

Retrospective Evaluation of Scaling and Polishing Performed in a Nigerian Secondary Healthcare Setting

*Adesuwa A. EBOMWONYI, **Clement C. AZODO

*Department of Family Dentistry, Dental Centre, Central Hospital, Benin City, Edo State

**Department of Periodontics, University of Benin Teaching Hospital Benin City.

Correspondence

Dr. A. A. Ebomwonyi

Department of Family Dentistry,
Dental Centre, Central Hospital,
Benin City, Edo State

Email: aebomwonyi@gmail.com

Received: 20th August, 2020

Revised: 20th September, 2020

Accepted: 20th November, 2020

Citation: Ebomwonyi AA, Azodo CC. Retrospective evaluation of scaling and polishing performed in a Nigerian secondary healthcare setting. *Nig J Periodont Res* 2020; 1(1-2):28-35.

ABSTRACT

Objective: To determine the proportion of the patients who had scaling and polishing as part of preparation for other dental treatment and to determine the sociodemographic factors that predicted such treatment need. This study also assessed the oral hygiene status and caries experience among the studied patients.

Methods: The study is a retrospective review of dental records of patients who had scaling and polishing at the Dental Centre, Central hospital Benin City, over a 12-month period. Data included the demographic characteristics of the patients, presenting complaints, past dental visit, daily teeth cleaning frequency, smoking and alcohol intake, caries experience estimated with the DMFT and oral hygiene status estimated with simplified oral hygiene index and definitive treatment.

Results: A total of 322 patients were seen during the period with a mean age of 48.7 ± 16.6 years. About three-quarters (73.9%) of scaling were performed as preliminary care and 35.4% of the patients had poor oral hygiene. There was significant association between age, marital status and reason for presenting in the S & P clinic. Binary regression revealed age as the only predictors of scaling and polishing performed as preliminary care. About three-quarters (72.7%) of the patients reported cleaning their teeth once-daily teeth cleaning and about half (56.8%) of the patients were visiting dental clinic for the first time. The mean DMFT was 2.89 ± 3.22 . Tobacco smokers and patients with poor oral hygiene had significantly higher mean DMFT than their counterparts

Conclusion: Data from this study revealed that majority of scaling and polishing performed as preliminary care and only age emerged as a significant predictor of scaling and polishing performed as preliminary care. One third of patients had poor oral hygiene status. Tobacco use/alcohol consumption status and oral hygiene status were significantly associated with DMFT.

Keywords: DMFT, Oral hygiene practices, oral hygiene status, scaling and polishing.

Adesuwa A. Ebomwonyi

<https://orcid.org/0000-0003-3752-8960>

Clement C. Azodo

<https://orcid.org/0000-0003-0807-4154>

CLINICAL IMPLICATIONS

Dental caries risk assessment should be done for patients having scaling and polishing with a view to instituting preventive strategies that includes success oriented dietary counseling.

INTRODUCTION

Scaling is the removal of calcified and uncalcified deposits from the crown and root surfaces of teeth while polishing is the mechanical removal of any residual extrinsic stains and deposits using a rubber cup or bristle brush loaded with a prophylaxis paste.^{1,2} Scaling is classified as supragingival and

