

Attitude and Behavior to Oral Health of 456 Patients Who Presented for Tooth Extraction at 2 Health Facilities in Southwestern Nigeria

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Olalere Omoyosola Gbolahan, BChD, FWACS¹,
Abiodun Olubayo Fasola, BDS, MSc, FWACS¹,
and Timothy Olukunle Aladelusi, BDS, MSc, FWACS¹

Abstract

Introduction: Tooth loss can indicate the population's oral health situation; majority of patients presenting for tooth extraction have poor oral health behavior and dental service utilization. Understanding the factors responsible for the poor attitude may help in designing targeted intervention to improve their oral health behavior. This study aims to find out the effects of dental health attitude and behavior on tooth mortality in a cohort of adults attending the oral surgery clinic for tooth extraction in 2 health facilities in southwestern Nigeria. **Patients and Method:** Cross-sectional study of consecutive adult patients who presented at the oral surgery clinic for tooth extraction. Clinical and demographic data, oral health habits, and pattern of previous dental clinic attendance were collected. Data analysis was done using SPSS version 19.0. Variables were subjected to univariate and multivariate logistic regression to evaluate factors influencing dental habit and dental service utilization. **Results:** The study comprised a total of 453 respondents, consisting of 239 nonattenders, 196 in-trouble attenders, and 18 regular attenders, with majority (59.4%) of them being low earners or not gainfully employed. Majority (64.8%) of the in-trouble attenders had attained tertiary education. Attendance pattern had no influence on the number of extractions needed. **Conclusion:** Despite high educational attainment and availability of dental services, most patients presenting for extraction have poor oral health habit and are problem-oriented attenders. Socioeconomic disparities and poor dental habits appear to be part of the major factors responsible for poor dental behavior among the study subjects.

Keywords

oral surgery clinic, dental service utilization, oral health attitude, oral health behavior

Introduction

Despite all the efforts of both governmental and nongovernmental organizations to improve oral health, oral disease burden is still high globally, especially in developing countries. Among the major barriers that have been consistently echoed by several authors as militating against the desired improvement in oral health is individual attitude and oral health behavior (1,2).

Health attitude has been defined as “opinions, feelings, and associated beliefs toward individual health,” while health behavior refers to “behavior patterns, actions, and habits that relate to health maintenance, restoration, and improvement” (3). Health behaviors can be broadly classified into health-enhancing or health-impairing behaviors. It

has been established that behavior and behavioral modification can be used to influence health outcomes.

Baxter (4) examined the relationship between health behaviors and health outcomes and demonstrated its role in morbidity and mortality. Connor and Norman stated that significant mortality is caused by behavior of individual, but

¹ Department of Oral and Maxillofacial Surgery, University of Ibadan/ University College Hospital, Ibadan, Oyo State, Nigeria

Corresponding Author:

Olalere Omoyosola Gbolahan, Department of Oral and Maxillofacial Surgery, University of Ibadan/University College Hospital, Ibadan, Oyo State, Nigeria.
Email: gbolahanlere@yahoo.com



such behaviors are modifiable and this change can influence health outcomes (5). They reported that health-improving behaviors are associated with low morbidity and high subsequent long-term survival (5).

Patients utilizing dental services can be grouped into non-attenders, problem-oriented attenders, and regular attenders (6). Regular dental visit has been shown to be one of the effective ways of maintaining good oral health (7-9). Attitude to routine use of dental services is poor globally, but worse in developing countries (1,10).

Studies have demonstrated poor oral health to be associated with problem-oriented dental service use (11,12), and Jamieson and Thomson (10) in a prospective cohort study in New Zealand reported a definite association between long-term routine dental services use and better oral health outcomes. The impact of utilization of dental services on oral health has been examined in several dental specialties (1,2,9), but to the best of our knowledge, none has been reported from an oral surgery clinic.

