total	246	100.0
Educational level attained		
≤6 years	47	19.1
Secondary/post secondary	56	22.8
At least tertiary	143	58.1
Total	246	100.0
Occupational class		
Skilled workers	79	32.1
Unskilled workers	68	27.6
Dependants	99	40.2
Total	246	100.0

40.4 years (standard deviation = 17.4 years). There were 134 (54.5%) females. The data on the marital status of the patients showed that 97 (39.4%) were single, 133 (54.1%) married, 5 (2.0%) divorced and 11 (4.5%) were widowed. The occupational class was such that 79 (32.1%) were skilled workers, 68 (27.6%) were unskilled and 99 (40.2%) were dependents. A total of 26 (10.6%) patients did not receive any form of formal education; 21 (8.5%) had primary education, 54 (22.0%) had secondary education, 2 (0.8%) had post secondary education and 143 (58.1%) had tertiary level of education.

Awareness of interdental cleaning among the study participants

A total of 86 (35.0%) patients were aware of interdental cleaning; 47 (19.1%) got to know about interdental cleaning from the dentist and dental health workers, 4 (1.6%) from the mass media, 4 (1.6%) from physicians and medical health workers, whereas 10 (4.1%) were informed from other sources such as family, spouse, and friends. The remaining 21 (8.5%) were not certain of their sources of information.

Tooth cleaning

Most 135 (57.7%) of the patients cleaned their teeth once in the morning, 90 (38.5%) do so twice, that is, in the morning and at night while 5 (2.1%) cleaned after each meal. Four patients did not clean their teeth regularly. Only 19 (7.7%) used chewing stick while 83 (33.7%) patients used chewing stick and toothbrush.

Tooth surfaces cleaned by the participants

Response to the tooth surfaces cleaned regularly by the patients revealed that 63 (25.6%) cleaned only the occlusal, the buccal and the lingual surfaces of their teeth, 11 (4.5%) cleaned these teeth surfaces in addition to the interdental areas, 122 (49.6%) cleaned the teeth surfaces and tongue while 46 (18.7%) cleaned all the teeth surfaces, interdentally as well as the tongue. Therefore only 57 (23.2%) study participants practiced interdental cleaning.

Frequency of interdental cleaning

The frequency of interdental cleaning was such that 36 (63.2%) cleaned interdentally after each meal and 21 (29.6%) did so after brushing in the morning and or night.

Inter dental cleaning aids/material

Of the patients who cleaned interdentally, the majority 39 (68.4%) used dental floss (of which 55.9% used the handheld/finger rolled type, 38.2% used the device held floss/holder type while 5.9% used both types), 12 (21.1%) used interdental brushes, 5 (8.8%) used dental sticks and 1 (1.8%) used rubber tip stimulators. Two patients used blade and broomstick in addition to the above-mentioned interdental aids.

Reasons for not cleaning interdentally

Of the 86 patients who were aware of interdental cleaning, 57 practiced the technique; the reasons given by the 29 who were aware but did not engage in the behavior included: "Did not feel like using it" (15), "interdental cleaners are not readily available for purchase" (6), "interdental cleaning materials are costly" (3), "it is a waste of time" (1), and "no reasons for not cleaning interdentally" (4).

Sociodemographic characteristics and interdental cleaning [Table 2]

Significant association was found between age, marital status, educational level, occupational class and cleaning interdentally ($P < 0.05$). No significant association was found between gender and cleaning of the teeth interdentally ($P > 0.05$). Similarly, no significant association was found between frequency of tooth brushing and cleaning interdentally.

DISCUSSION

The purpose of this study was to assess the interdental cleaning behavior of patients attending the dental clinics of a tertiary health institution in a developing country. Analysis of our results showed that less than a quarter (23.2%) of the patients engaged in regular interdental cleaning, which is in agreement with other authors,[6,14] but contrary to findings by Ziebolz *et al.*,[15] where 77% of dental assistants and 46% of prophylaxis patients were found doing so. "Prophylaxis patients are patients who participated in dental prophylaxis programs, that is, a minimum of one prophylaxis appointment each year."[15] "This included an oral hygiene control, oral hygiene instruction and professional tooth cleaning as well as fluoride application."[15] The difference noted in these studies may be attributed to the study participants; in the present study they were patients while in the study by Ziebolz *et al.*, they were dental assistants and prophylaxis patients. Dental assistants form part of the dental team and invariably are expected to have good knowledge regarding oral health while prophylaxis patients have been involved in regular preventive oral care and are constantly educated about their oral hygiene.