subgingival in terms of location, and as manual, sonic and ultrasonic in terms of main instruments used. Scaling and polishing is a non-surgical treatment performed in the dental clinic by dentists or dental care professionals as a preventive care for periodontal diseases, halitosis and dental caries and/ as a therapeutic care for periodontal disease.^{3,4} It is the most frequently performed non-surgical periodontal procedure.⁵ Scaling and polishing can be performed with or without adjunctive periodontal therapy such as antimicrobial agents, sulcular irrigation and root planning. Scaling and polishing is intended to be supplementary to oral self-care and it may be carried out during follow-up dental appointment.⁶ The elimination of plaque and plaque retentive factors like calculus from scaling and polishing usually translate to the reduction in gingivitis, periodontitis and halitosis.^{7,8} It is known to achieve these by the removal of the chronic irritants, by modifying the subgingival ecological environment and by suppressing inflammation.⁹⁻¹¹ It has been documented that gingivitis has been linked to cardiovascular disease predisposing individuals to heart disease, high blood pressure, stroke and diabetes thus scaling and polishing as well as toothbrushing is known to help to mitigate against these.¹² Scaling and polishing improves the quality of life of the recipient by giving an overall feeling of dental well-being and avoidance of disease. A study reported a higher level of oral cleanliness after scaling and polishing among the recipients.¹³ Periodontal procedures accounted for 9.2% of treatment procedure in Dental clinic with scaling and polishing forming the bulk (87.1%) of periodontal procedures.¹⁴ Scaling and polishing ranked third after tooth extraction and amalgam filling among dental treatment in a tertiary hospital in Katsina accounting for about one-fifth (17.6%) of dental treatments.¹⁵ Scaling and polishing was the most frequently performed procedure in Periodontology clinic accounting for 59.8% of all periodontal procedure and 62.1% of non-surgical procedures.⁵ The objective of the study was to determine the proportion of the patients who had scaling and polishing as part of preparation for other dental treatment and to determine the sociodemographic factors that may predict such treatment need. This study also assessed the oral hygiene status and caries experience among the studied patients in Central Hospital, Benin City Nigeria.

MATERIALS AND METHODS

This study is a retrospective review of dental records of patients that had scaling and polishing at the Dental Centre of Central hospital Benin City, over a 12-month period. Central hospital Benin city is a State-owned secondary facility rendering specialist care. Dental Centre runs as a multi-specialty dental healthcare setting. Data of interest include the demographic characteristics of the patients, presenting complaints, past dental visit, tooth cleaning frequency, smoking and alcohol intake, caries experience estimated with DMFT and oral hygiene status estimated with simplified oral hygiene index and care objective of the scaling and polishing performed were collated.

Occupation was used to group patients into three socioeconomic classes namely Class I –skilled workers e.g. professionals, teachers, civil servants; Class II – unskilled workers e.g. artisans and traders; and Class III – dependents e.g. housewives and students which has been used in dental health care setting.¹⁶ The reason for scaling and polishing was grouped into two, based on the mode of care it offered for presenting complaint. (1) Preliminary care when scaling and polishing performed did not offer definitive care for the presenting complaint. These patients were referred from other dental clinics with request to offer scaling and polishing as a pre-definitive treatment. (2) Therapeutic care when scaling and polishing performed offered essentially therapeutic care for the presenting complaint.

Oral hygiene status was assessed using the simplified oral hygiene index by Green and Vermillion.¹⁷ OH1- S Score of 0-1.2 was considered good oral hygiene, 1.3-3 considered as fair while 3.1-6.0 was considered as poor using the Greene and Vermillion set standard. Obtained data was subjected to descriptive statistics in the form of frequencies, percentages, cross-tabulations and regression statistics. The dependent variable for the binary regression statistics was reason for the scaling and polishing while the independent variables were demographic characteristics. Test for association was done with Chi-square, independent test and ANOVA. Statistical significance was set at $P < 0.05$. The protocol for this study was reviewed and approval granted by the Hospital Management Ethics and Research Committee.

RESULTS

A total of 322 patients comprising 150 males (46.6%) and 172 females (53.4%) with mean age 48.7 ± 16.6

years were seen during the study period. The majority of the patients were Christians (98.1%) and (70.5%) were married. About one-fifth of the patients were of social class III. About one-third (35.4%) of the patients had poor oral hygiene. About three-quarters (73.9%) of the patients had scaling and polishing performed as preliminary care (Table 1). Patients aged 51-60 years (83.1%), females (75.6%), Muslims (100.0%), ever married (76.9%), Social class II patients (78.3%) and those with good oral hygiene status (80.0%) had scaling and polishing performed more as preliminary care. However, it was only age that was significantly associated with reason for the scaling and polishing ($P=0.002$). The mean of the patients with scaling and polishing performed as preliminary care was 50.85 ± 18.70 years while the mean of the patients with scaling and polishing performed as therapeutic care was 42.77 ± 17.27 years

