

Prevalence and Determinant of Dental Caries Among Children in Selected Primary Schools in Ilorin West Local Government Area, Kwara State

Usman Ndabata Abdullahi

usikul2233@gmail.com

National Open University

Oladimeji Lateefah Olabisi

Al-Hikmah University

Balogun Abdulqudus Olaitan

Al-Hikmah University

Research Article

Keywords: Dental caries, logistic regression analysis, descriptive cross-sectional, oral hygiene, primary school children

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**PREVALENCE AND DETERMINANT OF DENTAL CARIES AMONG CHILDREN
IN SELECTED PRIMARY SCHOOLS IN ILORIN WEST LOCAL GOVERNMENT
AREA, KWARA STATE.**

Abdullahi Usman Ndabata¹, Oladimeji Lateefah Olabisi² and Balogun Abdulqudus Olaitan³

¹Department of Public Health, Faculty of Health Sciences, National Open University, Abuja,
Nigeria

ORCID: <https://orcid.org/0009-0008-1825-9607>

²Department of Community Medicine and Public Health, Faculty of Basic Medical Sciences,
College of Health Sciences, Al-Hikmah University, Ilorin, Nigeria

ORCID: <https://orcid.org/0000-0002-0915-7587>

³Department of Community Medicine and Public Health, Faculty of Basic Medical Sciences,
College of Health Sciences, Al-Hikmah University, Ilorin, Nigeria

ORCID: <https://orcid.org/0009-0001-6666-8658>

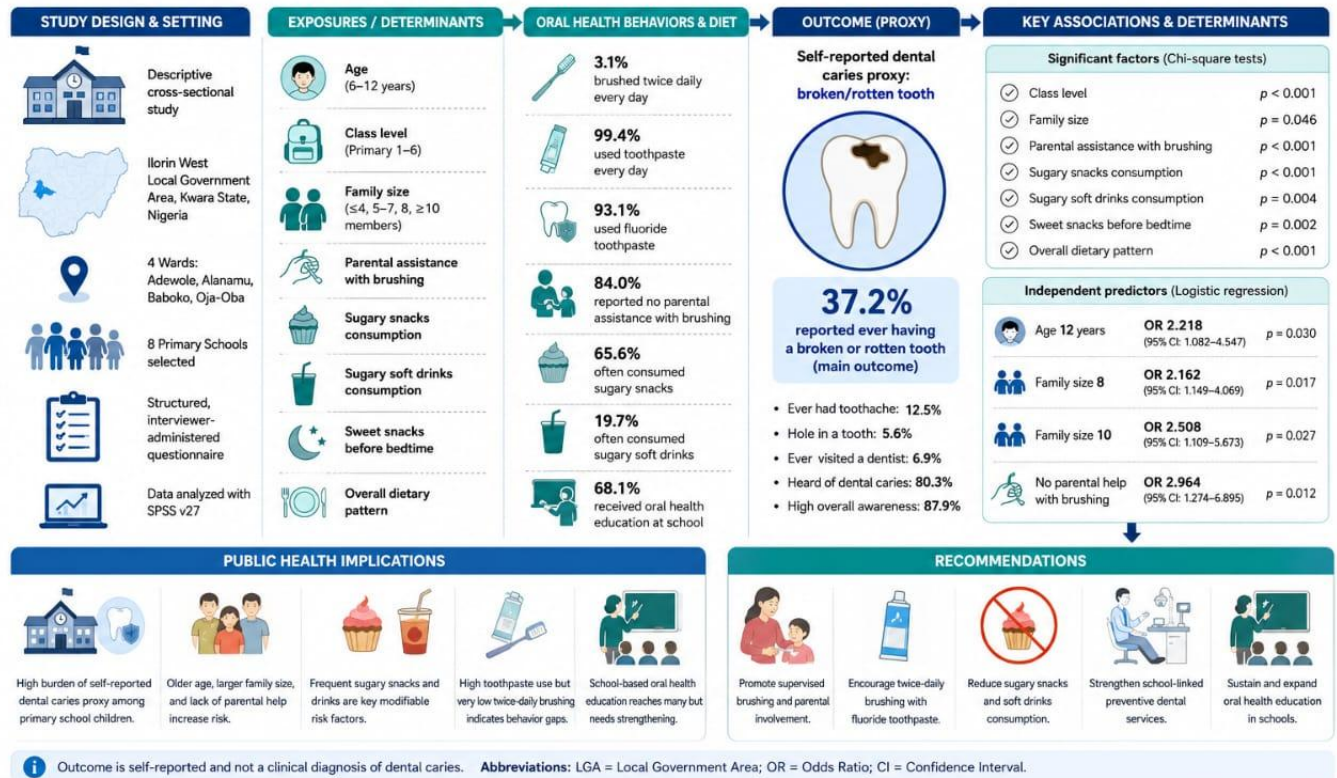
Corresponding author: Abdullahi Usman Ndabata

Email: usikul2233@gmail.com

Graphical Abstract

Prevalence and Determinants of Dental Caries (Self-reported Proxy) among Children in Selected Primary Schools in Ilorin West LGA, Kwara State

A school-based cross-sectional study (N = 320; ages 6–12 years)



Graphical Abstract. Study design, key findings, independent predictors and public-health implications. The principal outcome is a self-reported history of a broken or rotten tooth and is not equivalent to a clinical diagnosis of dental caries.

Note: The graphical abstract was generated with Biorender

ABSTRACT

Background: Dental caries is one of the most common chronic oral diseases affecting children and remains a major public health concern worldwide. Poor oral hygiene practices, frequent consumption of sugary foods, inadequate fluoride use, and limited access to preventive dental care increase the risk of dental caries. This study assessed the prevalence and determinants of dental caries among primary school children in Ilorin West Local Government Area, Kwara State.