Tooth mortality is a reflection of cumulative effect of past disease and practice pattern (13). Pattern of tooth loss has been generally regarded as one of the most important measures needed for assessing the standards, availability, and utilization of both curative and preventive dental care in a given population (14). This study aims to find out the effects of dental health attitude and behavior on tooth mortality in a cohort of adults attending the surgery clinic for extraction in 2 health facilities in southwestern Nigeria.

Patients and Methods

This is a cross-sectional study conducted in a cohort of adult patients who presented for tooth extraction at the University College Hospital (UCH), dental clinic Ibadan and Oyo state Government dental center, Ibadan between December 2014 and August 2015. The study data were collected using a semistructured questionnaire after obtaining informed consent for participation in the study and the dental extraction procedure. Study participants included 446 consecutive adult patients (16 years and above) who had an extraction of one or more permanent teeth at any of the study centers during the study period. Patients who declined to participate in the study were excluded. The data collected included the age, gender, socioeconomic status, highest educational attainment, type and number of teeth removed, indications for tooth extraction, oral hygiene practice, and pattern of previous dental clinic attendance. The ethical approval for the study was obtained from the University of Ibadan UI/UCH Ethical Review Committee (UI/EC/17/0568). For the purpose of this study, pattern of dental clinic attendance (visiting status) was grouped into 3: regular attenders, in-trouble attenders, and nonattenders (adapted from Taiwo and Noah, 2006) using the following criteria (6):

- a) Time interval since last visit.
- b) Purpose of visit; whether it was solely for maintenance of dental health or cure of symptoms.
- c) Intention to visit the dental clinic again.

An attender whose last visit was within the last 1 year, whose purpose of visit was solely to maintain dental health, and who intends to visit the dental clinic again was accepted as a regular attender. Visits made for the purpose of check-ups, fluoride application against caries, and professional cleaning (scaling and polishing) were regarded as health maintenance purposes.

An attender whose last visit was more than a year was regarded as an in-trouble attender. An attender even though the visit was within 1 year was regarded as in-trouble if the purpose of his visit was for cure of symptoms and had no intention of visiting the dental clinic again. Attenders who have never visited the dental clinic before were classified as nonattenders.

All the extraction procedures were done aseptically under local anesthesia. Tooth delivery was by intra-alveolar forceps extraction for fully erupted teeth and transalveolar extraction (surgical disimpaction) for impacted teeth.

Statistical Analysis

Data entry and analysis were done using the SPSS for Windows Inc (Chicago, Illinois) version 19.0. Results were presented as frequency tables and diagrams. Variables were subjected to univariate and multivariate logistic regression to evaluate their relationship with tooth extraction and dental habit. Categorical variables were tested using the Pearson χ^2 test to examine the relationship between tooth loss and specific patients' characteristics as well as various factors that may affect utilization of dental services. Univariate and multivariate logistic regression analyses were used to identify factors affecting dental habit and dental service utilization. Variables achieving a *P* value of $\leq .05$ are considered statistically significant.

Results

A total of 453 respondents, consisting of 212 males (46.6%) and 241 females (53.2%), made up the study participants. There were 239 nonattenders, 196 in-trouble attenders, and only 18 regular attenders (Figure 1). Majority of the participants in each category (81.6%, 80.6%, and 72.2%, respectively) were resident in Ibadan. The age group 31 to 50 years accounted for 40.2% of the patients, while those over 70 years were less than 10% of the participants. One hundred twenty-seven patients who had attained tertiary education formed the majority (64.8%) of the in-trouble attenders, and this was statistically significant (*P* = .02). However, 59.4% of the participants were low earners or were not in any gainful employment (Table 1).