(Table 2). Patients aged 70 years and over were 13 times more likely to have had scaling and polishing performed as preliminary care than those aged 17-20 years. Females had 1.27 odds of having scaling and polishing performed as preliminary care than their male counterparts (Table 3). Above half (56.8%) of the patient had no previous dental visits and about three-quarters (73.6%) of the patients indulged in once-daily teeth cleaning. About one fifth (21.7%) of the participants indulged in alcohol consumption while only 4.0 smoked cigarettes (Table 4). Social class and daily teeth cleaning frequency were significantly associated with oral hygiene status as those in social class III and those that indulged in once-daily teeth cleaning had poorer oral hygiene status (Table 5). Tobacco/alcohol Habit and oral hygiene status were significantly associated with mean DMFT (Table 6).

Table 1: Demographic characteristics of the patients

Variable	Frequency (n)	Percent (%)
Sex		
Male	150	46.6
Female	172	53.4
Age (years)		
17-20	14	4.3
21-30	59	18.3
31-40	55	17.1
41-50	47	14.6
51-60	53	16.5
61-70	45	14.0
≥ 70	49	15.2
Religion		
Christianity	316	98.1
Islam	6	1.9
Marital status		
Single	88	27.3
Married	227	70.5
Widowed	7	2.2
Social class		
I	132	41.0
II	129	40.1
III	61	18.9
Oral hygiene status		
Good	10	3.1
Fair	198	61.5
Poor	114	35.4
Care objective for the scaling and polishing		
Therapeutic	84	26.1
Preliminary	238	73.9
Total	322	100.0

Table 4: Oral health practices of the patients

Variable	Frequency (n)	Percent (%)
Past Dental Visits		
None	183	56.8
One	57	17.7
Two	5	1.6
Three	1	0.3
More than three	76	23.6
Daily teeth cleaning frequency		
Once	237	73.6
Twice	82	25.5
Thrice	3	0.9
Habits		
No Alcohol/Smoking	245	76.1
Alcohol	64	19.9
Smoking	7	2.2
Alcohol & Smoking	6	1.9
Total	322	100.0

Table 2A: Distribution of demographic variables and Care objective for the scaling and polishing

Variable	Definitive n (%)	Therapeutic n (%)	P value
Sex			
Male	42 (28.0)	108 (72.0)	0.525
Female	42 (24.4)	130 (75.6)	
Age (years)			
17-20	9(64.3)	5(35.7)	0.002*
21-30	18(30.5)	41(69.5)	
31-40	18(32.7)	37(67.3)	
41-50	14(29.8)	33(70.2)	
51-60	9(16.9)	44(83.1)	
61-70	10(22.2)	35(77.8)	
≥ 70	9(64.3)	5(35.7)	
Mean age (years)	42.77±17.27	50.85±18.70	0.001*
Religion			
Christianity	84(26.6)	232(73.4)	0.346
Islam	0(0.0)	6(100.0)	
Marital status			
Single	30(34.1)	58(65.9)	0.045
Ever married	54(23.1)	180(76.9)	
Socioeconomic class			
I	38(28.8)	94(71.2)	0.333
II	28(21.7)	101(78.3)	
III	18(29.5)	43(70.5)	
Oral hygiene Status			0.531
Good	2 (20.0)	8 (80.0)	
Fair	48 (24.2)	150 (75.8)	
Poor	34 (29.8)	80 (70.2)	

Table 2B: Distribution of demographic variables and Care objective for the scaling and polishing

Variable	Therapeutic n (%)	Preliminary n (%)	P value
Past Dental Visits			
None	46 (25.1)	137 (74.9)	0.435
One	18 (31.6)	39 (68.4)	
Two	1 (20.0)	4 (80.0)	
Three	1 (100.0)	0 (0.0)	
More than three	18 (23.7)	58 (76.3)	
Daily teeth cleaning frequency			
Once	61(25.7)	176 (74.3)	0.950
Twice	22 (26.8)	60 (73.2)	
Thrice	1 (33.3)	2 (66.7)	
Habits			
No Alcohol/Smoking	60 (24.5)	185(75.5)	0.644
Alcohol	20 (31.3)	44 (68.7)	
Smoking	2 (28.6)	5 (71.4)	
Alcohol & Smoking	2 (33.3)	4 (66.7)	
Total	84 (26.1)	238 (73.9)	

