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Cross-sectional study of Oral Health-related Quality of Life in Ile-Oluji, Ondo State, Nigeria: A Pilot Study

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ABSTRACT

Background and aim: This study presents an oral health survey in Ile-Oluji, Nigeria, following the establishment of a dental clinic at the local Primary Health Care Center. The objective was to establish baseline data for future interventions.

Material and methods: A cross-sectional study involving 400 participants was conducted using multi-stage sampling. Data were collected through questionnaires and oral examinations. Statistical analysis was performed using SPSS ($p < 0.05$).

Results: The study population was predominantly young, with a mean age of 29.4 ± 3.7 years, and 77% were aged 15–34. Only 13% had ever visited a dentist. Sub-optimal oral hygiene was common, as 20% had calculus deposits, and only 29.5% brushed their teeth twice daily. Despite 90.5% using a toothbrush and toothpaste daily, the caries prevalence was 21.5% (10% in males, 11.5% in females), with 63.5% consuming refined sugar at least once daily. Periodontal assessment showed that 5.5% had gingivitis and 10% had periodontitis. Although only 3% rated their oral health as poor, the overall quality of life score was low. The mean DMFT was 0.39 ± 0.03 , with decayed, missing, and filled teeth contributing 55.1%, 30.8%, and 14.1%, respectively.

Conclusions: This population, despite a high self-rated oral health status, experienced poor dental visits, suboptimal oral hygiene practices, and a low quality of life. Adjunct services, including auxiliary training and increased awareness campaigns, are recommended to promote early uptake of dental care.

1. Introduction

Oral health was integrated into Primary Health Care (PHC) over 40 years ago in recognition of its inextricable relationship with general health. Globally, this recognition has led to the full integration of oral health into general healthcare at the PHC level, ensuring the provision of essential oral health services.^[1] Despite the potential benefits of improved access to care and efficient resource utilization, full integration of oral health into Nigeria's PHC system has seen limited success.^[1, 2] Currently, Nigeria has 32,916 PHC facilities,^[1] yet less than 0.1% provide comprehensive oral health services, including a basic package of oral care. In most centers, the only available service is oral health education, often delivered on demand by inadequately trained health auxiliaries.^[1, 2] This gap in service delivery contributes to poor oral health behaviors due to misinformation or a lack of adequate information.

Additionally, oral diseases are prevalent and largely untreated in Nigeria, leading to pain, functional limitations, reduced productivity, and a diminished quality of life.^[1] Many Nigerian communities have little to no data on oral health.⁶ There is an urgent need for such data to support advocacy, planning, evaluation, and surveillance efforts to integrate oral health into PHC, especially in rural and suburban areas where access to dental care is severely limited.^[7] Ile-Oluji, a suburban community in Ondo State, southwestern Nigeria, recently benefited from establishing a dental clinic within its PHC through private and government efforts. This pilot survey was conducted to establish baseline oral health data in the community following the introduction of dental services at the PHC. The findings will help tailor oral health services and promotional efforts to meet community needs while providing evidence to support the full integration of oral health into PHC.

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2. Material and methods

Ile-Oluji is a suburban community in Ondo State, Nigeria, with an estimated population of approximately 264,000.^[8] It serves as the headquarters of the Ile-Oluji/Okeigbo Local Government Area and is predominantly inhabited by the Yoruba people. The town is primarily agrarian, with cocoa as its major cash crop, facilitating the establishment of the Premium Cocoa Products Ile-Oluji Limited, a cocoa processing company. Additionally, the community is home to the Federal Polytechnic, Ile-Oluji, and several public primary and secondary schools. This cross-sectional descriptive study was conducted over six months, from April to September 2024. Ethical approval was obtained from the Unimed Health Research Ethical Committee in Ondo (NHREC/TR/UNIMED-HREC-Ondo St/22/06/21). The sample size for the study was determined to be 400, using Yamane's sample size formula,^[9] where the population size was set at 264,000, and the allowable error level was 5%. Participants were selected through a multi-stage sampling technique. Initially, five residential areas were randomly chosen from the ten major residential areas in Ile-Oluji using the balloting method. Individuals from these selected areas who met the inclusion criteria were enrolled in the study. Eligible participants included individuals who provided informed consent, while those under 18 years required parental or guardian consent. Exclusion criteria included individuals with chronic medical conditions that negatively affected their quality of life and non-residents of Ile-Oluji. Data on sociodemographics, oral health behaviors, self-reported oral health status, and oral health-related quality of life were collected using an interviewer-administered questionnaire. The General Oral Health Assessment Index (GOHAI) was employed to assess oral health-related quality of life. Each of the 12 questions in the GOHAI questionnaire, except for questions 3, 5, and 7, was scored based on participant responses as follows: "never" scored 3 points, "sometimes" scored 2 points, and "always" scored 1 point. Questions 3, 5, and 7 were reverse-scored, as they were framed