Oral health awareness of individuals is important in their tooth cleaning behaviour.[16] Poor awareness of interdental cleaning, by 65% of the patients in the present study, was a major underlying reason for not adopting the behavior. The fact that cleaning the interdental areas was considered as being a waste of time or those who were aware of interdental cleaning not feeling like cleaning these surfaces, as indicated by some patients, may be associated with the act of cleaning these teeth surfaces. The act of cleaning interdentally is skill demanding and requires meticulousness, which may explain why

Table 2: Sociodemographic characteristics and interdental cleaning

Variable	Clean interdentally *N* (%)	Do not clean interdentally *N* (%)	Total *N* (%)	χ^2 value	*P* value
Age (years)					
≤40	41 (29.1)	100 (70.9)	141 (100.0)	6.476	0.011*
>40	16 (15.2)	89 (84.8)	105 (100.0)		
Total	57 (23.2)	189 (76.8)	246 (100.0)		
Gender					
Male	22 (19.6)	90 (80.4)	112 (100.0)	1.438	0.231
Female	35 (26.1)	99 (73.9)	134 (100.0)		
Total	57 (23.2)	189 (76.8)	246 (100.0)		
Marital status					
Non married	35 (31.0)	78 (69.0)	113 (100.0)	7.148	0.008*
Married	22 (16.5)	111 (83.5)	133 (100.0)		
Total	57 (23.2)	189 (76.8)	246 (100.0)		
Occupational class					
Skilled	19 (24.7)	60 (75.9)	79 (100.0)	15.868	<0.001*
Unskilled	5 (7.4)	63 (92.6)	68 (100.0)		
Dependants	33 (34.0)	66 (66.7)	99 (100.0)		
Total	57 (23.2)	189 (76.8)	246 (100.0)		
Educational level					
Less than tertiary	10 (9.7)	93 (90.3)	103 (100.0)	18.038	<0.001*
Tertiary	47 (32.9)	96 (67.1)	143 (100.0)		
Total	57 (23.2)	189 (76.8)	246 (100.0)		

*Statistically significant

these reasons were indicated by some patients. The cost and unavailability of interdental aids were other reasons for not cleaning the interdental areas. These and other reasons are important factors that will need to be strongly considered when an intervention is to be planned, especially at the policy level.

The most commonly used interdental aid in this study was dental floss. This is similar to what had been reported by others.[15,17] A review on interdental cleaning methods concluded that all conventional devices are effective, but each method should be suited to a particular patient and also to the situation in the mouth.[18] The handheld or finger rolled type of the dental floss was the most commonly used in this environment, which may be attributed to personal preference or ease of use or rather the availability of this type in the markets. It was noted from the results that nonsurgical flat blade was used to clean interdentally, although only two patients did so, nonetheless, this is unhealthy because blade has sharp edges that can injure oral tissues and the individual using it and this should be part of the message when educating patients in this health institution about their oral health. Blade is not designed for cleaning of the mouth and this habit needs to be actively discouraged.

It was observed that a few of the study participants cleaned their teeth twice daily or more often, similar to findings from a previous study.[19] This is suggestive of poor oral hygiene behavior commoner among the patients, probably a contributing factor to the high prevalence of periodontal disease in this region of the world. In a previous study,[6] the propensity for good oral health behavior such as twice frequent cleaning of the teeth and utilization of dental services was found with interdental cleaning, but this was not the case in this present study. All the patients who cleaned their teeth interdentally did so according to recommendations by the dental team; either after meals or twice daily, which can be also be linked to the source of knowledge being the dentist and dental workforce. They were probably educated before prescription of the interdental aids. This also shows a desirable effort and compliance by this group of people.