Table 3: Adjusted Odds ratio for predictors of Scaling and polishing performed as preliminary care

Variables	Reference category	OR (95%CI)	P value
Age			
21-30	17-20	4.32(1.25-14.89)	0.021
31-40	17-20	5.44(1.36-21.77)	0.017
41-50	17-20	5.96(1.28-27.82)	0.023
51-60	17-20	15.88(3.21-78.48)	0.001
61-70	17-20	9.77(2.02-47.36)	0.005
≥ 70	17-20	17.29(3.38-88.43)	0.001
Sex			
Female	Male	1.27(0.74-2.16)	0.388
Marital status			
Ever Married	Single	0.74(0.31-1.8)	0.510

DISCUSSION

In this study female patients had more scaling and polishing done than their male counterpart. This finding differed from the report of Nigerian tertiary hospitals in Lagos by Umeizudike et al.⁵ in Maidiguri by Olaleye et al.¹⁴ and in Katsina by Taiwo et al.¹⁵ where males had more scaling and polishing than females. The gender disparity is ascribed to the fact that females visited dentist and sought more dental treatment than their male counterparts in Benin City where this study was done.¹⁸⁻²⁰ The majority of the patients were in the third and fourth decades of life which is in tandem with reported age pattern of Nigerian dental clinic attendees.^{15, 21,22} The third and fourth decades of life are more financially empowered individuals thus could afford out of pocket healthcare expenses in Nigeria which is confirmed as patients were predominantly of higher

socioeconomic class (class I and class II)²³. This is further explained by the fact that married people had more scaling and polishing services because of potential for double support financially.

More than one third of the patients had poor oral hygiene status which may be related to the suboptimal frequency of daily teeth cleaning as patient who indulged in once daily teeth cleaning significantly had poorer oral hygiene status in this study. The prevalence of poor oral hygiene was however higher than 19.1% reported by Olabisi et al.²⁴ in community-based outreach program in Port Harcourt and 29.4% reported by Opeodu et al.²¹ among periodontal patients. The patients in lower social class had significantly poorer oral hygiene status which may be related to poorer oral hygiene practices.

Table 5: Association between Demographic characteristics, Oral hygiene practices and Oral hygiene status

Variable	Good n (%)	Fair n (%)	Poor n (%)	P value
Sex				
Male	6 (4.0)	86 (57.3)	58 (38.7)	0.319
Female	4 (2.3)	112 (65.1)	56 (32.6)	
Age				
17-20	1 (7.1)	5 (35.7)	8 (57.1)	0.621
21-30	2 (3.4)	38 (64.4)	19 (32.2)	
31-40	2 (3.1)	31 (48.4)	22 (34.4)	
41-50	1 (2.1)	33 (70.2)	13 (27.7)	
51-60	2 (3.8)	35 (66.0)	16 (30.2)	
61-70	2 (4.4)	28 (62.2)	15 (33.3)	
≥ 70	0 (0.0)	28 (57.1)	21 (42.9)	
Religion				
Christianity	10 (3.2)	193 (61.1)	113 (35.8)	0.522
Islam	0 (0.0)	5 (83.3)	1 (16.7)	
Marital Status				
Single	4 (4.5)	55 (62.5)	29 (33.0)	0.588
Ever married	6 (2.6)	143 (61.1)	85 (36.3)	
Social Class				
I	1 (0.8)	86 (65.2)	45 (34.1)	0.013
II	8 (6.2)	82 (63.6)	39 (30.2)	
III	1 (1.6)	30 (49.2)	30 (49.2)	
Cleaning frequency				
Once	2 (0.8)	146 (61.6)	89 (37.6)	0.002
Twice	8 (9.8)	49 (59.8)	25 (30.5)	
Thrice	0 (0.0)	3 (100.0)	0 (0.0)	
Habit				
Nil Alcohol Smoking	8 (3.3)	154 (62.9)	83 (33.9)	0.299
Alcohol	2 (3.1)	35 (54.7)	27 (42.2)	
Smoking	0 (0.0)	3 (42.9)	4 (57.1)	
Alcohol Smoking	0 (0.0)	6 (100.0)	0 (0.0)	
Past Dental Visits				
None	5 (2.7)	121 (66.1)	57 (31.1)	0.061
One	0 (0.0)	33 (57.9)	24 (42.1)	
Two	1 (20.0)	1 (20.0)	3 (60.0)	
Three	0 (0.0)	1 (100.0)	0 (0.0)	
More than three	4 (5.3)	42 (55.3)	30 (39.5)	

