Predisposing, enabling and need factors influencing dental service utilization among a sample of adult Nigerians

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ABSTRACT

INTRODUCTION Utilization of dental services is recognized as important for the prevention and management of dental diseases. Community-based studies on dental service utilization patterns are sparse in African countries like Nigeria. This study describes factors influencing dental service utilization patterns among adult residents in Lagos, Nigeria.
METHODS Based on a cross-sectional design and utilizing a multi-stage sampling approach, 400 rural and urban participants participated in this study. Data collection was via interviewer administered questionnaires. Factors assessed included predisposing, enabling and need factors. Data management and analysis were carried out using SPSS version 23. The outcome of interest was dental service utilization. Pearson's chi-squared and logistic regression analyses ascertained associations.
RESULTS The mean (±SD) age of the participants was 35.51 (±11.16) years. We observed that 60.8% (95% CI: 55.8–65.6%) of the respondents had never utilized dental health services, 28.5% (95% CI: 24.1–33.2%) had their last dental visit >12 months preceding the study, while 10.8% (95% CI: 7.9–14.2) had a last dental visit ≤12 months preceding the study. Respondents aged ≥56 years and clerical workers/ skilled artisans as well as unskilled artisans/manual laborer's had lower odds of utilization. For enabling factors, urban dwelling was associated with significantly lower odds of non-utilization of dental services (OR=0.06; 95% CI: 0.04–0.10); while for need factors, having had an extraction done (OR=1.48; 95% CI: 1.23–2.07) and having a dental complaint in the previous year (OR=16.56; 95% CI: 10.03–27.34) were significantly associated with higher odds of non-utilization.
CONCLUSIONS Our study highlights the disparities in oral health access for the aged, rural residents, the financially deprived, unskilled workers, with a low education level, and those that had oral health complaints. Institution of policies should focus on increasing access to preventive oral health care in rural areas, increasing public oral health funding, and the inclusion of primary oral health components in the existing primary healthcare system.

INTRODUCTION

Oral health was recently defined as 'being multifaceted and including the ability to speak, smile, smell, taste, touch, chew, swallow, and convey a range of emotions through facial expressions with confidence and without pain, discomfort, and disease of the craniofacial complex'[1]. Achieving good oral health is considered a fundamental component of good overall health and wellbeing. Although most oral diseases are not life-threatening, they can have significant consequences, with the potential to impact food choices, nutritional status, self-confidence, growth, and sleep[2].

Access to oral healthcare, especially preventive services, is therefore considered important; it has been recognized as a critical tool for improving oral health[3] because it promotes early diagnosis and prompt treatment of diseases and facilitates maintenance of good oral health[4]. A population-based study that controlled for need and the direction of causality reported that regular dental visits were associated with early oral disease detection and prompt treatment[5]. Conversely, avoiding the dental clinic was associated with delayed diagnosis, untreated oral diseases and conditions, compromised health status and even death[6].

Dental service utilization often used as a proxy for access to care, is assessed by the number of visits to dental care facilities per year, or the number of people who have at least one dental visit in the previous year[7]. Studies from developed countries assessing the level and the pattern of utilization of dental health services have shown fair to good utilization patterns[8-11]. Nonetheless, financial barriers to obtaining needed care were comparatively higher for dental care relative to other healthcare services[12]. Unfortunately, in many Sub-Saharan African countries, there is little research in this area. The few existing reports show that utilization of dental care services is very low and visits to dental facilities are mostly undertaken for symptomatic reasons[13-18]. In Nigeria specifically, information on dental service utilization patterns among adult Nigerians is sparse, especially community-based studies. To date only one household-based survey has been conducted on oral healthcare utilization in Nigeria[15].

Dental service utilization is driven by a complex interaction of individual, social and contextual factors which influence access to dental care. In many African countries, the availability and accessibility of oral health services is seriously constrained and the provision of essential oral care is limited[13]. Access is also limited due to financial constraints and high levels of poverty since oral healthcare services are mainly financed by out-of-pocket payments[15,18]. There are suggestions that irregular dental attendance is largely due to low oral health awareness. However, there is no empirical evidence to confirm this, as there is a myriad of factors that could act as barriers to accessing oral healthcare services in developing countries[18-21]. To develop strategies for promoting access to oral healthcare there is a need to accurately identify the barriers particularly from the perspective of the end-users. Such information would provide evidence for policy direction and strategies for increasing access to oral healthcare. Thus, this research was designed to determine the patterns of dental service utilization and identify the self-reported perceived barriers to dental service utilization among a sample of adult Nigerians. We also sought to determine the associated predisposing (age, gender), enabling (education, occupation, income, location: rural/urban) and need factors (dental complaint in the last year) influencing dental service utilization.