Methodology: A descriptive cross-sectional study was conducted among 320 primary school children selected using a multistage sampling technique. Data were collected using a structured interviewer-administered questionnaire. Data were analyzed using SPSS version 27. Descriptive statistics were summarized using frequencies and percentages, while Chi-square and logistic regression analysis were performed at a 5% level of significance.

Results: The prevalence of self-reported dental caries among respondents was 37.2%. Only 6.9% had ever visited a dentist for a tooth-related problem, while preventive oral hygiene practices were generally poor despite high awareness of dental caries. Frequent consumption of sugary snacks was also reported. Chi-square analysis showed that class level ($p<0.001$), family size ($p=0.046$), and parental assistance with tooth brushing ($p<0.001$) were significantly associated with dental caries. Logistic regression identified age (12 years), larger family size, and lack of parental assistance with tooth brushing as significant predictors of dental caries ($p<0.05$).

Conclusion: Dental caries remains a significant oral health problem among primary school children in Ilorin West Local Government Area. Strengthening school-based oral health education, improving parental involvement in oral hygiene practices, promoting fluoride toothpaste use, reducing sugary snack consumption, and improving access to preventive dental services are recommended.

Keywords: *Dental caries; logistic regression analysis; descriptive cross-sectional; oral hygiene, primary school children.*

1.0 INTRODUCTION

Dental caries is commonly referred to as tooth decay or cavities and remains one of the most prevalent chronic diseases affecting children worldwide. It is a multifactorial disease resulting from the interaction between host factors (such as teeth and saliva), dietary sugars and microbial flora particularly *Streptococcus mutans* and *Lactobacillus* species (Spatafora *et al.*, 2024). Dental caries is an underdiagnosed health problem of which majority of children and adults are victims of the disease. In the Global Burden of Disease, untreated caries was the most prevalent of all 291 medical conditions which is affecting 3.1 billion individuals (Qin *et al.*, 2022). It has a major impact on quality of life and increases out-of-pocket costs for individuals, families and nation at large. The disease burden varies across populations and often influenced by socioeconomic factors in close relation with other conditions associated with non-communicable diseases (Odunyemi *et al.*, 2023). Dental caries results from the combination of genetic, physiological, behavioral and environmental factors. In last 30 years, the prevalence of dental caries continually increases despite been a preventable disease (Pitts *et al.*, 2021). Dental caries is a complex multifactorial disease which is characterized by demineralization of the enamel, dentine and cementum which are dental hard tissues and affects both childhood and permanent teeth (Warreth, 2023).

The elements that determine the development of dental caries are bacterial biofilm (plaque), fermentable carbohydrates, dental hard tissue and time. Furthermore, personal and oral environmental factors significantly contribute to its occurrence (Rathee & Sapra, 2023). Complex assessment is essential for dental caries purposely to evaluate caries risk and carious lesion activity to determine focused treatment plans which may vary depending on

individual's dental practices. For instance, zirconia crowns (ZCs) are being used due to their acceptable efficacy and aesthetic acceptance compared to the traditionally used stainless steel crowns (SSCs) for primary teeth restoration (Qin *et al.*, 2022). Among these determinants are poor oral hygiene, high sugar consumption, inadequate parental supervision, low educational levels, lack of fluoride in drinking water or toothpaste and limited access to dental services (Shomuyiwa, 2023). Caries has adverse effects on both oral and general health of children and its occurrence among affected individuals are often attributed to diet, oral hygiene, feeding practices, low birth weight, hereditary enamel defects, oral health knowledge, attitude and practice, household income level, sociocultural and economic factors (Koberova *et al.*, 2021). Assessment of the prevalence and determinants of dental caries in schoolchildren is crucial to enable targeted oral health interventions as schools provide a strategic setting for the promotion of health education, early diagnosis and preventive care (Odunyemi *et al.*, 2023).

According to the World Health Organization, approximately 3.7 billion people are affected by oral diseases, with untreated dental caries being the most common health condition globally (WHO, 2023). The burden of dental caries is disproportionately higher in low- and middle-income countries (LMICs), where the prevalence among children ranges from 40% to 70%, compared with 1% to 12% in many high-income countries (Yousaf *et al.*, 2022). Preventive measures such as regular brushing with fluoride toothpaste, reduced sugar consumption, routine dental check-ups, and community water fluoridation have been shown to reduce the occurrence of dental caries by 14% to 35% (Oyapero *et al.*, 2020). However, only about 60% of the global population has access to essential oral healthcare services, leaving many

children at risk of preventable oral diseases (WHO, 2022). A recent systematic review and meta-analysis by Akinsolu *et al.* (2026) reported an overall pooled prevalence of dental caries of 17% among Nigerians, with a higher prevalence of 22% observed in rural communities compared with 14% in urban settings. The review further highlighted substantial regional disparities and emphasized that limited preventive oral health services, poor oral hygiene practices, and socioeconomic inequalities contribute significantly to the burden of dental caries. Similarly, Onyejaka *et al.* (2021) reported a dental caries prevalence of 22.7% among primary school children in South-East Nigeria and identified poor oral hygiene and enamel defects as significant predictors of dental caries. Issa *et al.* (2026) reported that although over 80% of school children had heard of dental caries, preventive practices remained poor, with only 3.1% brushing their teeth twice daily, 6.9% ever visiting a dental clinic, and 65.6% frequently consuming sugary snacks. The study also found that class level, family size, and parental assistance with tooth brushing were significantly associated with dental caries experience (Issa *et al.*, 2026). These findings indicate that awareness alone does not necessarily translate into appropriate oral health practices, particularly among school-aged children.