The majority of scaling and polishing was performed as preliminary care which is in tandem with findings of a study by Opeodu et al.²¹ (71.6%) and Folake et al.²⁵ (66.1%) in a tertiary hospital in Ibadan, Nigeria with a record. This is mainly due to the fact that periodontal disease may be painless even at advanced stage²⁶ and Nigerians mainly visit dental clinic for care on the account of pain as only 5.7% were without symptom but attended for routine checkups cum professional tooth cleaning.²² The

contributory explanation for more scaling and polishing performed as preliminary care may be due to the fact that these patients had poorer oral hygiene in this study and also substantiated that periodontal health is a critical determinant of success of dental treatment. Patients who had scaling and polishing performed as preliminary care had significantly higher mean age than the patients who had scaling and polishing performed as definitive care.

Table 6: Mean DMFT among the patients

Variable	Mean DFMT	P value
Sex		
Male	3.12±3.63	0.223
Female	2.68±2.83	
Age (years)		
17-20	2.71±3.65	0.479
21-30	2.47±3.16	
31-40	2.96±3.86	
41-50	2.43±2.76	
51-60	3.02±2.96	
61-70	3.78±3.62	
≥ 70	2.82±2.67	
Religion		
Christianity	2.88±3.23	0.930
Islam	3.00±3.28	
Marital Status		
Single	2.63±3.26	0.376
Ever married	2.98±3.21	
Socioeconomic class		
I	2.53±3.02	0.052
II	2.84±2.91	
III	3.74±4.06	
Care objective		
Therapeutic	3.29±3.36	0.186
Preliminary	2.74±3.17	
Daily teeth cleaning frequency		
Once	3.13±3.51	0.073
Twice	2.20±2.15	
Thrice	2.00±0.00	
Habit		
No Alcohol/Smoking	2.53±3.29	0.005
Alcohol	4.03±2.67	
Smoking	4.57±4.28	
Alcohol&Smoking	3.00 ±1.55	
Past Dental Visits		
None	2.71±3.16	0.180
One	3.68±3.22	
Two	0.8±1.79	
Three	4±0.00	
Several	2.83±3.38	
Oral hygiene Status		
Good	1.30±2.11	<0.0001
Fair	2.02±1.99	
Poor	4.53±4.25	

Overall Mean DMFT: 2.89±3.22

Age emerged as the only significant predictor of scaling and polishing performed as preliminary care in this study. Patients aged 70 year and over were 13 times more likely to be to have had scaling and polishing performed as preliminary care than those

aged 17-20 years. This may be intricately related to reasons and pattern of dental visit in Nigeria. More than half of the patients had no previous dental visit which may be related to the preference of curative dental visits to preventive dental visits among

Nigerians²⁷ and also a pointer to the need to understand the barriers to utilization of dental services early in life.

The mean DMFT score recorded in this study is higher than 2.2 reported by Azodo and Ogordi²⁷ in a tertiary hospital in Benin City but lower than 3.57 reported by Omitola and Arigbede²⁸ among patients in a tertiary hospital in Port Harcourt. This may be explained by the geographical and regional difference in dental caries in Nigeria with it being higher in urban than suburban and rural areas. The fact that patients who had scaling and polishing performed as therapeutic care had higher mean DMFT scores emphasizes sustained effort for periodontologists to screen patients for risk factors for dental caries, counsel them in order to facilitate behavioral changes which can lead to reduction and prevention of dental caries.

