Periodontal Treatment Need, Interdental Cleaning Habit and Dental Services Utilization of a Nigerian Population

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ABSTRACT

Objective: Optimal home-use plaque-control measure maintains a functional dentition and reduces the risk of loss of periodontal attachment throughout life. The combination of toothbrushing and inter-proximal oral hygiene devices optimally prevents plaque accumulation. Individual's attitude, lack of awareness and affordability are barriers for the utilization of dental services. This study evaluated the interdental cleaning habits; periodontal treatment needs and dental service utilization of a Nigerian population.

Methods: Self-administered questionnaires were used to obtain information on socio-demographics, use of interdental cleaning aid and health services utilization of participants. A full-mouth examination was done to assess the periodontal status and the treatment needs of the participants using the CPITN probe. Data was analyzed using Epi info 2008 version 3.5.1

Result: Only 24.4% of the participants who claimed to clean interdentally actually used dental floss and interdental brushes) while majority of them ({160(71.2%)} used toothpicks. Three out of five participants {49(59%)} who do not clean interdentally, didn't know that they had to do so. Though 284(92.2%) of the participants do not routinely access oral care, almost half (49.7%) had previous dental check-ups, scaling and polishing, tooth extractions and restorations. 44(14.3%) did not need periodontal treatment, 131(42.5%) needed Oral Hygiene Instruction (OHI) and Scaling and Polishing (S&P) and 19(6.2%) needed OHI, S&P and sub-gingival scaling.

Conclusion: Dental services utilization was low until they perceived that they have a dental ailment, appropriate interdental aids were not used and knowledge on the need for interdental cleaning and advance periodontal treatment need of the participants were low.

Keywords: Interdental cleaning, Periodontal Treatment Need, Dental Service Utilization

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INTRODUCTION

Dental plaque accumulation is the primary aetiological factor for the development of dental caries and periodontal disease hence its mechanical removal is important for the maintenance of good oral health and, the prevention of dental caries and periodontal diseases [1,2-5]. Optimal plaque control is very important for a successful surgical periodontal therapy.[6] Oral hygiene habits affect the oral health status of an individual and this is important for health promotion interventions [7]

Optimal home- plaque-control measure maintains a functional dentition and reduces the risk of loss of periodontal attachment throughout life.[8] Loe et al.[1] reported mechanical plaque control as the best approach for the prevention and treatment of gingivitis which has a strong cause-effect relationship with accumulation of supra-gingival plaque.

Toothbrushing alone is reported to optimally clean the "flat" surfaces of the teeth only [9]. Since toothbrushing alone gives maximum plaque removal on the facial surfaces of the teeth, the proximal and Interdental dental areas will be "essentially untouched" [10]. This implies that these interdental and proximal areas will accumulate microbial plaque which will subsequently result in periodontal disease.[11]

Claydon[9] reported that the combination of tooth brushing and inter-proximal oral hygiene devices is the optimal method of controlling plaque accumulation. The cleaning effectiveness of tooth brushing is improved by the addition of dentifrice. New brushes are significantly more effective in teeth cleaning than brushes with substantially worn surfaces [12]. Jackson et al [12] demonstrated improved clinical periodontal outcomes in their study subjects following interdental cleaning especially with interdental brushes. Inequalities in oral practices is reported to be dependent on educational level as subjects with low education are found to significantly indulge in more harmful oral practices [13].

Individual's better understanding of health behaviour change for improved oral self-care may be influenced by dental self-efficacy, dental planning and action control [13]. A study [14] in which a sub-optimal oral hygiene practices were observed reported age, gender, field of educational study and cost of treatment as significant determinant factors of oral hygiene habits of the study population.

Increase oral health awareness programmes increases the utilization of preventive dental procedures and dental service utilization.[15] A study in India reported the need for dental surgeons and dental health workers to play appropriate roles in facilitating public enlightenment for individuals so they appreciate the need for dental service utilization [16]. Individual's attitude, lack of awareness and affordability are barriers for the utilization of dental services [17].

Nixon [18] reported a major deficiency in dental health communication between the practitioners and the patients in relation to the Interdental cleaning habits. Lack of knowledge about interdental cleaning was reported by Dosumu and Lawal[19] and they recommended the need for improvement in the dissemination of information on the importance of interdental cleaning to the populace.

