International Journal of Dentistry, Diabetes, Endocrinology and Oral Hygiene, 7(1) pp,1-13, 2026
Print ISSN: ISSN 2631-567X
Online ISSN: ISSN 2631-5688
Website: https://www.eajournals.org/
Publication of the European Centre for Research Training and Development-UK

Oral Hygiene Tool Use among Older Adults: Evidence from Peri-Urban Communities of Ogbomosho, Oyo State, Nigeria

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doi: https://doi.org/10.37745/ijddeoh.18/vol7n1113 Published May 10, 2026

Citation: Amusat A.M., Omirin T.I. and Binuomote O.K. (2026) Oral Hygiene Tool Use among Older Adults: Evidence from Peri-Urban Communities of Ogbomosho, Oyo State, Nigeria, *International Journal of Dentistry, Diabetes, Endocrinology and Oral Hygiene*, 7(1) pp,1-13

Abstract: *The practice of good oral hygiene using oral healthcare tools is necessary for healthy aging, yet the use of such tools by older adults in peri-urban locations remains unknown. This study investigated the use of oral hygiene tools among older adults in peri-urban communities of Ogbomosho, Oyo State, Nigeria.A cross-sectional survey was undertaken comprising 82 respondents aged 60 years and above residing in Oniyo and Tewure, peri urban communities of Ogbomosho with the use of a structured interview schedule. Data collected included questions on the sections: socio-demographic characteristics; awareness; information channels; use; practices; and challenges associated with the use of oral hygiene tools. Data were analysed using descriptive (percentages, mean scores, and standard deviations) and inferential (multiple linear regression) statistics.Awareness of basic oral hygiene tools (toothbrushes and chewing sticks) was high relative to awareness and use of modern oral hygiene tools (dental floss and mouthwash) which were low. Cleaning the teeth once daily, particularly in the morning hours, was a predominant practice among the respondents. Oral hygiene messages were primarily received through mass media (radio/television) and social sources, with very low limited dependence on dental professionals. Regression results revealed that information channels ($B=0.372$, $p< 0.05$) and perceived challenges ($B=0.104$, $p<0.05$) were significant predictors of oral hygiene tool use. Exposure to information channels and perceived challenges principally influenced older adults' oral hygiene tools rather than socio-demographic characteristics. It is imperative to harness mass media and community outreach to strengthen oral health education and improve oral practices while tackling key challenges.*

Keywords oral hygiene tools, older adults, oral health practices, information channels, oral health education

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INTRODUCTION

Oral health happens to be one of the most disregarded facets of public health, especially among older people, even though it constitutes an important part of the overall health and well-being of humans. Its preservation is as such a central necessity preserving health and wellbeing (Altas et al., 2025). Oral health does not just safeguard the condition of teeth and gums, but it has a direct effect on the overall health and quality of life of a person (Agnese et al., 2025). By definition, oral health is a condition that is devoid of chronic facial and mouth pains, infections of the mouth, sores, periodontal disease, decay of tooth, loss of tooth, as well as other disorders that reduce the biting, chewing, smiling, speaking, and maintenance of psychosocial well-being ability of a person (WHO, 2022). An estimated 3.5 billion individuals are affected by oral diseases globally, thereby placing such diseases among the most widespread non-communicable diseases (WHO, 2022). Prolonged exposure of older individuals to factors that induce risk, including inadequate oral hygiene, diets that are unhealthy, consumption of tobacco, and poor access to preventive healthcare make them vulnerable.

As individuals age, they undergo physiological and functional changes in their body that can make them vulnerable to problems relating to oral health. Such problems may include reduction in the flow of saliva, wearing of teeth, recession of gum, and more susceptible to dental caries and periodontal disease. For instance, reduction in the flow of flow of saliva (hyposalivation), connected to medication and systemic conditions, is common among older adults, making them more susceptible to dental caries and periodontal disease that can eventually predispose loss of teeth (Poudel et al., 2024). Likewise, failing physical ability, financial limitations, and poor access to healthcare services are barriers usually confronting older people that may affect their oral hygiene practices negatively. Poor oral health of elderly people can cause pain, loss of teeth, impairment with chewing, poor nutrition, and reduction in oral health–related quality of life (Lipsky et al., 2024; Chauhan et al., 2025).