in a positive context. The GOHAI scores were categorized into three levels: high (34 – 36), moderate (31 – 33), and low (≤ 30).^[10] The questionnaire was adapted for local use by translating it into Yoruba. A team of three bilingual experts translated the questionnaire from English to Yoruba, and another team of three independently back-translated it into English. The two English versions were compared, and any discrepancies were resolved before finalizing the Yoruba version. Oral examinations were conducted using a mouth mirror, explorer, and probe under natural light. Three trained and calibrated dentists performed the examinations, achieving an inter-examiner agreement of 94.9%. Diagnosis of dental caries and periodontal conditions was made following the World Health Organization (WHO) Survey criteria.^[11] To ensure the reliability of the questionnaire and data collection process, a pilot study involving 20 participants was conducted in a neighboring village. Feedback from the pilot study was used to refine the Yoruba version of the questionnaire before implementation in the main study.

Data analysis

Data was summarized using descriptive statistics of means, standard deviations (SD), and percentages. Data was analyzed using the Statistical Package for the Social Sciences (Version 25.0. Armonk, NY, USA: IBM Corp)^[12] with p set at < 0.05 .

3. Results

A total of 400 participants were included in the study. The mean age of the participants was 29.4 ± 3.7 years, with an age range of 15 to 95 years. The most common age group was 15–20 years. The male-to-female ratio was 1:1.2. Regarding occupation, 65.0% of the participants were students, while 12.0% were engaged in agro-business. 73.5% of the participants were single, 57.0% had completed secondary school education, whereas 28.0% had attained tertiary education. (Table 1).

Table 1. Socio-demographic characteristics.

Variable	Category	Frequency	Percentage
Age (in years)	15-20	230	57.5
	21-34	78	19.5
	35-50	44	11.0
	51-64	36	9.0
	65 and above	21	3.0
Sex	Male	182	45.5
	Female	218	54.5
Occupation	Healthcare worker	14	3.5
	Student	260	65.0
	Agrobusiness	48	12.0
	Civil servant	26	6.5
	Pensioner	18	4.5
	Clergy	2	0.5
	Artisan	2	0.5
	Others	30	7.5
Marital status	Single	294	73.5
	Married	102	25.5
	Widowed	4	1.0

Highest level of Education	Non-formal education	8	2.0
	Primary school	52	13.0
	Secondary school	228	57.0
	Tertiary	112	28.0

Dental history and oral health behavior

Only 13.0% of the study participants had ever visited a dentist; 53.8% reported that their visit was due to toothache with cavities. 29.5% of participants reported cleaning their teeth twice daily, while 90.5% used a

toothbrush and toothpaste for oral hygiene. Regarding dietary habits, 63.5% of the participants consumed refined sugar at least once daily. 13.5% of the participants reported daily tobacco and alcohol use. (Table 2).

Table 2. Dental history and Oral Health behaviour of participants.

Variable	Frequency	Percentage
Have you visited a dentist before?		
Yes	52	13.0
No	348	87.0
What was the main reason for the visit to the dentist?		
I had/have bleeding gums	14	26.9
I had toothache and cavities	28	53.8
I had/have loose teeth	2	3.8
I had/have a sensitive tooth	8	15.5
How often are you cleaning your teeth?		
Twice or more a day	118	29.5
Once a day	278	69.5
Not every day	4	1.0
What do you use to clean your teeth?		
Chewing stick	22	5.5
Toothbrush & toothpaste	362	90.5
Charcoal	14	3.5
Salt	2	0.5
How often do you eat refined, sugary foods or drinks on a typical day?		
Never	24	6.0
Less than once per day	122	30.5
Once per day	86	21.5
Twice per day	78	19.5
Three or more per day	90	22.5
Do you use tobacco and/or take alcohol daily presently?		
Yes	54	13.5
No	346	86.5

Self-rated oral health and GOHAI scores

In this study, 79.5% of participants rated their oral health as good, while only 3.0% rated it as poor. The General Oral Health Assessment Index

(GOHAI) scores ranged from 1.6 to 2.6 across different questions. The lowest scores were recorded in question 5 (1.6), which assessed discomfort while eating, and question 7 (2.1), which evaluated satisfaction with the appearance of teeth and gums. The overall GOHAI score was 28.7. (Table 3 and Fig. 1).