Although the prevalence of tobacco smoking among the patients was found to be low which tallied with the value (4.0%) reported by Ehizele et al.²⁹ in the tertiary health facility in Benin City, tobacco smoking was found to be a significant contributor to higher mean DMFT scores which may be related to the neglect of oral hygiene alongside general hygiene which is well documented in smokers. It was also seen that smokers had poorer oral hygiene status in this study. Plaque is the aetiological agent of dental caries and this explained why patients with poor oral hygiene status in this study had higher DMFT scores

CONCLUSION

Data from this study revealed that majority of scaling and polishing performed as preliminary care and only age emerged as a significant predictor of scaling and polishing performed as preliminary care. One third of the total patients that had scaling and polishing had poor oral hygiene status. Tobacco use/alcohol consumption status and oral hygiene status were significantly associated with DMFT.

Source of Support

No external funding received.

Conflict of Interest

None declared

REFERENCES

1. Jones CL, Milsom KM, Ratcliffe P, Wyllie A, Macfarlane TV, Tickle M. Clinical outcomes of single-visit oral prophylaxis: a practice-based

- randomised controlled trial. *BMC Oral Health* 2011; 11:35. doi: 10.1186/1472-6831-11-35.
2. Beirne P, Worthington HV, Clarkson JE. Routine scale and polish for periodontal health in adults. *Cochrane Database Syst Rev* 2018; 12(12):CD004625.doi:10.1002/14651858.CD004625.pub5.
3. Becker W, Berg L, Becker BE. The long-term evaluation of periodontal treatment and maintenance in 95 patients. *Int J Periodontics Restorative Dent* 1984; 4(2):55-71.
4. Axelsson P, Lindhe J. The significance of maintenance care in the treatment of periodontal disease. *J Clin Periodontol* 1981; 8:281-294.
5. Umeizudike KA, Ayanbadejo PO, Savage KO, Taiwo OA. Pattern of periodontal treatments performed at the periodontology clinic of the Lagos University Teaching Hospital: 22 months review. *Nig Q J Hosp Med* 2012; 22(1):7-13.
6. Riley P, Worthington HV, Clarkson JE, Beirne PV. Recall intervals for oral health in primary care patients. *Cochrane Database Syst Rev* 2013; (12):CD004346.doi:10.1002/14651858.CD004346.pub4.
7. Darby ML. *Dental Hygiene: Theory and Practice*. Missouri: Saunders 2010.
8. Aylikçi, Bahadır & Colak, Hakan. Halitosis: From diagnosis to management. *J Nat Sci Biol Med* 2103; 4. 14-23.
9. Tunkel J, Heinecke A, Flemmig, TF. A systematic review of efficacy of machine-driven and manual sub gingival debridement in the treatment of chronic periodontitis. *J Clin Periodontol* 2002; 29 (Suppl. 3):72-81.
10. Van der Weijden, G. A. & Timmerman, M. F. A systematic review on the clinical efficacy of subgingival debridement in the treatment of chronic periodontitis. *J Clin Periodontol* 2002; 29 (Suppl. 3):55-71.
11. Choo A, Delac DM, Messer LB. Oral hygiene measures and promotion: review and considerations. *Aust Dent J* 2001; 46:166-173
12. Gerhard Schmalz, Dirk Ziebolz, Changing the Focus to the Whole Patient instead of One Oral Disease: The Concept of Individualized Prevention. *Advanc Prev Med* 2020, (1-11).
13. Lamont T, Worthington HV, Clarkson JE, Beirne PV. Routine scale and polish for periodontal health in adults. *Cochrane Database Syst Rev* 2018;12(12):CD004625.doi:10.1002/14651858.CD004625.