The prevention of most oral diseases is dependent on the practice of good oral hygiene. Good oral hygiene entails making use of the right tools (e.g. toothbrushes, toothpaste, mouthwash, and dental floss. Out of these oral hygiene tools, brushing the teeth regularly with fluoride toothpaste from early life and across the course of life of an individual is basically recommended as the most effective preventive measure (American Dental Association, 2021; WHO, 2022). On the other hand, mouthwash and dental floss act as supplementary oral hygiene tools that enhance the removal of plaque most especially in parts of the mouth that are difficult or beyond the reach of toothbrush.

Regardless of these oral hygiene tools being available, along with their benefits, there is uneven awareness and use of such tools in certain locations, especially in low and middle-income nations across the globe. In several African contexts such as Nigeria, the use of traditional oral healthcare practices like chewing sticks/miswak and charcoal is still rife. Though such traditional oral

healthcare tools are culturally accepted and beneficial in certain ways, when used alone, they may not offer complete oral healthcare. As such, continuous dependence on traditional oral healthcare tools, coupled with low awareness and utilisation of modern tools, may predispose poor individual oral health outcomes.

Apart from the usually inadequate oral healthcare services in Nigeria, such services are mostly concentrated in urban centres, making rural and peri-urban areas to be underserved. With particular reference to low- and middle-income contexts, WHO (2022) pointed out that oral healthcare systems are mainly curative (treatment-oriented) rather than being preventive, with prevention, promotion of oral health, and education given inadequate emphasis. As such, the greater proportion of people in low- and middle-income settings, especially among older individuals, do not or have little contact with dental professionals, which significantly decreases any chance of them being exposed to oral hygiene information and ideal practices.

In such settings, factors such as low educational level, financial constraints, and limited access to dental professionals pose risks to older people. This is because such factors can determine the awareness and use of oral healthcare tools, resulting in inadequate oral hygiene practices thereby making them vulnerable to problems of oral health. Research has revealed that high health literacy level as well as dental care access are major predictors of oral hygiene behaviours, utilisation of services, and outcomes (Sistani et al., 2013; Batista et al., 2018).

The recognition of the significance of oral hygiene in fostering healthy ageing among older individuals notwithstanding, there is a dearth in empirical studies as regards the awareness and utilisation of oral hygiene tools among older individuals in the study area. An insight into the awareness level, utilisation patterns, along with other related issues is crucial to inform the design of interventions targeted toward enhancing oral healthcare outcomes. Consequently, this study was channeled to evaluate the use of oral hygiene tools among the older adults in peri-urban communities of Ogbomosho, Oyo State, Nigeria. It specifically sought to: assess the awareness, information channels, use, practices, and challenges associated with oral hygiene tools among older adults in the study area. A hypothesis was tested to determine the factors influencing the use of oral hygiene tools.

MATERIALS AND METHODS

Study design and location: A cross-sectional survey approach was employed in this study, and undertaken in Oniyo and Tewure, peri-urban communities of Ogbomosho, Oyo State, Southwestern Nigeria. The communities are rural with most of the inhabitants practicing farming, and having different healthcare services including oral healthcare. Within the sampled peri-urban community, older adults aged 60 years and above were the focus of the study.

Sample selection: Older adults aged 60 years and above constituted the population of the study. Owing to the nonavailability of a functional sampling frame in the study area for the population

of older adults, we adopted a household-based sampling method. This necessitated visiting household in the sampled communities and subsequent identification of households with older adults that were eligible. Eligible older adults were purposively sampled. In total, 82 older respondents who were available and willing participated in the study.

Data collection: A structured interview schedule was used to obtain primary data from the respondents. Given the respondents' age and level of literacy, the authors engaged and trained interviewers, who were familiar with the local settings of the study location, to administer the instrument. The training centred on the content of the instrument as well as its administration to engender uniformity in the collection of data and reduce variations in inter-interviewer. Face-to-face interviews were then carried out at the homes of the respondents', providing room for question clarifications where necessary and accurate responses.