METHODS
Study design and setting
A descriptive, cross-sectional, household survey was conducted among adult residents of one rural and one urban location in Lagos State, which is located in southwestern Nigeria and is the economic nerve-center of the country. It comprises 20 Local Government Areas (LGAs), which are the smallest units of administration in the country. This study was conducted in two LGAs; Ikeja LGA representing an urban cosmopolitan area, and Epe LGA representing a rural area.

Study location
Epe local government area has a total population of 323634 people of which 153360 are males[22]. Most of the inhabitants of the LGA engage in fishing and farming activities for their livelihood, though fishing is seasonal and synchronized to the fish life cycle. There is a secondary healthcare facility which houses a dental clinic staffed by two dentists and two dental nurses and only one private dental clinic staffed by one dentist and one dental auxiliary. Ikeja LGA, which is the capital of Lagos State, is a cosmopolitan area that is mostly well planned with commercial and residential areas and has a population of 648720 people. It houses a local and an international airport, the State government secretariat, and it is populated by urbane/upwardly mobile citizens, business people, as well as artisans. It has a tertiary dental facility, two military dental clinics as well as over 30 well-equipped private dental clinics with adequate number of personnel.

Theoretical framework for research
This research was based on the model proposed by Anderson and Newman[23] which classified the factors that influence health service utilization as predisposing factors, enabling factors and need factors. Predisposing factors influence the individual's tendency to use health services before the need arises, such as demographic characteristics (age, sex, and marital status), social structure (education, race, occupation, and ethnicity) and health beliefs (attitudes towards health services). Enabling factors denote attributes specific to the individual or community and are categorized into family-related variables (income, health insurance) and community-related variables (number of health facilities and health personnel in a community). Need factors however comprise perceived need (disability, symptoms and diagnosis) and professionally evaluated need (symptoms and diagnosis).

Sample selection
Using a sample size formula for descriptive studies (Z^2pq/e^2), a minimum sample size[24] of 195 was calculated for each study location using a prevalence utilization of dental services of 14% from a similar Nigerian study, thus making the total minimum sample size 390. A multi-stage sampling method was utilized with Epe being selected as the rural region and Ikeja as the urban region at the first stage using a replacement balloting technique. The second stage involved the identification of the principal study areas in each of the selected LGAs. One central and one peripheral geographical location was selected in each by the LGA officials based on a convenience sampling method. At the third level of sampling, the cluster sampling technique was utilized. Two clusters per selected location making a total of eight clusters was selected by simple random technique. Interviewers were assigned to visit the selected clusters and every household in the cluster was visited. The interviews were conducted from house-to-house and only one adult per household was interviewed. The process continued until the required number of participants was obtained.

Eligibility criteria
Participants included in the study were persons, aged ≥18 years, who permanently resided in the study locations. Temporary residents and those that refused to give informed consent were excluded from the study. Households that had no residents at the time of data collection were also excluded.

Data collection
Data were collected using interviewer administered structured questionnaires. The interviewers were fluent in the local languages of the communities visited and were given an intensive two-day training prior to the commencement of the data collection. They were trained on the data collection procedure and details of the study collection tool. The protocol for the study was submitted to the Health Research and Ethics Committee of the Lagos State University Teaching Hospital and written approval was obtained. In addition, permission to conduct the study was also obtained from the LGA authorities and local community leaders. Written informed consent was also obtained from all participants.

Study instrument
The survey instrument, which was evaluated for face and content validity, was pilot tested before use. Discussions and clarifications were made about the content of the questionnaire during training and pilot test. Based on the findings of the pilot test, the survey instrument was modified before final data collection. Data from the pilot test were not included in the final data analysis. The questionnaire included both closed-ended and open-ended questions and comprised three sections. The first section explored the sociodemographic characteristics of the participants including gender, age, level of education, occupation, and household size. The second section assessed the participants' dental utilization patterns including the type of dental facility attended, most recent dental complaint and the types of treatment received. The third section obtained information on the participants' perceived barriers to accessing regular dental care services including the cost of services, access to health insurance, transportation constraints, dental fear and apprehension, waiting period, and perceptions about the need for dental treatment.

