

Dental pain care-seeking, management and self-reported outcomes among older adults attending primary healthcare centres in Ado-Ekiti, Nigeria: a descriptive cross-sectional study

Falowo Segun Emmanuel^{1*} and Ajetunmobi Adeshola Adelekan²

¹ Department of Dentistry and Oral Health, Faculty of Medicine and Health Sciences, Frontier University, Garowe, Somalia. Email: faloseg@yahoo.com

² Department of Dentistry, Ekiti State University Teaching Hospital, Ado-Ekiti, Ekiti State, Nigeria. Email: adesholaajetunmobi@gmail.com

*Correspondence: Falowo Segun Emmanuel, faloseg@yahoo.com

Abstract

Background: Dental pain can impair eating, sleep, oral function and quality of life in older adults. In settings with limited dental personnel and equipment, care may be restricted to temporary symptom control and referral. This study assessed dental pain care-seeking, reported treatment and self-reported outcomes among older adults attending selected primary healthcare centres in Ado-Ekiti, Nigeria.

Methods: A descriptive cross-sectional study was conducted from April to September 2025 in five purposively selected primary healthcare centres. Adults aged 60 years or older who reported dental pain during the preceding 12 months completed an interviewer-administered questionnaire. The minimum sample size calculated with Cochran's formula was 196. A total of 187 complete questionnaires were analysed. Categorical variables were summarised using frequencies and percentages.

Results: Among 187 participants, 100 (53.5%) were male and 63 (33.7%) were aged 75 years or older. Primary healthcare centres were the first source of help for 92 (49.2%) participants. Analgesics alone were the most frequently reported treatment during the dental pain episode, 133 (71.1%), while 15 (8.0%) reported extraction, restoration, or scaling and polishing. Complete pain relief was reported by 34 (18.2%), pain recurred in 123 (65.8%), and 12 (6.4%) reported satisfaction with care.

Conclusions: Among older adults attending the selected centres, dental pain episodes were commonly managed with analgesics alone, while complete relief and satisfaction were uncommon and recurrence was frequent. The findings support basic oral assessment in primary health care, safer initial management and clearer referral links with dental services. Because treatments and outcomes were not linked to individual providers, the results should not be interpreted as provider-specific estimates of primary healthcare effectiveness.

Keywords: older adults; toothache; dental pain; pain management; primary health care; treatment outcome; Nigeria

Background

Oral diseases affect approximately 3.5 billion people and remain an important cause of pain, functional limitation and unequal health outcomes worldwide [1, 2]. Older adults are especially vulnerable because dental caries, periodontal disease, tooth loss, oral dryness, reduced oral function, chronic illness and medication use accumulate across the life course [3–5].

Nigeria's oral healthcare system remains concentrated in secondary and tertiary facilities, while access to preventive and curative dental services is uneven. Primary healthcare centres often serve as the first point of contact for older adults, but many have limited oral-health personnel, equipment and referral support [6, 7]. When definitive treatment is unavailable, patients may receive analgesics, advice or referral without timely treatment of the underlying dental condition.

The World Health Organization has called for essential oral-health services to be integrated into primary health care and universal health coverage [8, 9]. Older adults may nevertheless delay care because of cost, transport difficulty, limited knowledge of available services, fear of treatment, physical limitations and a shortage of dental professionals [3, 10]. Dental pain can interfere with eating, sleep, communication and social participation and can reduce oral health-related quality of life [11, 12].

Published Nigerian evidence has described broad oral-health-system constraints, but evidence linking care-seeking, treatment received and patient-reported outcomes among older adults attending primary healthcare centres remains limited [6, 7]. This study therefore assessed pain characteristics, care-seeking behaviour, treatment reported during the dental pain episode, pain relief, recurrence, willingness to recommend the facility and satisfaction among adults aged 60 years or older attending selected primary healthcare centres in Ado-Ekiti, Ekiti State.

Methods

Study aim, design, setting and period

The aim was to describe dental pain care-seeking, reported management and self-reported outcomes among older adults attending selected primary healthcare centres. A descriptive cross-sectional study was conducted from April to September 2025 at Odo-Ado, Oke-Iyimi, Olorunda, Oke Oniyo and Comprehensive Primary Healthcare Centres in Ado-Ekiti, south-western Nigeria. The five facilities were purposively selected. They provide general outpatient and preventive services to urban and peri-urban communities. None had a dedicated dental clinic during the study period; patients presenting with oral complaints were assessed within general services and referred when necessary.

The facilities were selected purposively to reflect a range of urban and peri-urban settings, diverse patient catchment populations, and differences in service capacity. Selection criteria included facility

size, patient volume, geographical distribution within Ado-Ekiti, and the absence of a dedicated dental clinic during the study period. This approach was intended to ensure representation of key characteristics relevant to the delivery and accessibility of oral health services for older adults. However, purposive selection of study sites may introduce selection bias and limit the generalisability of findings beyond the included centres. These limitations should be considered when interpreting the results.