Measurement of variables*:* A summary of how the variables in this study are operationalised is displayed in Table 1.

Table 1. Summary table of measurements of variables

Category of variable	Variable	Operationalisation	Scale and scoring
Socio-demographic characteristics	Sex, age, educational level, occupation, marital status, length of stay in community, contact with dental professionals	Self-reported by respondents	Nominal, ordinal, interval
Awareness of oral hygiene tools	Toothbrush and toothpaste, chewing stick/miswak, charcoal, toothpick, dental floss, mouthwash	Indicate if there is awareness or not	Aware = 1, Not aware = 0
Information channels	Family and friends, radio/television, community outreaches, internet, dental professionals	Frequency of receiving oral hygiene messages from each information channel	Not at all = 0 Occasional = 1 Always = 2 Cut-off mean: ≥ 1.00
Use of oral hygiene tools	Toothbrush and toothpaste, chewing stick/miswak, charcoal, toothpick, dental floss, mouthwash	Extent of use of each oral hygiene tool	Not at all = 0 Occasionally = 1 Always = 2 Cut-off mean: ≥ 1.00
Oral hygiene practices	Frequency of cleaning, timing, duration of use, perceived oral health, oral conditions	Self-reported practices and conditions	Categorical responses
Challenges to use of oral hygiene tools	Accessibility, affordability/cost, education, awareness, dental anxiety, availability of dental professionals	Degree of each challenge	Not a challenge = 0, Mild = 1, Serious = 2 Cut-off mean: ≥ 1.00

Data analysis: Analysis of data was achieved using version 21 of IBM SPSS software. Descriptive statistics were depicted as percentages (%), mean scores ($\bar{X}$) and standard deviations (SD), while

multiple linear regression was employed to test the hypothesis predicting the factors influencing the use of oral hygiene tools. The significance level was set at 5%.

RESULTS AND DISCUSSION

Socioeconomic characteristics of respondents

Table 2 presents the respondents' socioeconomic characteristics. A little more female (53.7%) than male (46.3%) were involved in the study, suggesting that women slightly dominate the population of older adults in the study location. The higher proportion of women compared to men among this set of older population may be connected to the fact that women live longer than men (OECD, 2023). Most of the study population fell within the youngest age category (60–64 years), while the mean age being 64.20±3.13 years. Age can determine a person's health behaviour. The World Health Organisation (2025) reckoned that both physical and mental capacity can gradually decline due to ageing, which can lead to changes in the priorities and health needs of people. In terms of education, slightly over half (51.2%) of them had no formal education, generally indicating a low educational attainment. Given that education influences oral health outcomes, with low levels of education connected to less favorable outcomes (Steinvik et al., 2025), older adult respondents with low educational profile are therefore likely to possess poor awareness and inappropriate use of contemporary oral hygiene tools.

Results on occupation revealed that the respondents were overwhelming farmers (87.8%), which typically reflects the agrarian characteristic of rural or per-urban communities in Nigeria. Maritally, while 53.7% of them were married, over one-third (36.6%) were widowed. Among older adults, this proportion of widows is justifiable, though it can have an effect on health practices. Length of time spent in communities showed 51.2% and 34.1% had lived in their communities for 21–30 years and 31–40 years, respectively, indicating lengthy residency periods. Their choice of oral hygiene tools can be shaped by the long residency, as they are likely to be attached to local customs and practices, especially continual use of traditional oral hygiene tools. Just 14.6% ever had contact with a dentist, reflecting limited accessibility and/or utilisation of oral healthcare-related services in the area of the study. This observation is in consonance with research that in several low- and middle-income nations, access to oral healthcare services is limited (WHO, 2022). Meanwhile, appropriate oral hygiene practices can be engendered through regular contact with dental professionals.