Statistical analysis
Data management and analysis were carried out, using the Statistical Package of Social Science version 23.0 (IBM, Armonk, New York, USA). Descriptive statistics were presented as frequency, percentages, means and standard deviations. Age, gender and occupation were categorized as predisposing factors; income and location of residence as enabling factors; Self-rated oral health; and dental complaints in the past year and dental treatment received were grouped as need factors. Stratified analyses were conducted for the independent variables to determine the association between predisposing, enabling and need factors with health services utilization that differed across strata. The open-ended questions that assessed the perceived dental needs in the community were also grouped into categories and similarly analyzed. To determine whether the outcome variable was associated with the independent variables (predisposing, enabling, and need), Pearson's χ^2 and multiple logistic regression analyses were used. Statistical significance was set at p<0.05.

RESULTS
Table 1 presents the individual characteristics according to dental services utilization outcomes. A total of 400 participants were surveyed. The mean age of the participants was 35.51±11.16 years (range 18–80 years). Most participants were aged 26–35 years [136 (34.0%)], were females [232 (58.0%)], mainly of technical/semi-professional or clerical/skilled artisan occupations [143 (35.8%) each] but were equally distributed in the rural and urban regions [200 (50.0%) each]. We observed that 60.8% (95% CI: 55.8–65.6) of the respondents had never utilized dental health services; 28.5% (95% CI: 24.1–33.2) had their last dental visit >12 months preceding the study while 10.8% (95% CI: 7.9–14.2) had a last dental visit ≤12 months preceding the study. All individual predisposing factors (except gender) and all individual enabling factors (except income) and only evaluated need were significantly associated with all utilization outcomes. On perceived need, even though 79.8% of the respondents rated their oral health as very good, only 10.8% visited the dentist in the preceding year, even though 72.8% had a dental complaint in the preceding year.

Table 2 presents the odds ratios and confidence intervals from the bivariate analysis from predictor predisposing, enabling and need variables and utilization outcomes. Odds of non-utilization of dental services were significantly lower among respondents aged 26–35 years, 36–45 years and 46–55 years, those earning between 100000–199999 NGN monthly (157 Nigerian Naira about 1 US$ when the study was conducted) (OR=0.10; 95% CI: 0.00–0.12) and urban residents (OR=0.06; 95% CI: 0.04–0.10) but significantly higher among unskilled and manual laborers (OR=4.63; CI: 1.44–14.93) and those that did not need dental treatment (OR=13.52; 95% CI: 6.03–30.34). Odds of a recent dental visit ≤12 months preceding the study were however significantly higher among urban residents (OR=11.87; 95% CI: 4.15–33.92) and those that rated their oral health as poor or very poor (OR=3.45; 95% CI: 1.04–11.45).

In the multivariable regression analysis of significant predictors in the bivariate model (Table 3) for non-utilization of dental services, for predisposing factors, respondents aged 26–35 years (OR=0.26; 95% CI: 0.13–0.53) and those aged 36–45 years (OR:=0.19; 95% CI: 0.09–0.40) had significantly lower odds of non-utilization of dental services while clerical workers/skilled artisans (OR=3.66; 95% CI: 1.65–8.10) as well as unskilled artisans/manual laborers (OR=8.98;

Table 1. Individual predisposing, enabling and need characteristics according to non-utilization of dental services and last dental visit (N=400)