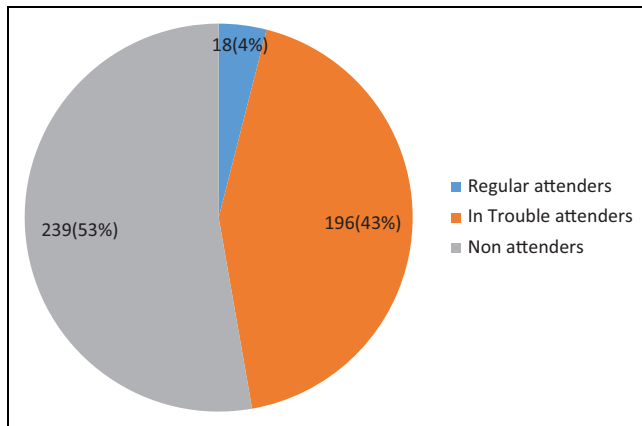


Figure 1. Pattern of attendance.

Four hundred two (88.7%) of the participants cleaned their teeth with toothbrush and tooth paste, while only 7 participants used chewing stick alone as teeth cleaning aid. Majority of the participants (79.2%) cleaned their teeth once daily, while 19% cleaned their teeth more than once daily; this was statistically significant ($P = .001$). In all, 71.7% of participants took carbonated drinks occasionally, while 8.8% took more than once a day, and 7.3% do not take carbonated drinks at all (Table 2). Dental caries and its sequelae were the commonest reason for visiting the dental clinic in all attenders. Five (28%) out of 18 regular attendees required multiple extractions (Table 3). Caries was the commonest primary presentation and indication for extraction (Figures 2 and 3).

Discussion

Published works have shown that the routine use of dental services is poor globally, although worse in developing nations, and that most patients present at the dental clinic majorly for treatment of symptoms (1,2,10,15). Majority of our respondents were making their first contact with a dental clinic at the time of the extraction, which corroborates the findings from previous studies that majority of dental service users are problem oriented (1,8,10). Adegbenbo (2) in a study in Ibadan, southwestern Nigeria, reported that only 9% of household had utilized dental services the previous year. In another study in Nigeria, Taiwo and Noah reported 55.6% nonattenders, 33.3% in-trouble attenders, and 11.1% regular attenders among their study participants (6). In the present study, only 3.9% of our study participants were regular attenders, the remaining were either nonattenders (52.8%) or in-trouble attenders (43.3%). The lower percentage of regular attenders in this study could be due to selection bias this is because this study was carried out in oral surgery clinic among patients presenting for mainly for extraction of teeth unlike the other studies that were done among patients attending the dental clinic for various reasons. Most of the regular attenders are likely to have other forms of treatments apart from extraction. This is corroborated by earlier studies that reported more restorative and periodontal treatment in regular attenders than infrequent attenders among which a high rate of tooth loss was common (8,16,17).

Less than 10% of our study participants belong to the age group of 70 years and above in agreement with a previous study that has reported an inverse relationship between age and dental service utilization (18) but in contrast to the

Table 1. Distribution of Study Subjects Based on Status of Attendance and Age and Socioeconomic Standing.

Dental Visiting Status	Regular Attender, n (%)	In-Trouble Attender, n (%)	Nonattender, n (%)	P Value
Gender				
Male	11 (5.19)	86 (40.57)	115 (54.25)	.314
Female	7 (2.90)	110 (45.64)	124 (51.45)	
Residence				
Inner Ibadan city	13 (3.55)	158 (43.17)	195 (53.28)	.536
Outer Ibadan city	4 (5.00)	29 (40.00)	39 (55.00)	
Outside Ibadan	1 (6.67)	9 (60.00)	5 (33.33)	
Age group				
16-30	4 (3.48)	40 (34.78)	71 (61.74)	.091
31-50	4 (2.20)	86 (47.25)	92 (50.55)	
51-70	6 (5.31)	49 (43.36)	58 (51.33)	
70 and above	4 (9.30)	21 (48.84)	18 (41.86)	
Educational level				
No formal education	1 (7.14)	6 (42.86)	7 (50)	.020
Primary school education	4 (12.12)	12 (36.37)	17 (51.51)	
Secondary school education	4 (2.74)	51 (34.93)	91 (62.33)	
Higher education	9 (5.63)	127 (79.37)	24 (15.00)	
Occupational earning level				
High earner	6 (4.48)	70 (52.24)	58 (43.28)	.058
Intermediate earner	4 (8.00)	18 (36.00)	28 (56.00)	
Low earner	5 (3.94)	45 (35.43)	77 (60.63)	
No gainful employment	3 (2.11)	63 (44.37)	76 (53.52)	

Table 2. Distribution of Study Subjects Based on Oral Hygiene Measures.