The younger patients were noted to practice interdental cleaning better than older ones, which is similar to previous findings.[6] Not being married was equally a sociodemographic characteristic that favored interdental cleaning in this study; this could be attributed to the time factor, which is attached to the marital life style because married individuals may be busier. They may also have less social consideration of tooth aesthetics than others. Similarly, the dependents in the occupational class were found more likely to clean the interdental areas of their teeth regularly than the patients in the other occupational classes, which is not surprising as students constituted the bulk of this class. Students are more likely to source for information than other individuals since they are in the active learning phase, and the school is an important avenue for oral health education.

Incidentally, there was a significant association between educational qualifications and cleaning the interdental areas in this study. Dissemination of information about the importance of interdental cleaning as one of the ways of preventing periodontal diseases and interproximal caries will be beneficial in individuals with similar demographic characteristics to the studied population. Making interdental aids readily available as well as affordable for the populace should be worked toward at the policy level for desirable outcomes.

CONCLUSION

Less than a quarter of the patients in this study engaged in regular cleaning of the interdental tooth surfaces and lack of knowledge was the dominant reason for not doing so.

REFERENCES

1. Westfelt E. Rationale of mechanical plaque control. J Clin Periodontol 1996;23:263-7.
2. Negrato CA, Tarzia O, Jovanovic L, Chinellato LE. Periodontal disease and diabetes mellitus. J Appl Oral Sci 2013;21:1-12.
3. Kocher T, Sawaf H, Warncke M, Welk A. Resolution of interdental inflammation with 2 different modes of plaque control. J Clin Periodontol 2000;27:883-8.
4. Claydon NC. Current concepts in toothbrushing and interdental cleaning. Periodontol 2000 2008;48:10-22.
5. Berchier CE, Slot DE, Haps S, Van der Weijden GA. The efficacy of dental floss in addition to a toothbrush on plaque and parameters of gingival inflammation: A systematic review. Int J Dent Hyg 2008;6:265-79.
6. Crocombe LA, Brennan DS, Slade GD, Loc DO. Is self interdental cleaning associated with dental plaque levels, dental calculus, gingivitis and periodontal disease? J Periodontal Res 2012;47:188-97.
7. Wolff A, Staehle HJ. Improving the mechanical properties of multiuse dental floss holders. Int J Dent Hyg 2014;12:245-50.
8. Taiwo JO, Jeboda SO, Motayo TO, Obiechina AE. Periodontal health of the elderly people in South East local government area in Ibadan, Nigeria. Afr J Med Med Sci 2004;33:285-91.
9. Umoh A, Azodo C. Association between periodontal status, Oral hygiene status and tooth wear among adult male population in Benin City, Nigeria. Ann Med Health Sci Res 2013;3:149-54.
10. Adeyemi BF, Kolude BM, Lawal AO. The knowledge and experience of personal and professional oral care among secondary school students in Ibadan. Odontostomatol Trop 2012;35:5-11.
11. Kish L. Survey Sampling. New York: Wiley Interscience Publication; 1965.
12. Lawal FB, Taiwo JO, Arowojolu MO. Validation of the oral impact on daily performance frequency scale in Ibadan, Nigeria. Afr J Med Med Sci 2013;42:215-22.
13. Esan TA, Olusile AO, Akeredolu PA, Esan AO. Socio-demographic factors and edentulism: The Nigerian experience. BMC Oral Health 2004;4:3.
14. Honkala S, Honkala E, Rimpelä A, Vikat A. Oral hygiene instructions and dietary sugar advice received by adolescents in 1989 and 1997. Community Dent Oral Epidemiol 2002;30:124-32.
15. Ziebolz D, Klopfleisch S, Fresmann S, Hornecker E, Mausberg RF. Oral health of dental assistants and patients receiving maintenance – An investigation based on a district of Thuringia, Germany. Int J Dent Hyg 2013;11:253-9.
16. Sofola O. Implications of low oral health awareness in Nigeria. Niger Med J 2010;51:131.
17. Bergenholtz A, Brithon J. Plaque removal by dental floss or toothpicks. An intra-individual comparative study. J Clin Periodontol 1980;7:516-24.
18. Warren PR, Chater BV. An overview of established interdental cleaning methods. J Clin Dent 1996;7:65-9.
19. Lawal FB, Taiwo JO, Oke GA. Oral health practices of adult inhabitants of a traditional community in Ibadan, Nigeria. Niger J Med 2013;22:212-7.

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