Characteristics	Total	Never used dental services		Last dental visit >12 months ago		Last dental visit ≤12 months ago		χ^2 and p
	n (%)	%	95% CI	%	95% CI	%	95% CI	
Predisposing: demographic								
Total	400 (100)	60.8	55.8–65.6	28.5	24.1–33.2	10.8	7.9–14.2	
Age (years)								
18–25	77 (19.3)	81.7	77.3–86.1	5.6	3.0–8.2	12.7	8.9–16.5	31.12 **<0.001***
26–35	136 (34.0)	55.9	51.6–60.2	14.0	11.0–17.0	30.1	26.2–34.0	
36–45	118 (26.5)	48.3	43.7–52.9	9.3	6.6–12.0	43.4	38.8–48.0	
46–55	49 (11.7)	67.3	60.6–74.0	12.2	7.5–16.9	20.4	14.6–26.2	
≥56	19 (4.5)	78.9	69.5–88.3	10.5	3.5–17.5	10.5	3.5–17.5	
Sex								
Male	168 (42.0)	57.1	53.3–60.9	13.1	10.5–15.7	29.9	26.4–33.4	2.26 0.322
Female	232 (58.0)	63.4	60.2–66.6	9.1	7.2–11.0	27.6	24.7–30.5	
Predisposing: occupation								
Managerial/professional	34 (8.5)	32.4	24.4–40.4	22.3	15.2–29.4	44.1	35.6–52.6	98.98 **<0.001***
Technical/semi-professional	80 (20.0)	31.2	26.0–36.4	55.0	49.4–60.6	13.8	9.9–17.7	
Clerical/skilled artisan	143 (35.8)	63.6	59.6–67.6	26.6	22.9–30.3	9.8	7.3–12.3	
Unskilled/manual	143 (35.8)	81.8	78.6–85.0	16.8	13.7–19.9	2.1	0.9–3.3	
Enabling: income (NGN)[a]								
≤9999	24 (13.6)	87.5	80.7–94.3	12.5	5.7–19.3	0.0	0.0–0.0	9.53 0.300
10000–49999	121 (68.8)	75.2	71.3–79.1	13.2	10.1–16.3	11.6	8.7–14.5	
50000–99999	16 (9.1)	56.2	43.8–68.6	18.8	9.0–28.6	25.0	14.2–35.8	
100000–199999	9 (5.1)	88.9	78.4–99.4	11.1	6.0–21.6	0.0	0.0–0.0	
≥200000	6 (3.4)	83.3	68.1–98.5	16.7	1.5–31.9	0.0	0.0–0.0	
Enabling: location								
Urban	200 (50.0)	89.0	86.8–91.2	9.0	7.0–11.0	2.0	1.0–3.0	134.40 **<0.001***
Rural	200 (50.0)	32.5	29.2–35.8	48.0	44.5–51.5	19.5	16.7–22.3	
Perceived need: self-rated oral health								
Very good/good	319 (79.8)	63.0	60.3–65.7	28.2	25.7–30.7	8.8	7.2–10.4	7.83 0.098
Fair	52 (13.0)	50.0	43.1–56.9	32.7	26.2–39.2	17.3	12.1–22.5	
Poor/very poor	29 (7.3)	55.2	46.0–64.4	24.1	16.2–32.0	20.7	13.2–28.2	
Perceived need: dental complaints in the past year								
No	109 (27.3)	53.2	48.4–58.0	31.2	26.8–35.6	15.6	12.1–19.1	5.06 0.080
Yes	291 (72.8)	63.6	60.8–66.4	27.5	24.9–30.1	8.9	7.2–10.6	
Need evaluated: previous treatment received								
Extraction	49 (12.3)	0	0.0–0.0	79.6	75.8–93.4	20.4	14.6–26.2	119.86 **<0.001***
Preventive or restorative	85 (21.3)	0	0.0–0.0	55.3	49.9–60.7	44.7	35.7–53.7	
No dental treatment	266 (66.5)	79.3	76.8–81.8	16.5	14.2–18.8	10.8	8.9–12.7	

a NGN: 157 Nigerian Naira about 1 US$ when the study was conducted. *Significant.