Dental caries remains one of the most common chronic oral diseases affecting children and has adverse consequences on nutrition, speech, growth, self-esteem, school attendance, and academic performance (Bassa *et al.*, 2023).

Furthermore, by identifying behavioral and environmental risk factors associated with dental caries, the study may contribute to the development of evidence-based interventions aimed at improving the oral health and overall well-being of primary school children (Mazurkiewicz *et*

al., 2023). This study aims to examine the prevalence and determinants of dental caries among school-going children in Ilorin West LGA to strengthen community-based oral health programs.

2.0 RESEARCH METHODOLOGY

2.1 Study Area Description

Ilorin West Local Government Area is one of the sixteen Local Government Areas in Kwara State, located in the North-Central geopolitical zone of Nigeria, with its administrative headquarters in Oja-Oba, Ilorin. It is one of the three metropolitan Local Government Areas that make up Ilorin, alongside Ilorin East and Ilorin South. Major communities within Ilorin West LGA include Oja-Oba, Adewole, Alanamu, Baboko, Ogidi, Adeta, Taiwo, Warah-Oja, Badari, Sabo-Oke, Oloje, Abayawo, and parts of the University of Ilorin axis. It lies between Latitude 8°24'N and 8°36'N and Longitude 4°28'E and 4°39'E, covering a total land area of approximately 105 km². The Local Government Area has an estimated population of 364,666 people and is predominantly inhabited by the Yoruba ethnic group, although it is cosmopolitan with people from other ethnic backgrounds. According to the Kwara State Universal Basic Education Board (KWSUBEB), Ilorin West LGA has approximately 82 public primary schools with an estimated 43,000 pupils enrolled. The area is also served by numerous public and private health facilities, including primary healthcare centres, secondary health facilities, and dental clinics, providing preventive and curative oral health services.

2.2 Advocacy/Community Entry

Approval for the study was obtained from the Department of Public Health, Al-Hikmah University, Ilorin, and an introductory letter was presented to the relevant authorities, including the Ilorin West Local Government Education Authority (LGEA), the Kwara State Universal Basic Education Board (KWSUBEB), and the head teachers of the selected primary schools in Ilorin West Local Government Area, Kwara State. Advocacy visits were conducted to secure the support and cooperation of key stakeholders and to facilitate the

smooth implementation of the study while ensuring compliance with ethical standards. Permission was sought from the relevant education authorities to conduct the study, while approval was obtained from the head teachers of the selected schools to access the school premises, interact with the pupils, administer the questionnaires, and carry out data collection without disrupting normal academic activities.

2.3 Study Design

A descriptive cross-sectional study design was employed to assess the prevalence and determinants of dental caries among primary school children in Ilorin West LGA, Kwara State. Data collection was carried out through structured interviews and survey questionnaires administered to participants within the study area.

2.4 Study Population

The study population comprises school children aged 6 years and above, in various primary school classes, in both public and private primary schools in Ilorin West Local Government Area of Kwara State, Nigeria.

2.5 Inclusion Criteria

Children aged 6–12 years currently enrolled in selected public and private primary schools within Ilorin West Local Government Area, who are present during the period of the survey and who consented to participate in the study and would be willing to undergo oral examination, were included in the study.

2.6 Exclusion Criteria

Children outside the 6–12-year age range and those with a history of systemic disease or mental health problems that may affect the research findings, those who are absent on the day of the survey or those who decline consent or unwilling to allow for an oral examination were excluded from the study.

2.7 Sample Size Determination

The sample size was determined using the Cochran formula for estimating prevalence in cross-sectional studies:

$$n = \frac{z^2 P(1-P)}{d^2}$$

Where:

n = required sample size

z = z -value at 95% confidence level (1.96)

P = estimated prevalence of dental caries from previous study (Issa *et al.*, 2026) = **37.2%**

d = margin of error (5%)

Using a prevalence (P) of 25%, a confidence level of 95% and a 5% margin of error:

$$\text{Sample size}(n) = \frac{(1.96)^2 \times 0.372(1-0.372)}{0.05^2}$$

$$n = \frac{3.8416 \times 0.372 \times 0.628}{0.0025}$$

$$n \approx 359$$

The required sample size is approximately 288. To account for non-response, 10% of the actual sample size will be added giving a final sample size of 317 children.

To compensate for non-response, taken that 90% response is anticipated, the sample size will be calculated using the formula:

$$ns = \frac{nf}{0.90}$$

Where

nf = calculated sample size

ns = sample size to compensate for non response

0.90= taken that 90% response is anticipated

Substituting therefore,

$$ns = \frac{359}{0.90}$$

$$n \approx 399$$

$$n = 400$$

Final sample size of 320 will be used and accordingly, 200 questionnaires will be administered each to public and private primary schools selected for the study to give a total of 400.

2.8 Sampling Technique

A multistage sampling technique was employed to select respondents for this study among primary school pupils in Ilorin West Local Government Area (LGA), Kwara State. The selection process was carried out in the following stages:

Stage 1: Selection of Wards

Four wards were selected using simple random sampling (balloting without replacement) from the existing wards in Ilorin West Local Government Area. The selected wards were Adewole, Alanamu, Baboko, and Oja-Oba.

Stage 2: Selection of Schools

From each of the four selected wards, two primary schools (one public and one private) were selected using simple random sampling by balloting. This resulted in a total of eight (8) primary schools, comprising four public and four private schools. The number of pupils selected from each school was determined using proportionate allocation based on the total pupil population of each selected school.