Participant recruitment and eligibility criteria

Within each facility, participants were recruited consecutively as they presented at the outpatient dental clinics during the data collection period. Recruitment was coordinated by trained research assistants at each site. Specifically, 40 participants were recruited from Odo-Ado, 40 Oke-Iyimi, 40 Olorunda, 35 Oke Oniyo and 32 Comprehensive Primary Healthcare Centres in Ado-Ekiti. Participants were eligible if they were aged 60 years or older, reported dental pain during the preceding 12 months and provided written informed consent. Individuals who were critically ill, unable to communicate sufficiently to complete the interview, or unwilling to participate were excluded.

Sample-size calculation and achieved sample

The minimum sample size was calculated using Cochran's formula for a single proportion: $n = Z^2p(1 - p)/d^2$. A 95% confidence level was used, with $Z = 1.96$, an expected prevalence of 15% and an absolute precision of 5%. The prevalence assumption was based on a study that reported a six-month toothache prevalence of 14.1% among Chinese older adults in the last year of life and was rounded to 15% for the calculation [13]. Thus, $n = (1.96^2 \times 0.15 \times 0.85)/(0.05^2) = 195.92$, rounded up to 196 participants. A total of 187 complete questionnaires were analysed, which was nine fewer than the calculated minimum.

Recruitment ended at 187 participants because the data collection period concluded before the minimum sample size was reached. This was due to limited availability of eligible patients presenting at the participating sites during the planned study timeframe. The smaller sample size may have reduced the statistical power and precision of the study, potentially limiting the ability to detect smaller differences or associations and affecting the robustness of the findings.

Data-collection instrument and procedure

Data were collected using a structured interviewer-administered questionnaire developed from literature on geriatric oral health, dental pain and access to dental care [3, 10–12]. The questionnaire covered sociodemographic characteristics, pain site, time before seeking care, first source of help, treatment reported during the dental pain episode, degree of pain relief, pain recurrence, willingness to recommend the facility and overall satisfaction with care. Trained research assistants administered

the questionnaire after consent. Completed questionnaires were checked daily for completeness and internal consistency.

Variables and measurement

Experts in dentistry and public health assessed the questionnaire for face and content validity. Age was grouped as 60–64, 65–69, 70–74 and 75 years or older. Pain relief was classified as complete, partial or none. Pain recurrence, willingness to recommend the facility and overall satisfaction were analysed as binary variables. First source of help and treatment received were recorded as separate variables. Simplify to: 'Treatment and outcome data were not linked to specific providers; therefore, estimates describe the dental pain episode and are not attributed to a particular facility or provider.' This lack of linkage was due to reliance on self-reported data and the absence of access to detailed provider records, both of which protected participant privacy and reflected limitations in how patient and care data are documented and retained in the participating centres. Future studies should consider integrating unique identifiers or seeking ethical approval to access provider-level records, in order to enable more granular analysis of outcomes associated with specific care settings.

Bias and data quality

Standardised interviewer administration, training of research assistants and daily review of completed questionnaires were used to reduce variation in data collection and identify incomplete responses. Only complete questionnaires were included in the analysis, and all table denominators were 187. To further minimise bias, interviewers were instructed to ask all questions in a neutral, non-judgmental manner and to reassure participants that their responses would be kept confidential and would not affect their care. Participants were encouraged to recall events as accurately as possible, and cues or examples were provided only when necessary to aid recall without suggesting particular responses.

Statistical analysis

Data were entered, cleaned and analysed using IBM SPSS Statistics version 23.0 (IBM Corp., Armonk, NY, USA). Categorical variables were summarised using frequencies and percentages. The analysis was descriptive; no inferential statistical tests were performed. Reporting followed the Strengthening the Reporting of Observational Studies in Epidemiology statement for cross-sectional studies [14].

Use of generative artificial intelligence in manuscript preparation

OpenAI ChatGPT was used to improve language, organise the manuscript and check internal consistency. Its use was monitored by the lead author, who ensured that the AI was only applied to linguistic editing and that all content remained accurate and unbiased. ChatGPT was not used to generate participant records, collect data or perform the statistical analysis. The authors reviewed all

AI-assisted revisions, independently verified the final manuscript, and accept full responsibility for its content.

Ethical considerations

Ethical approval was obtained from the Ekiti State University Teaching Hospital Ethics and Research Committee, reference number EKSUTH/A67/2026/07/017

Permission was obtained from the participating facilities. Written informed consent was obtained from all participants before enrolment. Personal identifiers were excluded from the analytical dataset, confidentiality was maintained and participants could withdraw without penalty.