Table 2. Bivariate analyses between independent variables and non-utilization of dental services and last dental visit (N=400)

Variable	Non-utilization			Last dental visit >12 months			Last dental visit ≤12 months		
	OR	95% CI	p	OR	95% CI	p	OR	95% CI	p
Age (years) (Ref. 18–25)									
26–35	0.22	0.09–0.54	**0.001***	2.26	1.03–6.39	**0.043***	2.56	0.72–9.11	0.148
36–45	0.15	0.060–0.38	**<0.001***	5.76	2.24–14.80	**<0.001**	1.35	0.35–5.31	0.665
46–55	0.21	0.07–0.66	**0.007***	2.87	0.89–9.29	0.078	2.86	0.59–13.79	0.192
≥56	0.90	0.16–4.97	0.905	1.06	0.17–6.58	0.952	1.28	0.15–10.93	0.822
Sex (Ref. Female)									
Male	0.50	0.23–1.07	0.073	2.24	1.05–4.75	0.037	1.08	0.41–2.87	0.882
Occupation (Ref. Professional/ managerial)									
Technical/ semi-professional	0.47	0.15–1.45	0.188	8.31	2.93–23.58	**<0.001***	0.21	0.08–0.59	0.594
Clerical/skilled artisan	1.03	0.33–3.18	0.958	3.85	1.30–11.41	**0.015***	0.27	0.09–0.80	0.800
Unskilled/manual	4.63	1.44–14.93	**0.010***	1.57	0.51–4.77	0.430	0.05	0.01–0.22	0.200
Enabling–Financing: Income (Ref. >200000 NGN)[a]									
≤9999	0.55	0.24–12.76	0.708	0.91	0.04–18.81	0.954	2.95	0.50–4.10	0.893
10000–49999	0.24	0.02–2.75	0.248	0.62	0.05–7.94	0.712	1.24	0.89–7.44	0.594
50000–99999	0.11	0.01–1.08	0.058	2.63	0.29–24.15	0.394	0.49	0.04–3.94	0.293
100000–199999	0.10	0.00–0.12	**<0.001***	21.50	2.11–219.36	**0.010***	0.32	0.22–3.02	0.834
Enabling–Location (Ref. Rural)									
Urban	0.06	0.04–0.10	**<0.001***	9.33	5.34–16.31	**<0.001***	11.87	4.15–33.92	**<0.001***
Perceived need: Self-rated oral health (Ref. Very good/ good)									
Fair	0.56	0.22–1.45	0.231	1.00	0.41–2.43	0.998	1.77	0.62–5.03	0.287
Poor/very poor	0.55	0.19–1.56	0.261	0.93	0.33–2.61	0.895	3.45	1.04–11.45	**0.043***
Perceived need: Dental complaints in the past year (Ref.: No)									
Yes	1.10	0.54–2.23	0.788	0.86	0.45–1.67	0.663	1.00	0.45–2.21	0.493
Need evaluated: Previous treatment received (Ref. Preventive/restorative)									
Extraction	1.70	0.62–4.66	**0.005***	1.02	0.43–2.46	0.958	0.64	0.23–1.79	0.394

a NGN: 157 Nigerian Naira about 1 US$ when the study was conducted.

95% CI: 3.91–20.64) had higher odds of non-utilization. For enabling factors, urban dwelling was associated with significantly lower odds of non-utilization of dental services (OR=0.06; 95% CI: 0.04–0.10); while for need factors, having had an extraction done (OR=1.48; 95% CI: 1.23–2.07) and having a dental complaint in the previous year (OR=16.56; 95% CI: 10.03–27.34) were significantly associated with higher odds of non-utilization.

Table 3. Multivariable logistic regression analysis of significant predictors in the bivariate model of non-utilization of dental services (N=400)

Variable	Final model		
	Odds ratio[a]	95% CI	p
Predisposing			
Age (years) (Ref. 18–25)			
26–35	0.26	0.13–0.53	**<0.001***
36–45	0.19	0.09–0.40	**<0.001***
46–55	0.43	0.18–1.01	0.053
≥56	0.78	0.22–2.75	0.694
Sex (Ref. Female)			
Male	0.77	0.51–1.16	0.209
Occupation (Ref. Professional/managerial)			
Technical/semi-professional	0.95	0.40–2.25	0.905
Clerical/skilled artisan	3.66	1.65–8.10	**0.001***
Unskilled/manual	8.98	3.91–20.64	**<0.001***
Enabling			
Income (Ref. >200000 NGN)b			
≤9999	0.43	0.12–0.56	0.041
10000–49999	0.18	0.04–0.88	0.033
50000–99999	1.14	0.10–12.66	0.913
100000–199999	0.71	0.06–8.40	0.789
Location (Ref. Rural)			
Rural (Ref.)			
Urban	0.06	0.040–0.10	**<0.001***
Need factors			
Perceived dental health (Ref. Very good/good)			
Fair	1.38	0.64–2.98	0.406
Poor/very poor	0.81	0.33–2.00	0.655
Dental complaints in the past year (Ref. No)			
Yes	16.56	10.03–27.34	**<0.001***
Need evaluated			
Previous treatment received (Ref. Preventive/restorative)			
Extraction	1.48	1.23–2.07	**0.003***

a Adjusted for age, sex, occupation and location. b NGN: 157 Nigerian Naira about 1 US$ when the study was conducted.