14. Olaleye AO, Suleiman IK, Solomon S. Pattern of dental treatment in patients attending the dental centre University of Maiduguri Teaching Hospital, Maiduguri Nigeria. *Bo Med J* 2013; 10(1):12-19.
15. Taiwo OA, Soyele OO, Ndubuizu GU. Pattern of utilization of dental services at Federal Medical Centre, Katsina, Northwest Nigeria. *Sahel Med J* 2014; 17:108-111
16. Esan TA, Olusile AO, Akeredolu PA, Esan AO. Socio-demographic factors and edentulism: the Nigerian experience. *BMC Oral Health* 2004; 4(1):3.doi:10.1186/1472-6831-4-3.
17. Greene JC, Vermillion JR. The simplified oral hygiene index. *J Am Dent Assoc.* 1964; 68:7-13.
18. Saheeb BD, Sede M A. Reasons and pattern of tooth mortality in a Nigerian urban teaching hospital. *Ann Afr Med* 2013; 12:110-4.
19. Ogbabor OG, Azodo CC. Reasons for seeking dental healthcare services in a Nigerian missionary hospital. *Sahel Med J* 2016; 19:38-43
20. Ibhawoh LO, Enabulele JE. Retrospective analysis of reasons for conventional root canal treatment of permanent teeth in a Nigerian tertiary hospital. *Nig J Dent Sci* 2019; 2(1&2):13-21.
21. Opeodu IO, Arowojolu MO, Gbadebo SO, Ibiyemi TS. An audit of pattern of patients' presentation at the periodontics clinic of the university college hospital, Ibadan. *Ann Ib Postgrad Med* 2009; 7(1):16-20.
22. Akaji EA, Chukwuneke FN, Okeke UF. Attendance pattern amongst patients at the Dental Clinic of the University of Nigeria Teaching Hospital, Enugu, Nigeria. *Niger J Med* 2012; 21(1):74-77.
23. Onwujekwe OE, Uzochukwu BS, Obikeze EN, Okoronkwo I, Ochonma OG, Onoka CA, Madubuko G, Okoli C. Investigating determinants of out-of-pocket spending and strategies for coping with payments for healthcare in southeast Nigeria. *BMC Health Serv Res* 2010; 10:67. doi: 10.1186/1472-6963-10-67.
24. Olabisi AA, Udo UA, Ehimen UG, Bashiru BO, Gbenga OO, Adeniyi AO. Prevalence of dental caries and oral hygiene status of a screened population in Port Harcourt, Rivers State, Nigeria. *J Int Soc Prev Community Dent* 2015; 5(1):59-63.
25. Lawal FB, Arowojolu MO. Sociodemographic Status of Patients Seeking Routine Scaling and Polishing in a Resource Challenged Environment. *West Afr J Med* 2015; 34(3):193-196.
26. Elhassan AT, Alfakry H, Peeran SW. Reasons to seek periodontal treatment in a Libyan community. *Dent Med Res* 2017; 5:38-42.
27. Azodo CC, Ogordi PU. Dietary behavior, dental caries knowledge and experiences among dental patients. *Nig J Res Dent* 2017; 2(2):65-72.
28. Omitola OG, Arigbede AO. Prevalence of dental caries among adult patients attending a tertiary dental institution in south-south region of Nigeria. *Port Harcourt Med J* 2012; 6:52-58.
29. Ehizele AO, CC Azodo, Ojehanon PI, Akhionbare O, Umoh AO, Adeghe HA. Prevalence of tobacco use among dental patients and their knowledge of its health effects. *Niger J Clin Pract* 2012; 15:270-275.

INSTRUCTIONS TO AUTHORS

Nigerian Journal of Periodontal Research (NJPR) will publish two issues, annually: in JANUARY-JUNE and JULY-DECEMBER. NJPR accepts reports of original research articles, special review articles, histories and reports of rare and special cases, new sciences, discoveries and innovations in surgical techniques relevant to the study and practice of Periodontology.

Submission of an article for consideration for publication will be held to imply that it has neither been published nor is it under consideration for publication elsewhere. The editor reserves the right to edit manuscripts to ensure brevity and clarity of expression. The publishers also acquire all rights to the work upon acceptance of the manuscript by the Journal. Permission for reproduction must therefore be obtained by application in writing to the Editor-in-Chief. It is assumed that the author has considered ALL ethical aspects of his/her research and taken cognisance of the guidelines of the Helsinki declaration as revised in 1975 or the ethical guidelines of the institution(s) in which the work was done.