Stage 3: Proportionate Allocation of Respondents

The sample size allocated to each selected school was further distributed proportionately across the six primary school classes (Primary 1–Primary 6). The number of pupils selected from each class was determined using the formula:

$$N_1 = \frac{n}{N} \times S$$

Where:

- n_1 = Number of pupils to be selected from each class (Primary 1–Primary 6)
- n = Total number of pupils in each class
- N = Total number of pupils in the selected school
- S = Sample size allocated to the school

Stage 4: Selection of Respondents

Systematic random sampling was used to select pupils from each class in the selected schools. The class register served as the sampling frame. The sampling interval (**k**) was determined by dividing the total number of pupils in each class by the number of pupils required from that class. The first respondent was selected randomly, after which every k th pupil on the class register was selected until the required sample size for each class was obtained.

2.9 Research Instrument, Validity and Pretesting

2.9.1 Research Instrument

A structured questionnaire was developed by the researcher based on the study objectives and relevant literature to collect data from primary school pupils in Ilorin West Local Government Area, Kwara State. The questionnaire comprised six sections (A–F) designed to obtain information on the prevalence and determinants of dental caries among the respondents.

Section A: Socio-Demographic Information

This section elicited information on the respondents' background characteristics, including age, sex, class, tribe, religion, family size, father's occupation, mother's occupation, and parental assistance with tooth brushing.

Section B: Prevalence of Dental Caries

This section assessed the prevalence of dental caries among the respondents by obtaining information on previous experiences of toothache, holes in the teeth, broken or rotten teeth, and history of visiting a dentist for tooth-related problems.

Section C: Awareness and Knowledge of Dental Caries

This section assessed respondents' awareness and knowledge of dental caries. It included questions on whether respondents had heard of dental caries, their sources of information, knowledge of the causes of tooth decay, recommended tooth-brushing frequency, the role of tooth brushing in preventing dental caries, and parental assistance with tooth brushing.

Section D: Dietary Patterns

This section examined respondents' dietary habits that may influence the occurrence of dental caries. It included questions on the frequency of consuming sugary snacks, sugary soft drinks, fruits, sweet snacks before bedtime, and dairy products.

Section E: Oral Hygiene Practices

This section evaluated respondents' oral hygiene practices, including frequency of brushing teeth twice daily, use of toothpaste, attendance for routine dental check-ups, use of chewing sticks or other oral cleaning materials, and sharing of toothbrushes.

Section F: Access to Dental Health Services and Fluoride Use

This section assessed respondents' access to dental health services and fluoride use. It included questions on previous visits to dental clinics, frequency of dental visits, sources of treatment for tooth problems, use of fluoride toothpaste, and receipt of oral health education at school.

3.9.2 Validity

To ensure the instrument's validity, it was reviewed by experts in the department of public health including the group's supervisor who assessed the clarity, relevance and

comprehensiveness of the research instrument. The feedback guide necessary revisions to improve content accuracy and alignment with the study goals.

2.9.3 Pretest

The research instrument (structured questionnaire) designed for the study was pre-tested with 10% of the calculated sample size in a selected primary school in Ilorin East LGA, Kwara State to ensure instrument reliability and ascertain validity of the data collection process. Feedback from the pretest was used to refine the questionnaire and ensure its suitability for the main study.

2.9.4 Reliability

Data obtained from the pretest were analyzed using the Cronbach's Alpha reliability test in the Statistical Package for Social Sciences (SPSS) version 27. The instrument yielded a Cronbach's Alpha coefficient of 0.82, indicating good internal consistency and confirming that the questionnaire was reliable for data collection.

2.10 Methods of Data Collection

Data for this study were collected using a structured, close-ended questionnaire designed to obtain information on the prevalence and determinants of dental caries among primary school children in Ilorin West Local Government Area, Kwara State. The questionnaires were administered through face-to-face interviews by the researcher and four (4) trained research assistants. Each questionnaire item was carefully read aloud and explained, where necessary, in a language the pupils could easily understand. The pupils were then allowed to provide their responses freely, which were recorded exactly as stated without any prompting, interpretation, or influence from the interviewer.

2.11 Measurement of Variables and Data Processing

The dependent variable is the prevalence of dental caries, measured using a yes/no response based on reported or observed symptoms. The independent variables include knowledge, oral hygiene practices, dietary patterns access to dental health services and fluoride use. Knowledge/awareness was evaluated through structured questions categorized as adequate or inadequate based on correct responses. Oral hygiene practices were assessed by frequency and quality of brushing, use of fluoride toothpaste and dental visits and was classified as good, moderate or poor. Dietary patterns were measured by the frequency of sugary food and drink intake and categorized into high-risk, moderate-risk or low-risk groups. Access to dental health services was evaluated by the availability, affordability and utilization of services and categorized as either good or limited access. Fluoride use was assessed based on awareness and regular use of fluoride-containing products and grouped into adequate or inadequate use.

2.12 Methods of Data Management and Analysis

Data collected from survey questionnaires was entered into a secure database and analyzed using IBM Statistical Package for Social Sciences (SPSS) version 27. Data were presented using frequency distribution tables and charts. Chi-square tests were used to examine relationships and associations between variables. Descriptive statistics such as frequency distributions and measures of central tendency was used to summarize the data. All analyses were conducted at a 95% confidence interval with a significance level set at $p < 0.05$.

2.13 Consent/Methods of Protection of Human Subjects

Informed consent was obtained from all the respondents before inclusion in the study. Respondents were informed of their right to decline or withdraw from the study at any time without any adverse consequences. Participants' confidentiality was respected and maintained by ensuring that no unauthorized person has access to the information on the data information sheets and that no information can be traced to the subjects.

2.14 Ethical Considerations

Ethical approval for the study was obtained from Ethical Review Committee of the Al-Hikmah University, Ilorin. The approval letter was then presented to all the necessary stakeholders before carrying out the study, while the purpose of the research was explained to each respondent and verbal informed consent obtained from them before inclusion into the study. Also, anonymity of the respondents was assured and ensured.