DISCUSSION

Dental service utilization possibly influences the prevalence of oral diseases and it is dependent on several factors that differ based on the healthcare system in each country[8]. The aim of our study was to examine the enabling and predisposing factors and need factors that influence the utilization of dental services in a rural and an urban region in Lagos, Nigeria. Comparatively little is known about oral health service utilization trends among populations of African countries due to paucity of research data. Our findings are, however, unique compared to previous research that have been conducted on the utilization of dental services in Nigeria since we utilized a community-based survey rather than relying on a hospital-based cohort. Only about 39.2% of our study population reported any prior dental visit while only 10% visited the dentist in the preceding year. The low utilization rates suggest that trends in dental services utilization have not improved in recent years, further justifying the need to examine the factors that determine utilization, which may help to design appropriate interventions to improve access to dental services.

Most participants were aged 26–35 years, which represents a very productive age group, and were female. Considering the fact that women are often the key decision makers regarding family oral healthcare and that maternal attitude to oral health has been reported to be a significant predictor of children's oral health in Nigeria[25], their views on barriers to oral health will likely be important for understanding dental utilization patterns. Our study participants had technical/semi-professional or clerical/skilled artisan occupation, but were equally distributed in the rural and urban regions. Our results show that all individual predisposing factors (except gender) and all individual enabling factors (except income) and only need were evaluated to be significantly associated with all utilization outcomes.

For predisposing factors, in both the bivariate and multivariable models, the odds of utilization of dental services were significantly higher among younger respondents, while the aged respondents had a lower likelihood of utilization of dental services. It has been shown that dental care utilization is low among older people, predominantly among the socioeconomically deprived due to major barriers. Dental care cost, shortage of professionals, and lack of awareness with regard to services provided and location of facilities have been important barriers to the utilization of dental services among older adults[26]. Ajayi and Arigbede[27] identified the cost of dental treatment as a major barrier to oral healthcare utilization but they observed a more significant association between access to care and the fear of dental injection and the feeling of insecurity from the dental operating environment. This indicates that dental anxiety may be a modifying factor to other predisposing factors.

For enabling factors, urban dwelling was associated with

significantly higher odds of utilization of dental services. A similar study on dental services utilization found that almost 10% of the rural community preferred to use the traditional healer compared to 5.6% individuals residing in the urban area. Studies from different regions have observed a difference between the utilization of oral healthcare in regard to residence, with rural residents making less use oral healthcare than their urban counterparts[28,29]. Epe LGA in our study had only one secondary healthcare facility, which houses a dental clinic staffed by two dentists and two dental nurses and only one private dental clinic staffed by one dentist and one dental auxiliary. Thus, service availability and accessibility are important factors in dental service utilization. People living in rural areas have been found to have more unmet dental needs and lower dental service utilization rates than those in urban sites[29]. In remote and rural areas, where distances to clinics are great, people are less likely to demand care, to have higher rates of dental caries, and permanent tooth loss than urban populations[30]. Majority of dental facilities are located in cities and towns because access to social amenities, such as electricity and potable water, is easier in urban areas. Only 20% of dentists in both the private and public sectors work in rural areas where more than half of the population resides[31], despite growth in the dental education sector and the advent of programs designed to promote dental practice in these areas.