Dental Visiting Status	Regular Attender, n (%)	In-Trouble Attender, n (%)	Nonattender, n (%)	P Value
Cleaning aid				
Tooth brush and tooth paste	17 (4.23)	172 (42.80)	213 (52.97)	.913
Chewing stick	0 (0)	3 (42.86)	4 (57.14)	
Chewing brush, tooth paste + chewing stick	1 (2.27)	21 (47.73)	22 (50)	
Frequency of tooth brushing				
Twice or more daily	7 (8.14)	50 (58.14)	29 (33.72)	.000
Once daily	9 (2.51)	143 (39.83)	207 (57.66)	
Irregular sometimes less than once daily	2 (25.00)	3 (37.50)	3 (37.50)	
Consumption of carbonated drinks, sweetened beverages, and energy drinks				
Once a day	3 (5.45)	22 (40.00)	30 (54.55)	.612
More than once a day	2 (5.00)	20 (50.00)	18 (45.00)	
Occasionally	10 (3.08)	140 (43.07)	175 (53.85)	
Does not take	3 (9.09)	14 (42.42)	16 (48.49)	

reported use of general health-care services (19,20). The low percentage of elderly respondents found in this study could be due to lower life expectancy in Nigeria. Average life expectancy in Nigeria is 56.8 years (21), creating a situation in which fewer people above the age of 70 years are seen among the populace. As previously documented, other possible factors limiting the use of dental services by the elderly include functional barriers, immobility, presence of other chronic diseases, disability, and limited financial resources (20).

Caries (61.4%) and periodontal disease (19.2%) accounted for the highest cause of extraction in agreement with previous reports (22,23). Caries and periodontal disease are largely preventable causes of extraction when diagnosed at the early (asymptomatic) stage at regular attendance. Unfortunately, in-trouble attenders and nonattenders tend to attend late and only when there is pain at which stage other treatment options apart from extraction are either not appealing or not affordable (22). This is reflected in this study where pain was the commonest complaint. It is therefore not surprising that majority of these patients had extractions in the oral surgery clinic.

Distance and availability of health facility have been documented as one of the barriers to seeking treatment (24). Although this study did not document the distance patients had to travel to reach the health facility, the finding in this study does not suggest distance to be a major factor

Table 3. Distribution of Study Subjects Based on Dental Health-Care Usage.

Dental Visiting Status	Regular Attender	In-Trouble Attender	Nonattender	P Value
Indications for extraction				
Dental caries and its sequelae	8	111	159	.108
Periodontal disease	5	43	39	
Endo-perio lesions	1	3	4	
Prosthetic reasons	0	2	0	
Impaction/eruption problems	1	11	11	
Failed root canal treatment	0	8	0	
Trauma	3	15	19	
Supernumerary/supplemental teeth	0	1	4	
Orthodontic reasons	0	2	1	
Patients request	0	0	2	
Pattern of extraction				
Single extraction	13	177	212	.067
Multiple extraction	5	19	27	
Previous dental visit				
First dental visit	0	4	235	.001
Has had dental visit before	18	196	235	
Willingness to visit the dental clinic again				
Yes 6 months or less	16	103	70	.001
Yes 1 year or less	2	10	11	
Not sure	0	59	139	
Never	0	22	15	

responsible for the poor attendance pattern as comparable percentages of all the categories of attenders live in Ibadan. Ibadan is a cosmopolitan city and has both government and private dental facilities located in different parts of the city such that they are accessible to the populace. This finding is in agreement with the studies of Adegbelembo (2) and Goel et al (25) that reported poor utilization of dental services despite availability and accessibility; this was attributed to poor oral health attitudes. Therefore, other factors apart from distance may be responsible for the poor health-seeking behavior among our study participants.