Following completion of the peer review process on every article, a decision of acceptance as submitted, acceptance with minor revision, acceptance with major revision or rejection will be communicated. Preparation of Manuscripts It is required that manuscripts be prepared and referenced with the Vancouver system for biomedical manuscripts published by the International Committee of Medical Journal Editors; "Uniform requirements for manuscripts submitted to biomedical journals" Br. Med. J. 1982; 284: 1766-1770.

Manuscripts must be submitted in electronic form, using Microsoft word format Times New Roman on font size 12 via email of the email account of the corresponding author. Contributions must be double-spaced and the recommended outline for the organization of articles is: **Title page, abstract, clinical implication(s) introduction, materials and methods, results, discussion, conclusions and recommendations (if any), acknowledgements, references, tables and legends.** Each manuscript component should begin on a new page.

Title Page: The title page should have the following: The title of the article which should be concise but informative; A short running headline of no more

than seven words placed at foot of the title page and identified; A- Full names of each author (Surname last and in Uppercase letters; ORCID id). Name(s) of department(s)/unit(s) and address of the institution in which the work(s) was/were done; Name and address of author responsible for correspondence about the manuscript.

Abstract and Key Words: The second page should have a structured abstract of no more than 250 words. Below the abstract, identify and provide three to ten key words. Acknowledgements: It is the responsibility of author(s) to obtain permission and approval of the wording from anyone acknowledged by name as readers may infer his/her endorsement of the data and conclusions. References Number: references consecutively in the order in which they are first mentioned in the text. Identify references in the text, tables and legends by Arabic numerals (in superscript). Abstracts, "Unpublished observations", "personal communications" and "unaccepted papers" may not be used as references. However, references to written, not verbal communications may be inserted (in superscript). Examples of correct forms of references are given below: Journals: Standard Journal Article. (List all authors when seven or less; when ten or more, list only the first seven and add et. al.) Nwhator S, Opeodu O, Ayanbadejo P, Umeizudike K, Olamijulo J, Alade G, Agbelusi G et al. Could periodontitis affect time to conception? Ann Med Health Sci Res. 2014; 4(5):817-822. Corporate Author: The Royal Marsden Hospital Bone-Marrow Transplantation Team: Failure of syngeneic bonemarrow graft without preconditioning in post-hepatitis aplasia. Lancet 1977; 2: 242-244. Personal Author(s): Lisen, HN: Immunology: An introduction to molecular and cellular principles of the immune response. 5th ed. New York, Harper & Row, 1974, 406 pp. Chapter in a Book: Weinstein L, Swartz, MN.: Pathogenic properties of invading micro-organisms. In: Sodeman W. A. Jr., Sodeman, WA. eds. Pathologic physiology: mechanism of disease. Philadelphia, W. B. Saunders, 1974, 457-472. Dissertation or Thesis: Umoh, AO: Correlation of maternal periodontal status with low birth weight and pre-term deliveries, 2011, 45 pp. Tables: Type each table on a separate page. Number the tables consecutively and supply a brief title for each.

Figures and Illustrations: These must be professionally drawn and or photographed. If photographs of persons are used, either the subjects must not be identifiable or their pictures must be accompanied by written permission to use the photograph. Only one per page is permissible.

Legends for Illustration: Type legends of illustrations double-spaced, starting on a separate page, with Arabic numerals corresponding to illustrations. Explain internal scale and identify method of staining in photomicrographs.

Proof-reading: Proofs will be sent to authors and must be read carefully and returned immediately. The journal must be reimbursed for unusually

extensive or late corrections or revisions due to the authors' negligence. Reprints: Authors of original articles will receive one complimentary copy of the issue and a soft copy in pdf format. Please submit soft copies of manuscripts to: The Editor-in-Chief, Nigerian Journal of Periodontal Research, Department of Periodontology and Community Dentistry, University of Ibadan, Nigeria. Email: editornjprnjpr@gmail.com.

Publication fee: Accepted article will attract a publication of 20,000naira only for local authors and 150 dollars for international authors. Additional fees will apply to coloured pictures.