Hindrances to effective dental need and demand should be removed in order to improve dental care delivery system considering the enormous difference between normative need, demand and actual utilization of dental care [20]. In order to improve oral health and increase access to dental care, there has to be professional cooperation within dentistry [21].

This study evaluated the interdental cleaning habits; periodontal treatment needs and dental service utilization of a Nigerian population.

MATERIALS AND METHODS

The study was a descriptive cross-sectional study of all consecutive patients attending the Periodontics clinic at the Dental Centre of University of Port Harcourt Teaching Hospital, Rivers State from April 2018 to June 2018. An institutional ethical approval was obtained. A self-administered questionnaire was used to obtain information on socio-demographics, use of interdental cleaning aid and use of oral health services.

A full-mouth examination was done to determine the Community Periodontal Index of Treatment Needs of the participants using a CPITN probe. **CPITN** is an epidemiologic tool developed by the World Health Organization (WHO) for the evaluation of periodontal disease in population surveys, throughout the world. It is a screening procedure which requires clinical assessment for the presence or absence of periodontal pockets, calculus and gingival bleeding using special CPITN probe.

CPITN probe is a specially designed probe and has two types namely: The clinical(C-probe) and the

epidemiological (E-probe). Both probes have ball-ended tips with a diameter of 0.5mm. The E-probe has one black band representing the 3.5mm and 5.5mm markings while the C-probe has two black bands (the second black band represent the 8.5mm-11.5mm marking). The E-probe was used in this study.

For epidemiological purposes in the adult populations, 10 specified index teeth are examined; for persons under 20 years of age only six index teeth are specified.

Sextants- The mouth is divided into sextants defined by tooth numbers. A sextant should be examined only if there are two or more teeth present that are not indicated for extraction. When only one tooth remains in a sextant, this should be included in the adjacent sextant.

Index teeth- For adults aged 20 and above, the teeth examined are:

76	1	67
76	1	67

The sextant is only examined if there are 2 or more teeth not marked for extraction. If one of the first or second molars are missing, no replacement tooth is examined. Molars are examined in pairs and only one score is recorded per sextant. If no index teeth are present, the remaining teeth in the sextant.

CPITN Scoring system:

0 - Health i.e. no pocketing or gingival bleeding on probing.
1 - Gingival bleeding on probing.
2 - Supra\subgingival calculus present
3 - Pathological Pockets of 4-5mm (gingival margin on black area of probe.)
4 - Pathological Pockets ≥ 6mm (black area of probe no longer visible.)

The individual's CPITN score is the maximum or worse score per sextant.

The Treatment Needs

TN 0 = No treatment required
TN 1 = Oral hygiene requires improvement
TN 2 = OHI + subgingival scaling and root planing
TN 3 = OHI + subgingival scaling and root planing + complex periodontal treatment (Periodontal Surgery)

Data analysis was done using Epi info version 3.5.1. Descriptive statistics were obtained and cross tabulation was done using participants' sex. Chi-square test was done to determine Statistical significance and $P < 0.05$ was considered significant.

RESULTS

The demographic details of the participants showed a female predominance: [F= 175(56.8%), M= 133(43.2%)]. Participants mean age was 35.8(± 14.4) years. More of the participants were <45 years and had tertiary education (Table 1).

Table 2 shows that though 225 (73.1%) of participants claimed they clean their teeth interdentally, only 55 (24.4%) actually use the right materials (Dental floss and interdental brushes) to clean. Majority 160(71.2%) of the participants used toothpicks to clean interdentally. Of those who did not clean interdentally, more than three-fifth 49(59%), of them did not know they have to do so. Two hundred and eighty-four (92.2%) of the participants do not routinely access oral care, even though about half 153(49.7%) of them visited the dentists in the past for check-up, Scaling and Polishing, Tooth Extraction and Filling. The most reason given for irregular dental visit is lack of dental problems. (Table 3).

Table 4 shows participants periodontal treatment need. 44(14.3%) of the participants had CPI score 0, 114(37.0%) had 1, 131 (42.5%) score 2 and 19(6.2%) score 3. 114(37.0%) needed oral hygiene instruction (OHI), 150(48.7%) needed OHI scaling and polishing and root planing.