High education levels have been previously reported to be associated with better health-seeking behavior (26,27); however, we found no positive correlation between oral health seeking behavior and level of education among our study participants. Majority of in-trouble attenders had higher levels of education. Education is expected to improve health-seeking behavior on the premise that there will be better access to information, which will improve their knowledge about health, thereby motivating them to make a change.

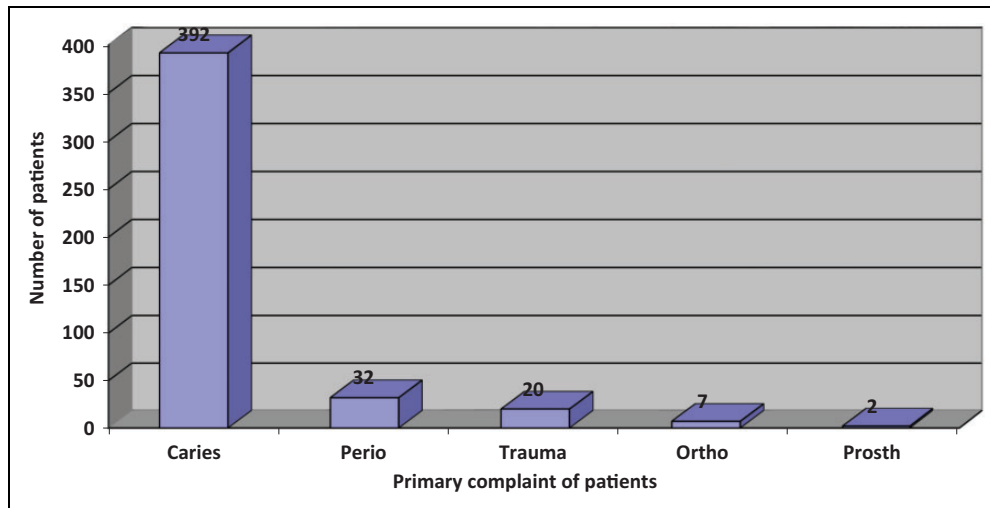


Figure 2. Primary complaint of patients who presented for dental extraction.

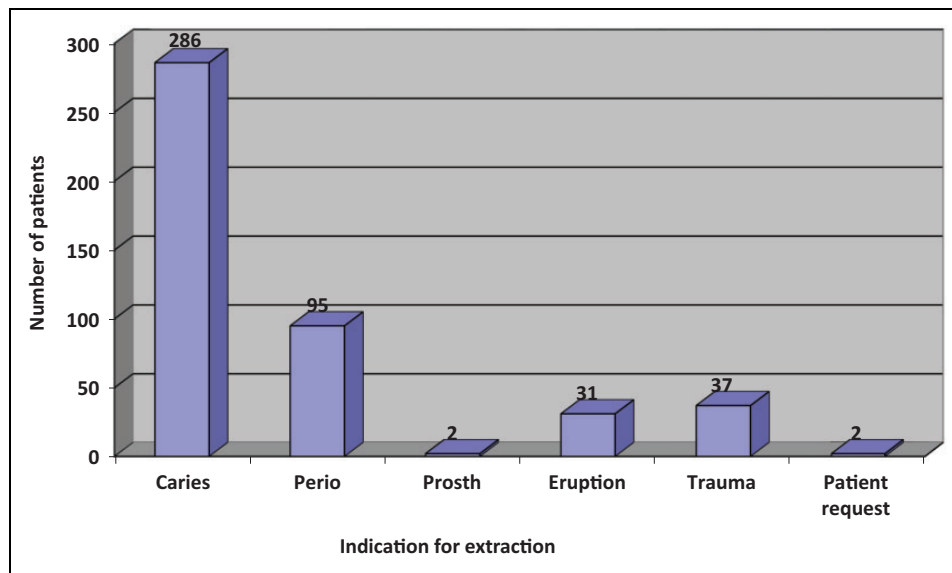


Figure 3. Indications for extraction in 453 patients.