Table 2. Characteristics of the study samples

Variable	%	X̄
Sex		
Male	46.3	
Female	53.7	
Age		
60 – 64	63.4	64.20±3.13
65 – 69	29.3	
70 – 74	7.3	
75 – 79	0.0	
> 80	0.0	
Level of education		
No formal education	51.2	
Primary education	26.8	
Secondary education	17.1	
Tertiary	4.9	
Occupation		
Farming	87.8	
Artisan	7.3	
Civil Servants	4.9	
Others	0.0	
Marital Status		
Single	2.4	
Married	53.7	
Divorced	7.3	
Widowed	36.6	
Length of time spent community		
Since birth	2.4	
10 – 20 years	4.9	
21 – 30	51.2	
31 – 40	34.1	
Contact with dental professionals		
No	85.4	
Yes	14.6	

Source: Field survey, 2026.

Awareness of oral hygiene tools

Results on awareness of oral hygiene tools presented in Table 3 broadly show high awareness for traditionally common oral hygiene tools, but significantly low for modern or supplementary oral hygiene tools. For instance, all the respondents were aware of chewing sticks/miswak (100%), with also high awareness of toothbrush and toothpaste (95.1%) and charcoal (95.1%). Toothbrush

and toothpaste are conventional oral hygiene tools and they are widely used. The high awareness for chewing sticks and charcoal reflects the persistence of traditional oral hygiene practices owing to their inherent cultural origins. However, beyond these basic oral cleaning tools, there was significantly low awareness for modern tools among the respondents, in that just 14.6% and 9.8% were cognisant of mouthwash and dental floss, respectively. In particular, the respondents' low awareness of dental floss is striking, as it is an essential tool for proper care of teeth and gums, which the bristles of a toothbrush alone cannot effectively clean. As an interdental cleaning tool, dental floss helps to remove debris and interproximal dental plaque, thereby decreasing the chance of tooth decay and gum disease (American Dental Association. 2021). The gap in the respondents' awareness level of traditional and modern oral hygiene tools may be traced to the earlier observed low educational profile and limited contact with dental professionals. As such, it is safe to say that cultural practices as opposed to professional guidance practically influenced the awareness of the respondents, considering that the majority of them were never exposed to a dentist.

Table 3. Oral hygiene tool awareness according to study samples

Variable	Aware (%)
Toothbrush and toothpaste	95.1
Chewing stick/miswak	100.0
Charcoal	95.1
Toothpick	42.2
Dental floss	9.8
Mouthwash	14.6

Information channels on oral hygiene tools

Table 4 depicts that radio/television ($\bar{x}$ = 1.80±0.40) was the primal information channel through which the older adult population obtained messages regarding oral health. Radio and television are both mass media channels, suggesting that mass media perform significant roles in the dissemination of information about oral health in the study area. Given that radio and television are common and generally accessible, it is not unexpected they are important channels of health information. Radio in particular is recognised to be effective among rural populations usually characterised with low-literacy level (Sarrassat et al., 2015). Also constituting an important channel of information was family and friends ($\bar{x}$ = 1.46±0.74), suggesting that interpersonal means of communication shape oral health knowledge. Within social networks or circles in most traditional settings, information on existing health-related practices, whether appropriate or not, is often informally, especially through word of mouth and observation. Interestingly, the least utilised information channel was dental professionals ($\bar{x}$ = 0.05±0.22), echoing a previous finding on limited contact with dental healthcare services. Limited contact with dental professionals can create an information/knowledge gap about optimal oral hygiene practices. This is because it has been substantiated that providers of healthcare services are crucial in the delivery of reliable health-related information that encourage positive health behaviour (WHO, 2022). These findings

generally reflect the dominance of mass media and informal communication as channels of oral health messages among older adults, as opposed to underutilisation of digital and dental professional channels.

Table 4. Oral hygiene information channels according to study samples

Information channels	$\bar{X}$	SD
Family and friends	1.46	0.74
Radio/television	1.80	0.40
Community outreaches	0.98	0.42
Internet	0.10	0.30
Dental professionals	0.05	0.22

Use oral hygiene tools

With respect to use of oral hygiene tools, different extent of use was observed across the tools, a bit similar to the respondents' awareness of the tools (Table 5). Toothbrush and toothpaste ($\bar{X}$ = 1.37±0.83) and chewing stick/miswak ($\bar{X}$ = 1.27±0.74) were ranked first and second in terms of use. As conventional oral hygiene tools, toothbrush and toothpaste are popular among older adults in the study area. Brushing the teeth regularly with fluoride toothpaste from early life and across the course of life of an individual is recommended to prevent dental diseases (WHO, 2022). As earlier observed in this study, the finding on the use of chewing stick/miswak highlights the persistence of traditional oral hygiene practices owing to their inherent cultural origins.