2.15 Limitations of the Study

Limitations of the study include potential biases associated with self-reported data. Additionally, the generalizability of findings may be constrained by the specific characteristics of the study population including primary school settings and access to oral health services in Ilorin West LGA which may limit the applicability/replicability of the research findings as to other LGAs' in Kwara state. To minimize potential biases associated with self-reported data, the study used validated and pretested structured questionnaires and researchers ensured clarity and consistency in administering the tools. Where possible, clinical verification of dental caries was conducted to complement self-reports. To improve the generalizability of the findings, a multistage sampling technique was used to select

diverse schools across different communities within Ilorin West LGA to represent varied socioeconomic backgrounds and access to oral health services. Additionally, the study clearly described the population characteristics to help contextualize the findings and guide cautious interpretation when applying results to other regions in Kwara State.

3.0 RESULTS

The study aimed to assess the prevalence and determinants of dental caries among children in selected primary schools in Ilorin West Local Government Area, Kwara State, Nigeria. Of the 400 questionnaires distributed, 320 were duly completed and returned, yielding a 100% response rate. Univariate analysis was presented using frequency tables, means, and standard deviations, while bivariate and multivariate relationships were illustrated in tabular format. The first section of the findings presents the demographic characteristics of the respondents, while the subsequent sections present findings in line with the study objectives.

Section A: Socio-demographic Information of Respondents

Table 3.1: Demographic Profile of Respondents

Variable	Frequency(n=320)	Percent(%)
Age (Years)		
6	58	18.1
8	44	13.9
10	87	27.1
11	33	10.4
12	98	30.6
Sex		
Female	260	81.3
Male	60	18.8
Tribe		
Yoruba	281	87.8
Hausa	26	8.0
Igbo	0	0.0
Fulani (Others)	13	4.2
Religion		
Islam	231	72.2
Christianity	89	27.8
Traditional	0	0.0
Family Size (Household Members)		
4	7	2.1
5	80	25.0

6	67	20.8
8	133	41.7
10	33	10.4
Mother's Occupation		
Trader	170	53.0
Farmer	64	20.0
Civil Servant	32	10.0
Self-employed	54	17.0
Father's Occupation		
Trader	80	25.0
Farmer	64	20.0
Civil Servant	128	40.0
Self-employed	48	15.0

The socio-demographic characteristics showed that the majority of the respondents were female (260; 81.3%), while 60 (18.8%) were male. Most respondents were aged 12 years (98; 30.6%) and 10 years (87; 27.1%). By class, the highest proportion were in Primary 2 (84; 26.4%), followed by Primary 1 (64; 20.1%). The majority of the respondents were Yoruba (281; 87.8%), while 26 (8.0%) were Hausa and 13 (4.2%) were Fulani. Most respondents were Muslims (231; 72.2%), whereas 89 (27.8%) were Christians. Regarding family size, 133 (41.7%) came from households with eight members, followed by 80 (25.0%) from households with five members. The majority of mothers were traders (170; 53.0%), while most fathers were civil servants (128; 40.0%).