However, evidence have also shown that giving information alone may not lead to measurable change in behavior since a complex interaction between several factors may determine health-seeking behavior (28). As opined by Kakatka et al (29), successful motivation requires more than information but also paying attention to individual reasons restricting behavior. In Nigeria, there are so many graduates without any gainful employment (21); this raises the possibility of financial restrictions to positive health-seeking behavior influenced by education.

Majority of our participants were low-income earners or were not in any gainful employment; this agrees with the study of Ahmed et al that reported socioeconomic indicators as the single most pervasive determinant of health-seeking behavior (19). A similar study in Nigeria suggested that their study population placed more priority on farming than oral

health (30). Previous studies have documented socioeconomic disadvantage as a barrier to oral care, thereby contributing to social discrepancies in oral health status (31,32). In a society with high levels of poverty and where oral health is considered not life threatening, people use their resources for other apparently more pressing needs until the dental symptoms become unbearable. Helman surmised this behavior by concluding that, “people do not consult a doctor when they are sick simply because they cannot afford it” (33).

This study did not look at oral health knowledge; however, from the result obtained in the oral health habit, it may be inferred that oral health knowledge was deficient among majority of our study participants. This agrees with Gilbert et al who reported more preventive behaviors among regular attenders than nonattenders (16). Although majority of the participants use toothbrush, only few of them brush more

than once daily. Oral health preventive studies have unequivocally demonstrated the beneficial effect of twice daily toothbrushing on improving oral health (34–36); this is one of the main oral health information given to patients during dental consultations. This type of information that may lead to improved knowledge and possible behavioral change is more likely to be achieved through routine dental visit. Reinforcement of information at routine dental visit can contribute to change in habit and behavior that ensures sustainability. Preventive oral health practices like twice-daily toothbrushing were poor among our participants as only 19% brush their teeth more than once daily in agreement with the study of Gilbert et al (16). Information does not always lead to change of habit; it is possible that some regular attenders still have poor oral health practices despite regular exposure to oral health education. Therefore, they become candidates for tooth extraction and form part of the study participants contributing to the high percentage of poor preventive practices noted.

Contrary to previous studies that reported less extractions in regular attenders (8,17), we did not find any significant difference in the number of extractions needed between the different categories of attenders. This could however be due to the fact that only relatively few regular attenders were involved in this study. Another possibility for the observed trend in the present study is that some of the indications for multiple extractions among regular attenders were for aesthetic reasons like orthodontic and prosthetic reasons and not necessarily because of pathology in the oral tissues.

Regular attendance has the potential for preventing tooth loss by improving oral health. Each dental attendance and consultation serves as a source of reinforcement of good oral practices until it becomes a habit. Even in people who previously had some poor oral attitude and behavior, the regular reinforcement at each routine visit may help to contribute to change in habit and behavior that ensures sustainability.

Conclusion

The result obtained in this study suggests that majority of the patients who present for extraction of teeth had poor oral health habits and were problem oriented, despite their high educational attainment and availability of dental services. Socioeconomic disparities and poor dental habits appear to be part of the major factors responsible for poor dental behavior among the study subjects.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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References