In spite of earlier findings of high familiarity among the respondents, there was limited use of charcoal ($\bar{X}$ = 0.61±0.77) as an oral hygiene tool. This may be as result of a change in perceived inclination or it has been considered to have limited advantages relative to other oral hygiene tools. Additionally, there was a very low use of mouthwash ($\bar{X}$ = 0.07±0.34), which is a supplementary oral hygiene tool. Limited awareness, low educational profile and limited contact with dental professionals earlier observed may be adduced as reasons for the low use of supplementary oral hygiene tools.

Table 5. Oral hygiene tool use according to study samples

Variable	$\bar{X}$	SD
Toothbrush and tooth paste	1.37	0.83
Chewing stick /Miswak	1.27	0.74
Charcoal	0.61	0.77
Toothpick	0.00	0.00
Dental floss	0.00	0.00
Mouthwash	0.07	0.34

Oral hygiene practices

Table 6 shows the oral hygiene practices of the respondents. Findings revealed that three-quarter (75.6%) of the older adult population cleaned their mouth once daily, while around one-quarter (24.4%) did so twice daily. This frequency of oral hygiene is sub-optimal. With respect to the timing of cleaning the mouth, most (80.5%) of them did so in the morning, 14.6% during the night time, while 4.9% cleaned their mouth anytime of the day they chose. These practices still are not in line with standard recommendations, particularly cleaning the mouth at night is important for preventing the activities of bacteria which occur overnight. Recommended optimal practice is to clean or brush the mouth twice a day (American Dental Association, n.d.).

These oral hygiene routines happened to be established habits or behavioural patterns among the respondents, in that 82.9% of them had been making use of their present method of cleaning their mouth for more than five years. Habits are formed through repetition of behaviour in a regular situation, and strong habits or behavior (which have been established for long) are resistant to conscious attempts to change them (Lally and Gardner, 2013), especially among older individuals. As for the oral health status of their teeth, 56.1%, 34.1% and 9.8% described it as fair, good and poor, respectively. Tooth pain (31.7%) was the major oral health defect experienced by the respondents. Tooth pain may not be alien to older adults. Yet, WHO (2022) noted that untreated dental caries or advanced periodontal disease may predispose tooth pain, and it is more common in contexts where access to dental care is limited. Limited exposure to dental professionals was earlier observed in this study.

Table 6. Oral hygiene practices according to study samples

Statement	**%**
How many times do you clean your teeth/mouth in a day?	
Once	75.6
Twice	24.4
At what period of the day do you clean your mouth?	
Morning alone	80.5
Night alone	14.6
Morning and Night	0.0
Anytime	4.9
How long have you been using your current cleaning method?	
Less than 1 year	9.8
1 – 5 years	7.3
More than 5 years	82.9
How would you describe the state of your teeth?	
Good	34.1
Fair	56.1
Poor	9.8
Which of these do you experience?	

Tooth-pain	31.7
Bleeding gums	4.9
Difficult chewing	4.9
Loose teeth	4.9
None	53.7
How many times in a day should the teeth/mouth be cleaned to remain healthy?	
Once daily	29.3
Twice daily	46.3
Occasionally	4.9
Don't know	19.5