Similarly, we observed that clerical workers/skilled artisans as well as unskilled artisans/manual laborers who were less educated and of a lower socioeconomic status (SES) had lower odds of utilization. This result confirms previous findings showing that socioeconomic conditions are very important predictors of dental services usage, while a higher SES has been found to increase the likelihood for preventive measures in general[32] and for utilizing dental prevention in particular[33]. The evidence shows, with a remarkable degree of consistency, that the deprived actually receive a less share of public health expenditure in developing countries than the rich[34]. Low household income and high cost of dental treatment have a negative impact on the utilization of oral healthcare and people with socioeconomic disparities are 7–9 times more likely to refrain from dental treatment and endure dental pain. Eliminating financial barriers to accessing healthcare amongst low socioeconomic and less educated groups may have a positive effect on oral healthcare utilization. Third party payment methods such as dental insurance, dental health-benefits and public dentalcare services subsidize dental expenditures and are believed to be an important factor in oral healthcare utilization, but these services are rarely available especially in rural areas of Nigeria. There have been repeated calls for a reduction in the reliance on out-of-pocket financing in developing countries.

On perceived need, even though 79.8% of the respondents rated their oral health as very good, and only 10.8% visited the dentist in the preceding year, about 72.8% had a dental complaint in the preceding year. This proportion was lower than the 14% reported by Fiske et al.[35] and the 28% of the population who had utilized services reported by Thomas[36]. For evaluated need, most of the participants in our study that utilized dental services within the preceding year had preventive or restorative treatment while those that had their last dental visit over 12 months had mainly dental extraction done. In related African studies, Varenne et al.[17] observed that even though a high proportion of their respondents (62%) reported pain or acute discomfort affecting daily life, only 28% used oral health facilities, 48% used self-medication and 24% sought no treatment at all. Westaway et al.[13] also reported that only 37% of their sample had consulted a dentist or medical practitioner for oral care and it was usually for extractions[13]. In another study, it was observed that the most common complaint causing the patient to seek dentalcare services was caries with pulpal involvement (52.4%), and 60% of all complaints were associated with pain[16]. Our results thus agree with others that reported that pain and discomfort were the main factors that determine dental services usage across different age groups[25,27].

In many societies across the world, people utilize oral health care only when they feel the need to. Severe toothache, loss of teeth and aesthetic concerns generally lead people to seek and utilize oral healthcare. Oral and dental health are usually given low priority and perceived as being of minor importance compared with general health; they self-manage the problem and dental visits are postponed until the symptoms have abated or until the pain becomes unbearable[25]. Diseases such as toothache often serve as prompts for seeking health services and patients are often unaware that severity of symptoms does not always correlate with the morbidity of the health condition. Oral cancer, however, which has a slow insidious onset may not be taken seriously until it is too late. Dental pain adversely affects the quality of life, normal functioning, and daily living of people, and most dental visits are aimed at immediate relief of pain. Patients often present themselves for dentalcare at the later stages of dental disease when overt symptoms such as pain and extreme discomfort appear, rather than earlier, i.e. a problem-oriented visit rather than a prevention-oriented one.

Our findings further validate the use of the Andersen and Newman[23] behavioral model for dental research applied to health services, as it highlighted the underlying factors associated with non-utilization of dental services. An ideal oral healthcare system should provide preventive, restorative and rehabilitative care. Thus, a refocusing of service provision towards preventive care, as suggested in the National oral health policy, is advocated. One method of achieving this involves using the existing primary healthcare system, which has been relatively successful in making healthcare facilities accessible to most Nigerians, as a platform from which to provide preventive oral

healthcare[37,38]. Watt[39] advocated for an 'upstream' approach to reducing oral health inequalities by moving from approaches that focus on treatment which do not address differences in access to healthy food, costs of toothbrushes, fluoridated toothpaste and preventive care. A common risk factor approach and the utilization of the Basic Package of Oral Care at the PHC level may lead to an improvement in oral health in rural regions of Nigeria.

Strengths and limitations
Data from this study must be interpreted with caution. Our study employed a descriptive design, and a self-reported survey which pre-empts inferences regarding causality and temporal relationships between variables, thus longitudinal studies should be conducted to further validate our findings. Our community-based data collection utilizing a proper sampling method however increases the generalizability of our findings to the Nigerian population.

CONCLUSIONS
Our study highlights the disparities in oral health access for the aged, rural residents, the financially deprived, unskilled workers and those that have a low education level, as well as those that had oral health complaints. Institution of policies to specific predisposing, enabling and need factors are advocated to improve utilization. Such policies should focus on increasing access to preventive oral healthcare in rural areas, increasing public oral health funding, and the inclusion of primary oral health components in the existing primary healthcare system.

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