Table 5 shows the association between participants interdental cleaning, dental service utilization and treatment need. The participants' dental service utilization and interdental cleaning did not translate to a better community periodontal treatment need (Table 5).

Table 1. Demographic Details of the Participants based on Gender

Variable	Male n (%)	Female n (%)	Total n (%)	P-value
Age (years)				0.12
≤45	116 (87.2)	141 (80.6)	257 (83.4)	
>45	17 (12.8)	34(19.4)	51 (16.6)	
Ethnicity				0.18
Yoruba	17(12.8)	10(5.7)	27(8.8)	
Igbo	48(36.1)	66(37.7)	114(37.0)	
Hausa	2(1.5)	4(2.5)	6(1.9)	
South-south	66(49.6)	95(54.3)	161(52.3)	
Education				0.11
No Formal	8(6.0)	6(3,4)	14(4.5)	
Primary	3(2.3)	6(3,4)	9(2.9)	
Secondary	20(15.0)	44(25,2)	64(20.8)	
Tertiary	102(76.7)	119(68.0)	221(71.8)	
Occupation				0.13
Self-employed	48 (36.1)	43(24.6)	91(29.6)	
Civil-servants	29 (21.8)	49 (28.0)	78 (25.3)	
Students	45 (33.8)	74 (42.3)	119 (38.6)	
Retirees	4 (3.0)	4 (2.3)	8 (2.6)	
Professionals	7 (5.3)	5 (2.8)	12 (3.9)	
Total	133 (43.2)	175 (56.8)	308 (100.0)	

Table 2: Interdental Cleaning Habit of Participants based on Gender

Variable	Male n (%)	Female n (%)	Total n (%)	P-value
Interdental cleaning				0.32
Yes	101 (75.9)	124 (70.9)	225 (73.1)	
No	32 (24.1)	51 (29.1)	83 (26.9)	
Total	133 (100.0)	175 (100.0)	308 (100.0)	
Interdental cleaning material				0.26
Dental floss	15 (14.9)	26 (21.0)	41 (18.2)	
Toothpick	71 (70.2)	89 (71.8)	160 (71.2)	
Interdental brush	10 (9.9)	4 (3.2)	14 (6.2)	
Others	5 (5.0)	5 (4.0)	10 (4.4)	
Total	101 (100.0)	124 (100.0)	225 (100.0)	
Interdental cleaning frequency				0.16
After brushing	5 (5.0)	12 (9.7)	17 (7.6)	
After eating	80 (79.2)	101 (81.5)	181 (80.4)	
Others	16 (15.8)	11 (8.8)	27 (12.0)	
Total	101 (44.9)	124 (55.1)	225 (100.0)	
If Not, Why Not?				0.34
Not Available	10 (27.8)	15 (31.9)	25 (30.1)	
Don't Remember	3 (8.3)	6 (12.8)	9 (10.9)	
Don't Know	23 (63.9)	26 (55.3)	49 (59.0)	
Total	36 (100.0)	47(100.0)	83 (100.0)	

Table 3. Participants' dental service utilization

Variable	Male	Female	Total	P-value
Past dental visit				0.57
Yes	55 (41.4)	98 (56.0)	153 (9.7)	
No	98 (56.0)	77 (44.0)	155(50.3)	
Total	133	175	308	
Reasons for accessing oral care in the past				0.63
Check up	8 (14.5)	14 (14.3)	22 (14.4)	
Scaling and polishing	19 (34.6)	29 (29.6)	48 (31.4)	
Extraction	12 (21.8)	24 (24.5)	36 (23.5)	
Filling	7 (12.7)	12 (12.2)	19 (12.4)	
Others	9 (16.4)	19 (19.4)	28 (18.3)	
Total	55 (36.0)	98 (64.0)	153 (100.0)	
Regular dental visit				0.57
Yes	9 (6.8)	15 (8.6)	24 (7.8)	
No	124 (93.2)	160 (91.4)	284 (92.2)	
Total	133	175	308	
Reasons for non-regular dental visit				0.001
No dental problem	57 (38.8)	90 (61.2)	147 (100.0)	
Distance	9 (40.9)	13 (59.1)	22(100.0)	
Cost of treatment	31 (49.2)	32 (50.8)	63 (100.0)	
Fear of dental Treatment	13 (48.1)	14 (51.9)	27 (100.0)	
Past dental experience	1 (6.3)	15 (93.7)	16 (100.0)	
No Time	22 (66.7)	11 (33.3)	33(100.0)	