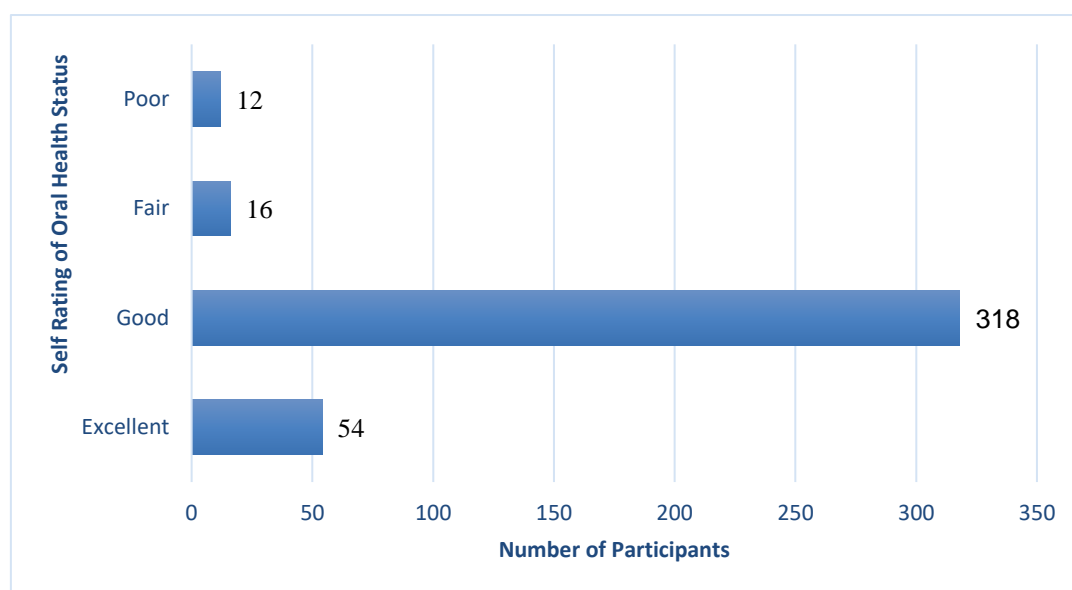


Fig. 1. Self-rating of Oral Health status by study participants.

Table 3. Study participant's responses to GOHAI questions and scores.

Questions	Never N (%)	Sometimes N (%)	Always N (%)	Average GOHAI Score
Q1: How often did you limit the kinds or amount of food you eat because of problems with your teeth or dentures?	256 (64.0)	102 (25.5)	42 (10.5)	2.5
Q2: How often did you have trouble biting or chewing food like firm meat or apples?	234 (58.5)	124 (31.0)	42 (10.5)	2.5
Q3: How often were you able to swallow comfortably?	116 (29.0)	54 (13.5)	230 (57.5)	2.3
Q4: How often have your teeth or dentures prevented you from speaking the way you wanted?	292 (73.0)	54 (13.5)	54 (13.5)	2.6
Q5: How often were you able to eat anything without feeling discomfort?	234 (58.5)	100 (25.0)	66 (16.5)	1.6
Q6: How often did you limit contact with people because of the condition of your teeth or dentures?	294 (73.5)	60 (15.0)	46 (11.5)	2.6
Q7: How often were you pleased with the looks of your teeth and gums or dentures?	124 (31.0)	106 (26.5)	170 (42.5)	2.1
Q8: How often did you use medication to relieve pain or discomfort from around your mouth?	254 (63.5)	80 (20.0)	66 (16.5)	2.5
Q9: How often were you worried or concerned about the problems with your teeth, gums, or dentures?	232 (58.0)	98 (24.5)	70 (17.5)	2.4
Q10: How often did you feel nervous or self-conscious because of problems with your teeth, gums, or dentures?	284 (71.0)	70 (17.5)	46 (11.5)	2.6
Q11: How often did you feel uncomfortable eating in front of people because of problems with your teeth or dentures?	302 (75.5)	52 (13.0)	46 (11.5)	2.6
Q12: How often were your teeth or gums sensitive to hot, cold, or sweets?	236 (59.0)	96 (24.0)	68 (17.0)	2.4

Normative assessment of oral health status

Regarding periodontal health, 20.0% of participants had calculus deposits, 5.5% had gingivitis, and 10.0% had periodontitis. The prevalence of dental caries was 21.5%, with a slightly higher prevalence in females (11.5%) than males (10.0%). The mean Decayed, Missing, and Filled Teeth (DMFT) score was 0.39 ± 0.03 , with mean scores of 0.4 ± 0.02 for males and 0.41 ± 0.05 for females. The components of the DMFT score were distributed as

follows: decayed teeth contributed 55.1%, missing teeth accounted for 30.8%, and filled teeth comprised 14.1%.