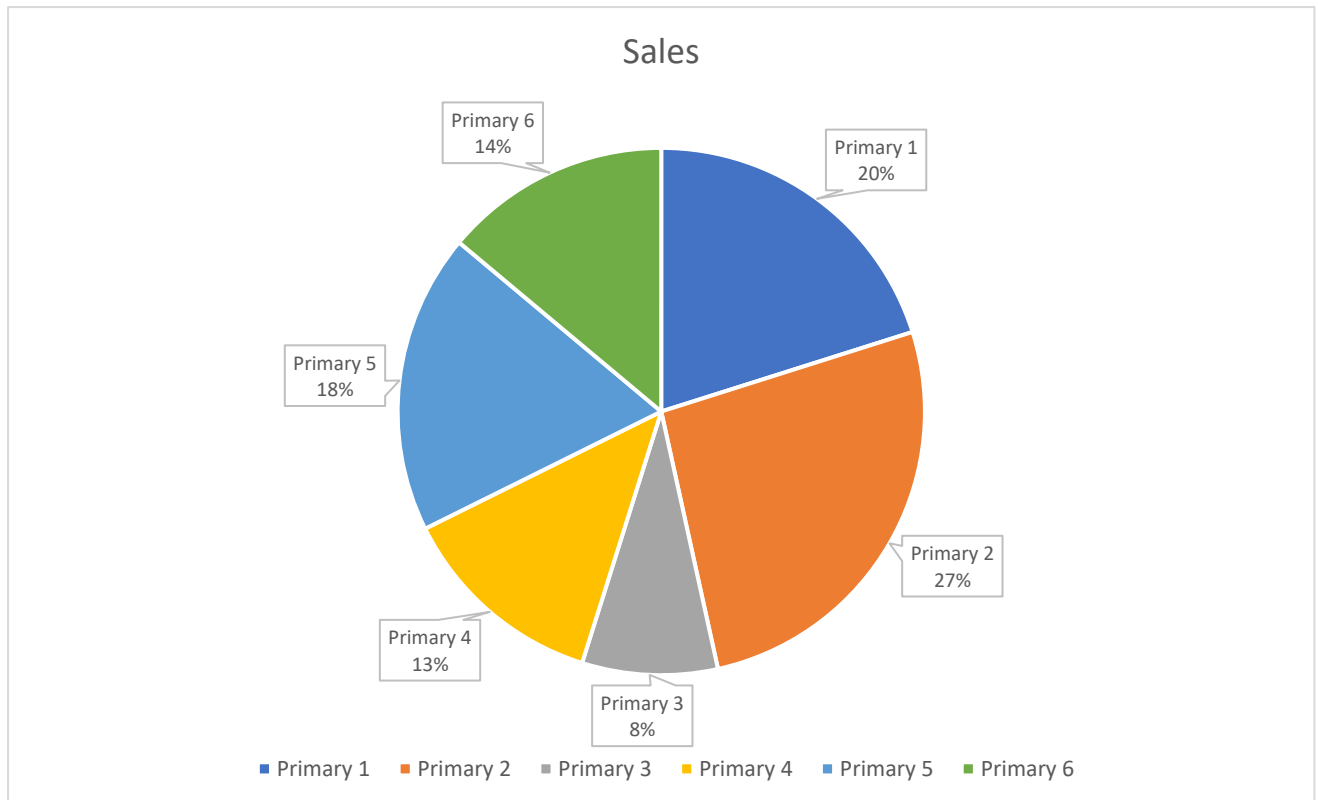


Fig. 3.1: Pie Chart showing Class Distribution of Respondents

SECTION B: Prevalence of Dental Caries and Tooth-Related Experiences

Table 3.2: Assessment of the Prevalence of Dental Caries among Respondents (N = 320)

Variable	Yes (%)	No (%)
Have you ever had a toothache?	40 (12.5%)	280 (87.5%)
Have you ever had a hole in your tooth?	18 (5.6%)	302 (94.4%)
Have you ever had a broken or rotten tooth?	119 (37.2%)	201 (62.8%)
Have you ever visited a dentist for any tooth-related problem?	22 (6.9%)	298 (93.1%)

The findings in Table 3.2 indicate that 40 (12.5%) of the respondents had experienced a toothache, while the majority, 280 (87.5%), had never experienced one. Similarly, only 18 (5.6%) reported having had a hole in their tooth, whereas 302 (94.4%) had never experienced this condition. However, 119 (37.2%) of the respondents reported having had a broken or rotten tooth, while 201 (62.8%) had not. Furthermore, only 22 (6.9%) had visited a dentist for a tooth-related problem, whereas the vast majority, 298 (93.1%), had never sought dental care.

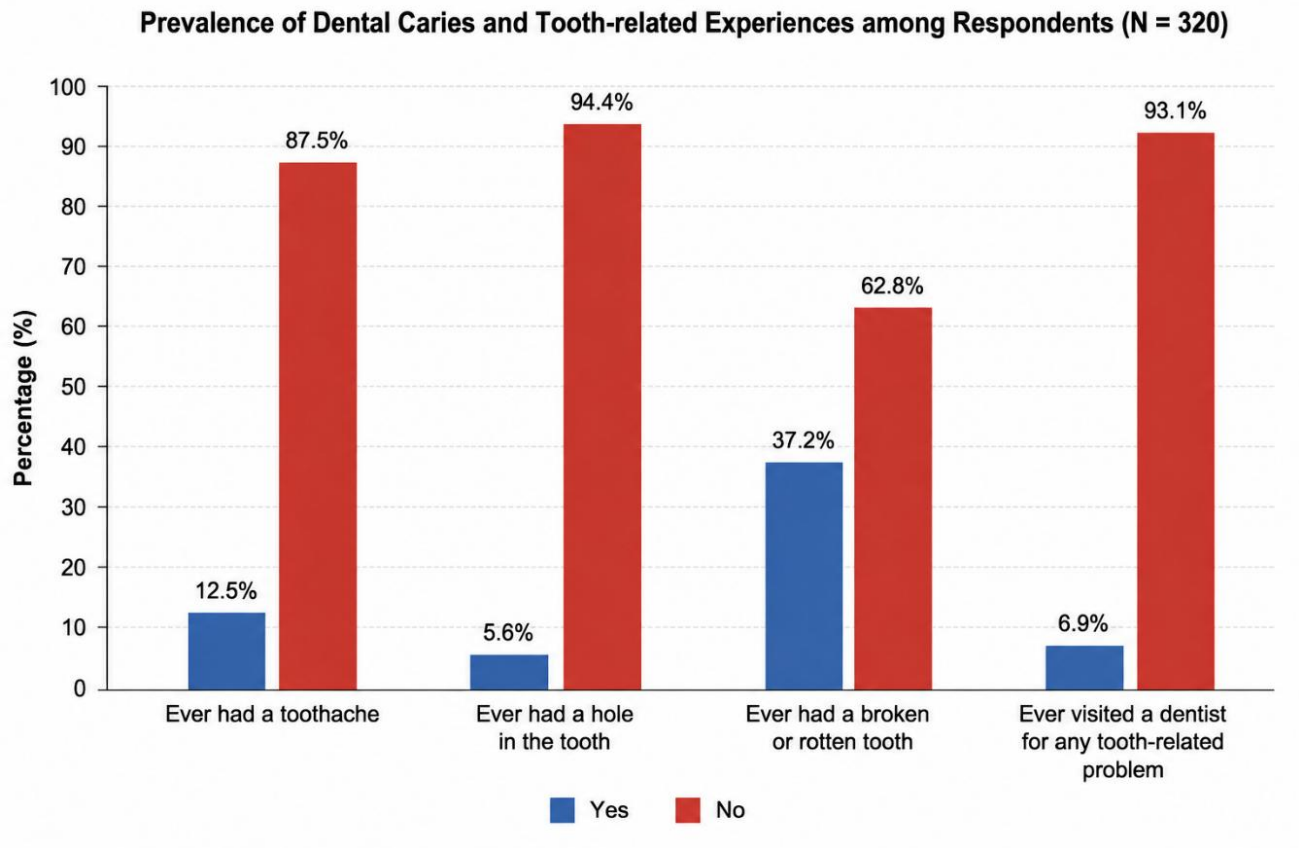


Fig. 3.2: Clustered Bar Chart of Dental Caries and Tooth-related Experiences among Respondents