Table 4. Participants Periodontal Treatment Need

Variable	Male n (%)	Female n (%)	Total n (%)	P-value
CPI Score				0.58
0	17 (12.8)	27 (15.4)	44 (14.3)	
1	48 (36.1)	66 (37.7)	114 (37.0)	
2	57 (42.8)	74 (42.3)	131 (42.5)	
3	11(8.3)	8(4.6)	19(6.2)	
CPI Need				0.32
0	17 (12.8)	27 (15.4)	44 (14.3)	
1	48 (36.1)	66 (37.7)	114 (37.0)	
2	68 (51.1)	82 (46.9)	150 (48.7)	
Total	133(100.0)	175(100.0)	308(100.0)	

Table 5. Association between participants interdental cleaning, dental service utilization and treatment need

Variable	Score 0 n (%)	Score 1 n (%)	Score 2 n (%)	Total n (%)	P-value
Interdental cleaning					0.54
Yes	33 (14.7)	85 (37.8)	107 (47.5)	225 (73.1)	
No	11 (13.3)	29 (34.9)	43 (51.8)	83 (26.9)	
Regular dental service utilization					0.61
Yes	4 (16.7)	6 (25.0)	14 (58.3)	24 (7.8)	
No	40 (14.1)	108 (38.0)	136 (47.9)	284 (92.2)	
Total	44 (14.3)	114 (37.0)	150(48.7)	308 (100.0)	

DISCUSSION

Gender and age are major factors that influence dental service utilization; male gender and younger age preponderance and tooth extraction have been reported as the most frequent dental treatment provided.[22,23] This study however, had a female predominance with a mean age of 35.8 ± 14.4 years; majority of the participants were less than 45 years and had tertiary education.

It is reported that the use of interdental brush and floss produces significant reduction in the quantity of plaque and gingival inflammation in the section where they are applied.[24] Daily use of interdental brushes was found to reduce interdental bleeding thus implying that interdental cleaning is an effective means of achieving optimal oral health.[25] Interdental toothbrushes are reported to be more efficacious in interdental supra-gingival plaque removal than dental floss in periodontal maintenance care individuals.[26] Oral irrigators combined with manual toothbrushing daily significantly reduces gingival bleeding scores when compared to the use of dental floss only.[27] In our study, although 73.1% of the participants claimed that they clean their teeth interdentally, only 24.4% actually used dental floss and interdental brushes. Seven out of ten participants used toothpicks while three out of five didn't know that they have to clean interdentally. Thus, we support the recommendation of a study[28] done among dental professionals that emphasized the need for educating the populace on the rationale for interdental cleaning.

Sociodemographic features have been reported to influence the attendance and dental service utilization in a dental outreach program in a population in India.[29] Male gender and cost of dental treatment influenced dental service utilization but the distance to the dental service location did not have much significant effect and felt need have a major impact on dental visits.[30] Our study showed in contrast that female gender and lack of dental problems influenced dental service utilization. Thus, collaborating the fact that felt need is the major determinant of dental service utilization.

Dental pain usually results in more dental visits; but paying out of pocket strongly influenced this with socioeconomic and sociodemographic variables modifying these relationships.[31] Dental awareness has been reported to also positively affect attitude towards dental treatment but this however, does not transcend into opting for treatment.[32,33] Ninety-two percent of our study participants do not routinely access oral care, although almost half (49.7%) had previous dental check-up, scaling and polishing, tooth extraction and filling. The major reason given was lack of dental problems.

These observations showed enormous differences between normative and felt need; and this drives the demand and actual utilization of dental care. These differences may lead to hinderances to effective dental need and demand as reported by Pradeep et al.[33] A Brazilian study[34] reported a high dental treatment need despite improved oral health status and oral hygiene habits in their study participants.

The periodontal treatment needs of our study population showed that almost half of our participants had periodontal treatment need score of 2 and needed OHI, scaling and polishing (S&P) and subgingival root planing.