1. Opeodu OI, Dosumu EB, Arowojolu MO. Dental health service utilisation by resident doctors/medical officers in the University College Hospital, Ibadan, Oyo State, Nigeria. *Afr J Med Sci.* 2012;41:277-82.
2. Adegbenbo AO. Household utilization of dental services in Ibadan Nigeria. *Community Dent Oral Epidemiol.* 1994;22:338-9.
3. Gochmann DS (Ed). *Handbook of Health Behavior Research I: Personal and Social Determinants.* NY: Springer New York; 1997:3-4.
4. Blaxter M. *Health and Lifestyles.* London: Routledge; 1990.
5. Conner M, Norman P. Health behaviour. In: Johnston DW, , Johnston M, eds. *Health Psychology.* Vol 8: *Comprehensive Clinical Psychology.* Oxford: Elsevier; 1998:1-38.
6. Taiwo JO, Noah M. Pattern of dental clinic attendance of registered diabetic patients in Ibadan. *J Med Biomed Res.* 2006;5:36-43.
7. Health Education Authority. *The Scientific Basis of Dental Health Education, a Policy Document.* 3rd ed. London: Health Education Authority; 1989:13-4.
8. Olaleye AO. Study of dental treatment received by attenders in government general dental center hospital Dugbe, Ibadan, Nigeria: a 5-year longitudinal retrospective study. *World J Dent.* 2013;4:86-91.
9. Thomson WM, Williams SM, Broadbent JM, Poulton R, Locker D. Long-term dental visiting patterns and adult oral health. *J Dent Res.* 2010;89:307-11. doi:10.1177/0022034509356779.
10. Jamieson LM, Thomson WM. The dental neglect & dental indifference scales compared. *Community Dent Oral Epidemiol.* 2002;30:168-75.
11. Thomson WM, Locker D. Dental neglect & dental health among 26-year-olds in the dunedin multidisciplinary health & development study. *Community Dent Oral Epidemiol.* 2000;28:414-8.
12. McGrath C, Bedi R. Can dental attendance improve quality of life? *Br Dent J.* 2001;190:262-5.
13. Kassebaum NJ, Bernabe E, Dahiya M, Bhandari B, Murray CJ, Marcenes W. Global burden of severe tooth loss: a systematic review and meta-analysis. *J Dent Res.* 2014;93:20S-8S.
14. Alesia K, Khalil HS. Reasons for and patterns relating to the extraction of permanent teeth in a subset of the Saudi population. *Clin Cosmet Investig Dent.* 2013;5:51-6.
15. Bommireddy VS, Koka KM, Pachava S, Sanikommu S, Ravoori S, Chandu VC. Dental service utilization: patterns and barriers among rural elderly in Guntur district, Andhra Pradesh. *J Clin Diagn Res.* 2016;10:ZC43-7. doi:10.7860/JCDR/2016/17834.7456.
16. Gilbert GH, Stoller EP, Duncan RP, Earls JL, Campbell AM. Dental self-care among dentate adults: contrasting problem oriented dental attenders and regular dental attenders. *Spec Care Dentist.* 2000;20:155-63.
17. Åström AN, Ekback G, Ordell S, Nasir E. Long-term routine dental attendance: influence on tooth loss and oral health-