SECTION C: Awareness and Knowledge of Dental Caries

Table 3.3: Awareness and Knowledge of Dental Caries among Respondents

Variable	Frequency	Percent
Have you heard of dental caries or tooth decay?		
Yes	257	80.3
No	63	19.7
If YES, what is the source of your information? <i>(Based on 257 respondents)</i>		
Parent	20	7.8
Radio/Television	0	0.0
School Teacher	72	28.0
Internet/Social Media	0	0.0
Health Worker	0	0.0
Friends/Family	228	88.7
What do you think causes tooth decay?		
Not brushing teeth	117	36.6
Eating too many sweets	121	37.8
Germ in the mouth	0	0.0
Don't know	82	25.6
How often should you brush your teeth?		
Once a day	224	70.0
Twice a day	96	30.0
Only when dirty	0	0.0
Don't know	0	0.0

Can brushing teeth prevent tooth decay?		
Yes	284	88.8
No	0	0.0
Don't know	36	11.2
Do your parents or guardians help you brush your teeth?		
Yes	51	16.0
No	269	84.0
Overall Awareness of Dental Caries		
High	281	87.9
Low	39	12.1

Table 3.3 shows that the majority of the respondents, 257 (80.3%), had heard of dental caries or tooth decay, while 63 (19.7%) had not. Among those who had heard of dental caries, the major source of information was friends or family (228; 88.7%), followed by school teachers (72; 28.0%) and parents (20; 7.8%), while none reported obtaining information from radio/television, the internet/social media, or health workers. Regarding knowledge of the causes of tooth decay, 121 (37.8%) identified eating too many sweets as a cause, 117 (36.6%) identified not brushing the teeth, while 82 (25.6%) did not know the cause. None of the respondents identified germs in the mouth as a cause of tooth decay. With respect to tooth-brushing frequency, 224 (70.0%) believed that teeth should be brushed once daily, while 96 (30.0%) indicated twice daily. Furthermore, the majority of respondents, 284 (88.8%), believed that brushing the teeth can prevent tooth decay, whereas 36 (11.2%) were unsure. Concerning parental support, 269 (84.0%) reported that their parents or guardians did not assist them with brushing their teeth, while only 51 (16.0%) received such assistance.

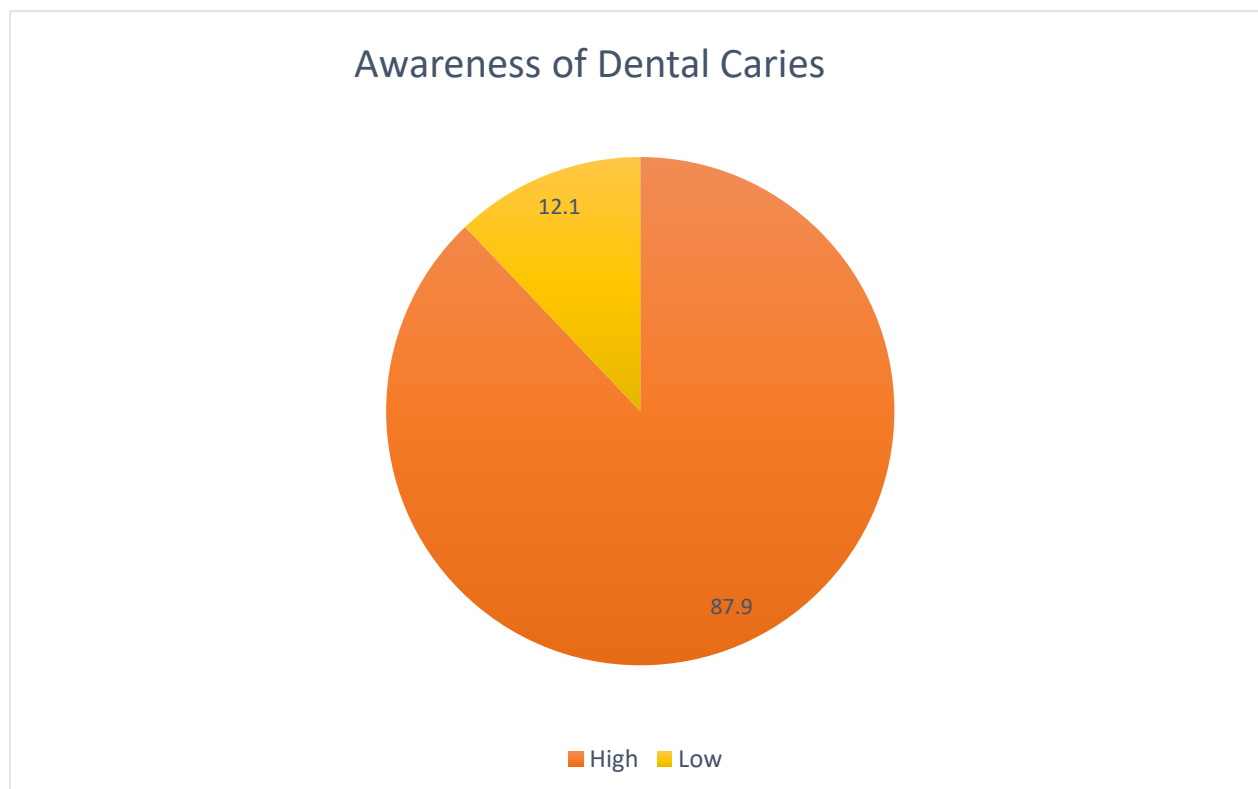


Fig. 3.3: Pie Chart of Dental Caries Awareness among Primary School Children in Ilorin West LGA, Kwara State.