Though many participants claimed they use interdental cleaning devices, mostly toothpicks; this did not translate to a better community periodontal index as many of our participants still needed CPITN code 2. This is not surprising since there is no scientific evidence that tooth picks are effective in interdental cleaning. More so, the available evidence for tooth cleaning sticks and oral irrigators is limited and inconsistent.[35]

CONCLUSION

In conclusion, in order to improve oral health and increase access to dental care, there is a need to educate the populace on the benefits of maintaining good oral health; emphasizing the rationale for interdental cleaning as well as dental service utilization

Source of Support

Nil.

Conflict of Interest

None declared

REFERENCES

1. Loe H, Theilade E, Jensen S. Experimental gingivitis in man I. J Periodontal 1965; 36:177-187.
2. Schatzle M, Loe H, Lang NP, Burgin W, Anerud A, Boysen H. The clinical course of chronic periodontitis. J Clin Periodontol 2004; 31:1122-1127.
3. Axelsson P, Lindhe J. The effect of a preventive programme on dental plaque, gingivitis and caries in schoolchildren. Results after one and two years. J Clin Periodontol 1974; 1:126-138.

4. Marsh PD, Head DA, Devine DA. Ecological approaches to oral biofilms: control without killing. Caries Res 2015; (1): 46-54.
5. Kumar S, Tadakamadla J, Johnson NW. Effect of toothbrushing frequency on incidence and increment of dental caries: a systematic review and meta-analysis. J Dent Res 2016; 95(11):1230-1236.
6. Ethan NG, Lum PL. An overview of different Interdental cleaning aids and their effectiveness Dent J (Basel) 2019; 7(2):56.doi: 10.3390/dj7020056.
7. Quadri MFA, Shubayi MA, Hattan HA, Wafi SA, Jafer AH. Oral Hygiene practices among Saudi Arabian children and its relation to their dental caries status. Int J Dent 2018:3504245: PMC6091415
8. Loe H. Oral hygiene in the prevention of caries and periodontal disease. Int Dent J 2000; 50:129-139.
9. Claydon NC. Current concepts in toothbrush and Interdental cleaning. Periodontol 2000. 2008; 48:10-22.
10. Kinane DF. The role of Interdental cleaning in effective plaque control. Need for Interdental cleaning in primary and secondary prevention. In: Lang NP, Attstrom R, Loe H, editors. Proceedings of the European Workshop on Mechanical Plaque control. Berlin, Quintessence 1998:156-168.
11. Ledder RG, Letimer J, Forbes S, Penney JL, Streenivason PK, McBain AI. Visualization and quantification of the oral hygiene effects of brushing, dentrifice. use and brush wear using a tooth brushing simulator. Front Public Health 2019; 7: 91.
12. Jackson MA, Kellet M, Worthington HV and Clerelongh V. Comparison of interdental cleaning methods. A randomized controlled trial. J Periodontal 2006; 7:1421- 1429.
13. Peeran SA, Peeram SW, Sanabani FA, Aimakramani B, Etham EI, Kumar PGN. "Education Level" responsible for inequities in Oral Practices among 15–34–year–old. J Int Soc Prev Community Dent 2015; 5(2):120-124.
14. Zhou G, Sun C, Knoll N, Hamilton K and Schwarzer R. Self–efficacy planning and action control in an oral self–care intervention. Health Educ Res 2015; 30(40):671-681.
15. Umanah AU, Braimoh OB. Oral hygiene practices and factors influencing the choice of oral hygiene materials among undergraduate students at the University of Port Harcourt, Rivers State, Nigeria. J Dent Allied Sci 2017; 6:3-7.
16. Eigbodo JO, Etim SS. Trends in dental treatment of children at the University of Port Harcourt Teaching Hospital, Port Harcourt, Nigeria. Sahel Med J 2016; 19:220-226.
17. Gambhir RS, Brar P, Singh G, Sofat A, Kakar H. Utilization of dental care: Indian outlook. J Nat Sci Biol Med 2013; 4(2):292-297.
18. Nixon KC. An analysis of Interdental cleaning habits. Aust Dent J 1978; 23(5):389-391.
19. Dosumu EB, Lawal FB. Interdental cleaning: A cross-sectional survey of patients attending a tertiary health institution in Nigeria. Eur J Gen Dent 2015; 4:74-78.
20. Bommireddy VS, Pachava S, Ravoori S, Sanikomma S, Talluri D, Vinnakota NR. Socio-economic status, needs and utilization of dental services among rural adults in a primary health center area in southern India. J Int Oral Health 2014; 6(6):56-60.
21. Taiwo OA, Soyele OO, Ndubuizu GU. Pattern of utilization of dental services at Federal Medical Centre, Katsina, Northwest Nigeria. Sahel Med J 2014 ;17(3):108-111.
22. Widstrom E, Koposova N, Nordengen R, Bergdahl M, Eriksen H, Fabrkant E. Oral health care and dental treatment needs in the Brents region. Int J Circumpolar Health 2010; 69(5): 486-499.
23. Cosola S, Park YM, Giammarinaro E, Quercia D, Vecclieschi A, Marconcini S et al. Motivation of patients to use interdental tooth brushes for the domiciliary management of peri–implants health: different compliance according to the age. Dent Health Cure Res 2013; 4(2):doi: 10.4172/2470-0886.1000138.
24. Ivanovski K, Stefanovska E L, Ristoska S. Interdental cleaning at patients with periodontal disease. Stomatoloski Vjesnik 2013; 2(1):31-35.
25. Bourgeols D, Salias I, Liodra JC, Bravo M, Viennot S, Carrouel F. Efficacy of Interdental Calibrated brushes on bleeding reduction in adults: a 3-month randomized controlled clinical trial. Eur J Oral Sci 2016; 124(6):566-571.