Challenges in sourcing tools for oral hygiene

The perceived challenges respondents encounter in their attempt to source oral hygiene tools are displayed in Table 7. All the weighted means scores of the listed challenges are less than 1, suggesting they do not pose any significant hindrance to sourcing of oral hygiene tools. Notwithstanding, poor enlightenment of the available types of oral hygiene tools ($\bar{X} = 0.95 \pm 0.77$), low education level on oral hygiene practices ($\bar{X} = 0.83 \pm 0.80$), and inadequate access to dentists or oral hygiene experts ($\bar{X} = 0.59 \pm 0.77$) were foremost among the perceived challenges. The first two challenges point to the fact that knowledge-related issues (i.e. awareness and education) are important in shaping oral hygiene practices or behaviour in the study area. Akinboboye et al. (2025) in a related study in Nigeria similarly observed inadequate oral health literacy among older adults residing in local communities. Also, the three top challenges further give credence to the finding that limited awareness, low educational profile and limited contact with dental professionals affect the use of oral hygiene tools. Overall, high health literacy level has been found to be connected to better communication between patients and dentists, which is in turn consistent with regular dental care patterns (Guo et al., 2014).

Table 7. Challenges associated with use of oral hygiene tools according to study samples

Variable	$\bar{X}$	**SD**
Poor accessibility of oral hygiene tools	0.37	0.76
Low education level on oral hygiene practices	0.83	0.80
High cost of oral hygiene tools	0.19	0.51
Dental anxiety or discomfort	0.39	0.54
Poor enlightenment of the available types of oral hygiene tools	0.95	0.77
Inadequate access to dental professionals	0.59	0.77
Scarcity/unavailability of oral hygiene materials	0.29	0.67

Factors influencing use of oral hygiene tools

Results from a multiple linear regression analysis in Table 8 highlights the predictors of the use of oral hygiene tools among the respondents. With a coefficient of determination (R^2) of 0.373, it infers that 37.3% of the variation in the dependent variable (use of oral hygiene tools) is explained by the independent variables. This observation suggests that there is a moderate association between predictors and use of oral hygiene tools. Additionally, the model was significant (F=2.379, p=0.039). Analysis further revealed information channels (B=0.372, p=0.036) along with perceived challenges (B=0.104, p = 0.048) were the significant predictors of oral hygiene tool use. The positive influence of information channels on oral hygiene tool use reinforces previous research that health information access and enhanced health literacy engender preventive health behaviors (WHO, 2022; Sistani et al., 2013; Batista et al., 2018). The significantly positive association equally observed between perceived challenges and use of oral hygiene tools is interesting. This paints a behavioural response scenario in which individuals become prompted to get themselves involved in hygiene practices when they experience oral health challenges. This is coherent with the Health Belief Model, which states that perceived need and perceived severity can encourage health-related action (Rosenstock, 1974).

Table 8. Multiple linear regression analysis showing determining the use of oral hygiene tools

Variable	B	Std. Error	Beta	t	Sig.
Constant	1.715	3.499	—	0.490	0.627
Sex	-0.410	0.291	-0.210	-1.408	0.169
Age	0.005	0.055	0.016	0.095	0.925
Education	0.076	0.310	0.039	0.245	0.808
Occupation	-0.503	0.608	-0.169	-0.826	0.415
Contact with dentist	0.422	0.534	0.153	0.791	0.434
Awareness score	-0.064	0.256	-0.054	-0.249	0.805
Information	0.372	0.169	0.366	2.195	0.036*
Challenges	0.104	0.051	0.379	2.055	0.048*

$R = 0.611$, $R^2 = 0.373$, Adjusted $R^2 = 0.216$, $F = 2.379$, $p = 0.039$ Significant at $p < 0.05$

CONCLUSION AND RECOMMENDATION

Study findings revealed high awareness of basic oral hygiene tools (i.e. toothbrushes and toothpaste, chewing sticks/miswak), but very low use of important modern hygiene tools (i.e. dental floss and mouthwash). Oral hygiene practices of the respondents were largely inadequate, as it was usual for the majority of them to clean their teeth once in a day and particularly during morning hours. Informational and behavioural factors were more crucial in determining oral hygiene practices relative to individual characteristics, given that information channels and perceived challenges significantly predicted the use of oral hygiene tools. It behooves concerned government health agencies, in conjunction with community health workers, to harness mass media (i.e. radio, television) and community outreach to strengthen oral health education, while at the same time address major challenges to enhance access to and use of oral healthcare services.

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