4. Discussion

This study assessed oral health practices, self-rating, quality of life, and normative oral health status among residents of Ile-Oluji, an agrarian suburban community in Ondo State, Nigeria. The majority of participants

were adolescents and young adults with education beyond the primary school level. Unsurprisingly, most of the study population were students and unmarried, likely due to the presence of a tertiary educational institution in Ile-Oluji. The second-largest occupational group comprised individuals engaged in agriculture, particularly crop farming, underscoring the prominence of agribusiness especially cocoa farming in the community. In this study, slightly above one-tenth of the study participants had visited a dentist before. Although this finding is higher than a prior study in a Nigerian rural community, which reported 6.7%,^[12, 13] indicates a relatively low level of engagement with dental care services. Toothache, cavities, and bleeding gums are the major reasons precipitating dental visits in the population. This finding is in agreement with reports from previous studies by Jeboda et al., 2008; Orenuga and Sofola, 2005.^[14, 15] Cultural beliefs may contribute to this trend, as some Nigerians perceive dental visits as necessary only for sick individuals or associate dental treatment with tooth loss. Consequently, many seek care reactively, only when faced with unbearable orofacial pain.^[6] However, this study did not explore the reasons for low dental care utilization. Daily oral hygiene practices among participants were suboptimal, with only 29.5% brushing their teeth twice daily. Nevertheless, nearly all participants used toothbrushes and toothpaste for oral hygiene, while a small proportion employed traditional methods such as charcoal and chewing sticks. When used correctly, these traditional methods can be as effective as modern toothbrushes in plaque removal.^[16] However, care should be exercised when using these traditional mouth cleaning methods as they are prone to some risks, such as an abscess in the gingiva due to splinters from chewing sticks or extrinsic stains with charcoal.^[17] A significant proportion (63.5%) of participants consumed refined sugar at least once daily, while approximately 13.5% reported daily use of tobacco and alcohol. Evidence suggests that these habits increase the risk of various oral and systemic diseases,^[18] highlighting the need for targeted interventions to curb their consumption. In self-reported oral health ratings, most participants assessed their oral health as good or excellent, consistent with previous studies.^[6, 19] However, the overall oral health-related quality of life, as measured by the General Oral Health Assessment Index (GOHAI), was low (average score ≤ 30). The primary contributors to this low score were discomfort while eating and dissatisfaction with dental aesthetics. These findings may be attributed to the predominantly youthful study population, who emphasize aesthetics more. Additionally, the culture of late dental presentation likely explains the high levels of eating discomfort. Promoting early dental visits and addressing aesthetic concerns could enhance oral health outcomes in this community. The prevalence of periodontal disease among participants was relatively low. Although gingivitis and periodontitis rates were lower than those reported in previous studies (ranging from 62.2% to 86.8%),^[17, 20] about one-fifth of the population had poor oral hygiene. Oral health promotion programs emphasizing proper oral hygiene and increased brushing frequency should be prioritized. The deployment of plaque-disclosing agents in community education efforts could further reinforce oral hygiene practices. This study's prevalence of dental caries aligns with previous Nigerian studies,^[13] while the mean Decayed, Missing, and Filled Teeth (DMFT) score remains low. Interestingly, despite limited dental visits, the substantial contributions of missing and filled teeth to the DMFT score suggest a high caries burden among those who sought treatment. This underscores the importance of encouraging timely dental visits, particularly at the onset of symptoms, to prevent disease progression and improve oral health outcomes.

5. Conclusion

This study revealed poor dental visit rates, suboptimal oral hygiene practices, and low oral health-related quality of life among residents of Ile-Oluji despite high self-rated oral health status. Adjunct services should be incorporated alongside dental care, including training auxiliaries for oral health education and promoting the role of preventive practices in maintaining healthy oral tissues and aesthetics to improve oral health outcomes. Additionally, increasing awareness about the benefits of early dental visits is crucial. The findings provide valuable baseline data on oral health in Ile-Oluji, offering insights into the community's oral health status and its impact on quality of life. This information will facilitate the development of tailored interventions to improve oral health awareness, promote early care-seeking behaviors, and refine dental services and public health initiatives to address local challenges effectively. Furthermore, the study lays the groundwork for assessing the impact of dental services in the community.

Conflict of Interest

The authors declared that there is no conflict of interest.

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