26. Rosing CK, Daudt FARL, Festugatlo FE, Oppermann RV. Efficacy of interdental plaque control aids in periodontal maintenance patients: A comparative study. Oral Health Prev Dent 2006; 4:99-101.
27. Rosema NAM, Hennequin – Hoenderdos NL, Berchier CE, Slot DE, Lyle DM, vendor weijden GA. The effect of different interdental cleaning devices on gingival bleeding. J Int Acad Periodontol 2011; 13(1):2-10.
28. Soroye MO, Abah AA. Oral hygiene practices and use of interdental cleaning aids among dental students and interns in seven dental schools in Nigeria. LASU J Med Sci 2013; 2018;3(1):24-30.
29. Vashisth S, Gupta N, Bansal M, Rao NC. Utilization of services rendered in dental outreach programs in rural areas of Haryana. J Contemporary Clin Dent 2012; 3(2):S164–S166.
30. Kakatkar G, Bhat N, Nagarajappa R, Prasad V, Sharda A, Asawa K et al. Barriers to the Utilization of Dental Services in Udaipur, India. J Dent 2011; 8(2):81-89.
31. Rodelo JJV, Medina-Solis CE, Maupome G. Lamadrid-Figueroa H. Dental needs and socioeconomic status associated with utilization of dental services in the presence of dental pain: Case-control study in children. J Orofac Pain 2010; 24(3):279-286.
32. Gupta S, Mantri SS, Bhasin A. Knowledge and Attitude towards Prosthodontic Rehabilitation and Utilization of Dental Services by Central Indian Population of Jabalpur City, India. Ann Med Health Sci Res 2018; 8:12-15.
33. Pradeep Y, Chakravarty KK, Simhadri K, Ghenam A, Niadu GM, Vundavalli S. Gaps in need, demand and effective demand for dental care utilization among residents of Krishna district, Andhra Pradesh, India. J Int Soc Prevent Communit Dent 2016; 6:S116-S121.
34. dos Santos MBF, Montenegro FLB, Arcas SP, Hratsuka M, Consani RL, Marchini L. oral health status, hygiene habit and treatment need among elderly Brazilians; A cross–sectional study. World J Dent 2012; 3(1):22- 25.
35. Worthington HV, MacDonald L, Poklepovic Pericic T, Sambunjak D, Johnson TM, Imai P *et al*. Home use of interdental cleaning devices, in addition to toothbrushing, for preventing and controlling periodontal diseases and dental caries. Cochrane Database Syst Rev 2019; 10:4(4): CD012018