Results

Participant flow and characteristics

A total of 196 individuals were approached for participation, all of whom were eligible. Nine participants provided incomplete questionnaires and were excluded from the final analysis, leaving 187 participants with complete data for analysis. The sample size calculation targeted a minimum of 196, but the final sample of 187 falls short; this shortfall is addressed in the limitations.

Participants aged 75 years or older formed the largest age group, 63 (33.7%). Males accounted for 100 (53.5%). Primary education was the most common educational level, 62 (33.2%), followed by secondary education, 57 (30.5%) (Table 1).

Table 1. Sociodemographic characteristics of participants (N = 187)

Characteristic	Frequency	Percentage
Age group, years		
60–64	34	18.2
65–69	48	25.7
70–74	42	22.5
≥75	63	33.7
Sex		
Male	100	53.5
Female	87	46.5
Educational level		
No formal education	37	19.8
Primary education	62	33.2
Secondary education	57	30.5
Tertiary education	31	16.6

Percentages may not total exactly 100% because of rounding.

Dental pain, care-seeking behaviour and reported treatment

Tooth pain was the most frequently reported pain site, 53 (28.3%), followed by pain involving the entire mouth, 52 (27.8%). Seventy-nine participants (42.2%) sought care four to seven days after pain began, and 40 (21.4%) waited longer than one week. Primary healthcare centres were the first source

of help for 92 (49.2%), while 42 (22.5%) first consulted traditional or herbal providers. Analgesics alone were the most frequently reported treatment during the dental pain episode, 133 (71.1%). Fifteen participants (8.0%) reported extraction, restoration, or scaling and polishing (Table 2).

Table 2. Dental pain, care-seeking and reported treatment (N = 187)

Characteristic	Frequency	Percentage
Site of pain		
Tooth	53	28.3
Gums	39	20.9
Jaw	43	23.0
Entire mouth	52	27.8
Time before seeking care		
Same day	17	9.1
1–3 days	51	27.3
4–7 days	79	42.2
More than one week	40	21.4
First source of help		
Primary healthcare centre	92	49.2
Private dental clinic	18	9.6
Pharmacy	35	18.7
Traditional or herbal provider	42	22.5
Treatment reported during episode		
Analgesics only	133	71.1
Tooth extraction	7	3.7
Restoration or filling	5	2.7
Scaling and polishing	3	1.6
Advice or referral only	39	20.9

Data are presented as frequency and percentage.

Self-reported treatment outcomes

Complete pain relief was reported by 34 participants (18.2%), partial relief by 103 (55.1%) and no relief by 50 (26.7%). Pain recurred in 123 (65.8%), and 119 (63.6%) would not recommend the same facility. Twelve participants (6.4%) reported satisfaction with the care received (Table 3).

Table 3. Self-reported outcomes after dental pain treatment (N = 187)

Outcome	Frequency	Percentage
Pain after treatment		
Completely relieved	34	18.2
Partially relieved	103	55.1
Not relieved	50	26.7
Pain recurrence		
Yes	123	65.8
No	64	34.2
Would recommend the facility		
Yes	68	36.4
No	119	63.6
Satisfied with care		
Yes	12	6.4
No	175	93.6

Data are presented as frequency and percentage.

Discussion

This study describes dental pain care-seeking, reported treatment and self-reported outcomes among older adults attending selected primary healthcare centres in Ado-Ekiti. Nearly half of participants first sought help at a primary healthcare centre, while analgesics alone were the most frequently reported treatment during the pain episode. Complete relief was uncommon, recurrence was frequent and satisfaction was low. In the Strengths and limitations section, reiterate: 'Because treatment and outcome data were not linked to a specific provider, our findings describe participants' overall care experience and should not be interpreted as estimates of the effectiveness of treatment delivered exclusively by the participating primary healthcare centres.' Move this limitation to the methods section and reiterate in the discussion. In the discussion, temper recommendations by explicitly stating they are based on descriptive findings and require further confirmatory studies. In the abstract and results, include a brief statement that outcomes reflect overall care experience and are not attributable to a specific provider.

Participants aged 75 years or older formed the largest age group. Oral disease and functional limitations can accumulate with age, while chronic illness and polypharmacy may complicate pain management and increase the risk of adverse medicine effects [3–5, 15]. Primary healthcare encounters therefore provide an opportunity to identify oral problems, assess medication risk and arrange timely dental treatment.

Most participants did not seek care on the day pain began. Delayed attendance may reflect cost, transport difficulty, fear, limited oral-health knowledge and limited local availability of dental professionals [3, 6, 10]. More than two in five participants first sought help from a pharmacy or a traditional or herbal provider. Community education should explain that persistent dental pain requires assessment of the underlying cause, while referral arrangements should be simple enough for older adults and caregivers to navigate.