- related quality of life in Swedish older adults. *Community Dent Oral Epidemiol.* 2014;42:460-9.
18. Thomas S. Barriers to seeking dental care among elderly in a rural South Indian population. *J Indian Acad Geriatrics.* 2011; 7:60-5.
 19. Ahmed SM, Tomson G, Petzold M, Kabir ZN. Socioeconomic status overrides age and gender in determining health-seeking behaviour in rural Bangladesh. *Bull World Health Organ.* 2005;83:109-17.
 20. Santos-Eggimann B, Junod J, Cornaz S. Health services utilization in older Europeans. In: Boersch-Supan A, Brugiavini A, Juerges H, Mackenach J, Siegrist J, Weber G, eds. *Health, Aging and Retirement in Europe-First Result from the Survey of Health, Ageing and Retirement in EUROPE.* Mannheim: Mannheim Research Institute for the Economics of Aging; 2005:133-40.
 21. Sede PI, Ohemeng W. Socio-economic determinants of life expectancy in Nigeria (1980-2011). *Health Econ Rev.* 2015; 5:2. doi:10.1186/s13561-014-0037-z. Retrieved from: <https://link.springer.com/article/10.1186/s13561-014-0037-z>. Accessed May 06, 2017.
 22. Oginni FO. Tooth loss in a sub-urban Nigerian population: causes and pattern of mortality revisited. *Int Dent J.* 2005;55: 17-23.
 23. Upadhyaya CHM. The pattern of tooth loss due to dental caries and periodontal disease among patients attending dental department (OPD), Dhulikhel Hospital, Kathmandu University Teaching Hospital (KUTH). *Nepal Kathmandu Univ Med J.* 2009;7:59-62.
 24. Devaraj CG, Eswar P. Association between sociodemographic factors and dental service utilization among people visiting a dental college hospital in India: a descriptive cross-sectional study. *Indian J Stomatol.* 2011;2:212-5.
 25. Goel P, Singh K, Kaur A, Verma M. Oral healthcare for elderly: identifying the needs and feasible strategies for service provision. *Indian J Dent Res.* 2006;17:11-21.
 26. Deyo RA, Inui TS. Dropouts and broken appointments: a literature review and agenda for future research. *Medical Care.* 1980;18:1146-57.
 27. Johnson R, Horne B, Feltbower RG, Butler GE, Glaser AW. Hospital attendance patterns in long term survivors of cancer. *Arch Dis Child.* 2004;89:374-7.
 28. Britt E, Hudson SM, Blampied NM. Motivational interviewing in health settings: a review. *Patient Educ Couns.* 2004;53:147-55.
 29. 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 (Tehran).* 2011;8:81-9.
 30. Okeigbemen SA, Nnawuihe CU. Oral health trends and service utilization at a rural outreach dental clinic, Udo, Southern Nigeria. *J Int Soc Prev Community Dent.* 2015;5: S118-22.
 31. Agarwal AK, Sethi A, Sareen D, Dhingra S. Treatment delay in oral and oropharyngeal cancer in our population: role in socio-economic factors and health seeking behaviour. *Indian J Otolaryngol Head Neck Surg.* 2011;63:145-50. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3102173/>. Accessed May 06, 2017.
 32. Locker D, Maggiri J, Quinonez C. Income, dental insurance coverage and financial barriers to dental care among Canadian adults. *J Public Health Dent.* 2011;71:327-34.
 33. Helman CG. *Culture Health and Disease.* 5th ed. London: CRC Press; 2007:131.
 34. Nguyen L, Hakkinen U, Knuutila M, Jarvelin MR. Should we brush twice a day? Determinants of dental health among young adults in Finland. *Health Econ.* 2008;17:267-86.
 35. American Dental Association. *Toothbrushes.* 2012. Retrieved July 17, 2017, from: <http://www.ada.org/1321.aspx>.
 36. Damle SG, Patil A, Jain S, Damle D, Chopal N. Effectiveness of supervised toothbrushing and oral health education in improving oral hygiene status and practices of urban and rural school children: a comparative study. *J Int Soc Prev Community Dent.* 2014;4:175-81. doi:10.4103/2231-0762.142021.

Author Biographies

Olalere Omoyosola Gbolahan is a senior lecturer in the department of Oral and Maxillofacial Surgery, College of Medicine, University of Ibadan, Nigeria. His research interests are maxillofacial traumatology, dentoalveolar Surgery and TMJ diseases.

Abiodun Olubayo Fasola is a Professor of Oral and Maxillofacial surgery and Dean of the faculty of Dentistry, College of Medicine University of Ibadan, Nigeria. His research interests are maxillofacial traumatology, TMJ abnormalities and bioethics. He has numerous peer reviewed articles.

Timothy Olukunle Aladelusi is a Lecturer in the department of Oral and Maxillofacial Surgery, College of Medicine, University of Ibadan, Nigeria. His research interest is dentoalveolar surgery, maxillofacial oncology and reconstruction.