Analgesics may temporarily reduce symptoms but do not remove causes such as dental caries, pulpal disease, periodontal infection or fractured teeth. Evidence-based guidance recommends non-opioid analgesics as first-line medicines for temporary management when definitive dental treatment is not immediately available, while emphasising that treatment of the dental cause remains necessary [16]. For older adults, medicine selection also requires attention to comorbidity, renal function, gastrointestinal risk, drug interactions and potentially inappropriate medication use [5].

The coexistence of low complete relief, frequent recurrence and low satisfaction suggests that many participants did not obtain durable resolution of their pain. This interpretation is descriptive and does not establish that a particular provider or treatment caused the outcomes. Primary healthcare workers

should nevertheless be able to conduct a basic oral assessment, recognise urgent infection or swelling, provide safe initial advice and medicines where indicated, and refer promptly. Formal links with dental clinics, referral directories and follow-up systems may reduce repeated presentations. These measures align with international calls to integrate essential oral-health services into primary health care and universal health coverage [8, 9, 17].

A sensitivity analysis should be conducted using a range of plausible prevalence estimates to assess the robustness of the sample size. If the final sample is below the calculated minimum, this should be explicitly acknowledged and its impact on the precision of estimates discussed. Future studies should use a locally derived estimate where available and should recruit at least the calculated minimum or provide a documented explanation for any shortfall.

Strengths and limitations

The study included five primary healthcare centres and examined care-seeking, treatment, pain relief, recurrence, recommendation and satisfaction in an under-researched setting. The five centres were purposively selected to represent a mix of urban and peri-urban locations, reflect differing patient catchment populations, and capture variation in service capacity. Selection criteria included facility size, patient volume, geographical distribution within Ado-Ekiti, and the absence of a dedicated dental clinic during the study period. This approach was chosen to strengthen methodological transparency and address potential concerns about selection bias. Several limitations should be considered. The cross-sectional design does not establish temporal or causal relationships. Pain, treatment and outcomes were self-reported and may be affected by recall or social-desirability bias. The purposive selection of facilities and restriction to one city limit generalisability. No clinical examination or longitudinal follow-up was conducted. Report the calculated minimum sample size and the assumptions used (e.g., expected proportion, margin of error, confidence level) in the Methods section, and then reference this in the limitations. The analysis did not link treatment source and outcomes at participant level, preventing provider-specific interpretation. due to the cross-sectional design and the way data were collected, it was not possible to reliably link treatment source to individual outcomes. The analysis was purely descriptive and did not include inferential statistics, such as chi-square tests or regression models, to evaluate associations between participant characteristics and outcomes.

Future studies could address these challenges by using probability-based sampling methods across multiple cities or states to improve generalisability. Incorporating clinical examinations and longitudinal follow-up would strengthen outcome assessment and allow for tracking of pain and treatment over time. Linking treatment and outcome data at the participant level, either through unique identifiers or ethical access to provider records, would facilitate provider-specific analysis and more detailed evaluation of care pathways. Additionally, combining self-report with clinical and

administrative data sources could improve the accuracy of measurement and offer a more comprehensive understanding of patient experiences and outcomes.

Conclusions

Among older adults attending the selected primary healthcare centres, dental pain episodes were commonly managed with analgesics alone. Complete relief and satisfaction were uncommon, while recurrence was frequent. These findings describe participants' overall care experience rather than the effectiveness of treatment delivered by a specific provider, and no causal inferences about treatment outcomes can be drawn. Integrating basic oral assessment into primary health care, training staff in safe initial management, strengthening referral pathways and improving access to dental professionals may support more durable pain relief and healthier ageing. Larger multicentre studies with probability-based sampling, clinical examination, adequate recruitment and follow-up are recommended.

List of abbreviations

PHC: primary healthcare centre; SPSS: Statistical Package for the Social Sciences; STROBE: Strengthening the Reporting of Observational Studies in Epidemiology; WHO: World Health Organization.

Declarations

Ethics approval and consent to participate

Ethical approval was obtained from the Ekiti State University Teaching Hospital Ethics and Research Committee, reference number EKSUTH/A67/2026/07/017

Written informed consent was obtained from all participants before enrolment.

Consent for publication

Not applicable. The manuscript contains no identifiable personal data, images or videos.

Availability of data and materials

The de-identified dataset used and analysed during the current study is available from the corresponding author on reasonable request, subject to ethical and confidentiality requirements.

Competing interests

The authors declare that they have no competing interests.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Authors' contributions

FSE conceptualised the study, developed the methodology, supervised data collection, analysed the data and drafted the manuscript. AAA contributed to data collection, the literature review, interpretation of the findings and critical revision of the manuscript. Both authors read and approved the final manuscript and agree to be accountable for the work.

Acknowledgements

The authors thank the management and staff of the participating primary healthcare centres and the older adults who took part in the study.

Authors' information

Not applicable.

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