SECTION D: Oral Hygiene Practices

Table 3.4: Assessment of Respondents' Oral Hygiene Practices (N = 320)

Statements	Everyday	Often	Rarely	Never
I brush my teeth twice a day	10 (3.1%)	8 (2.5%)	107 (33.4%)	195 (61.0%)
I use toothpaste when brushing	318 (99.4%)	2 (0.6%)	0 (0.0%)	0 (0.0%)
I visit a dentist for check-ups	0 (0.0%)	0 (0.0%)	4 (1.3%)	316 (98.7%)
I use chewing sticks or other materials	216 (67.5%)	0 (0.0%)	101 (31.5%)	3 (1.0%)
I share my toothbrush with others	8 (2.5%)	0 (0.0%)	0 (0.0%)	312 (97.5%)
Level of Oral Hygiene Practices				
Good	192 (60.0)			
Bad	128 (40.0)			

Table 3.4 presents the oral hygiene practices of the respondents. The findings revealed that the majority of the respondents 318 (99.4%) reported using toothpaste every day when brushing their teeth, while only 2 (0.6%) used toothpaste often. However, only 10 (3.1%) brushed their teeth twice daily every day, 8 (2.5%) did so often, 107 (33.4%) brushed twice daily rarely, whereas the majority, 195 (61.0%), never brushed their teeth twice a day. With regard to dental visits, almost all respondents 316 (98.7%) reported never visiting a dentist for routine check-ups, while only 4 (1.3%) visited rarely. Furthermore, 216 (67.5%) of the respondents reported using chewing sticks or other materials every day, whereas 101 (31.5%) used them rarely and 3 (1.0%) never used them. The vast majority of respondents 312 (97.5%) reported never sharing their toothbrush with others, while only 8 (2.5%) shared theirs every day.

SECTION E

Table 3.5: Assessment of Respondents' Dietary Patterns (N = 320)

Statements	Often	Rarely	Never
I eat sugary snacks like sweets, biscuits, chocolates	210 (65.6%)	66 (20.6%)	44 (13.8%)
I take sugary soft drinks (e.g., soda, juice)	63 (19.7%)	49 (15.3%)	208 (65.0%)
I eat fruits like oranges, bananas, apples	57 (17.8%)	208 (65.0%)	55 (17.2%)
I take sweet snacks before bedtime	0 (0.0%)	64 (20.0%)	256 (80.0%)
I consume dairy products like milk, cheese, yoghurt	56 (17.5%)	56 (17.5%)	208 (65.0%)

Table 3.5 revealed that 210 (65.6%) of the respondents often consumed sugary snacks such as sweets, biscuits, and chocolates, while 66 (20.6%) consumed them rarely and 44 (13.8%) never consumed them. Regarding sugary soft drinks, the majority of respondents, 208 (65.0%), never consumed sugary beverages, whereas 63 (19.7%) consumed them often and 49 (15.3%) consumed them rarely. With respect to fruit consumption, 208 (65.0%) of the respondents rarely ate fruits such as oranges, bananas, and apples, while 57 (17.8%) consumed them often and 55 (17.2%) never consumed them. Furthermore, the majority of respondents, 256 (80.0%), never consumed sweet snacks before bedtime, whereas 64 (20.0%) did so rarely, and none reported consuming such snacks often. Finally, 208 (65.0%) of the respondents never consumed dairy products such as milk, cheese, and yoghurt, while 56 (17.5%) consumed them often and an equal proportion, 56 (17.5%), consumed them rarely.

SECTION F

Table 3.6: Access to Dental Health Services and Fluoride Use

Statements	Frequency (320)	Percent (%)
Have you ever visited a dental clinic or seen a dentist?		
Yes	22	6.9
No	298	93.1
How often do you visit a dental clinic?		
Regularly (at least once every year)	0	0.0
Occasionally (only when there is a problem)	13	4.1
Rarely (once in several years)	0	0.0
Never	307	95.9
Who usually provides treatment when you have a tooth problem?		
Dentist at a clinic	209	65.3
Pharmacist or chemist	40	12.5
Traditional healer	0	0.0
Parent or guardian	0	0.0
No treatment is given	71	22.2
Do you use fluoride toothpaste when brushing your teeth?		
Yes	298	93.1
No	22	6.9
Have you ever received oral health education at school?		
Yes	218	68.1
No	102	31.9

Table 3.6 presents respondents' access to dental health services and fluoride use. The findings revealed that only 22 (6.9%) of the respondents had ever visited a dental clinic or seen a dentist, while the majority, 298 (93.1%), had never done so. Similarly, 307 (95.9%) reported that they never visited a dental clinic, whereas only 13 (4.1%) visited occasionally when they experienced a dental problem. The majority of respondents, 209 (65.3%), reported that they usually received treatment from a dentist at a clinic, while 40 (12.5%) sought treatment from a pharmacist or chemist. In contrast, 71 (22.2%) indicated that no treatment was given when they experienced a tooth problem, and none reported seeking care from a traditional healer or a parent/guardian. Furthermore, the majority of respondents, 298 (93.1%), reported using fluoride toothpaste when brushing their teeth, while only 22 (6.9%) did not use fluoride toothpaste. Regarding oral health education, 218 (68.1%) of the respondents had received oral health education at school, whereas 102 (31.9%) had not.

Table 3.7: Chi-square Test of Association between Sociodemographic Variables and Dental Caries Prevalence

Variable	χ^2	Df	p-value	Significance
Age group	9.210	4	0.056	Not significant
Gender	0.088	1	0.767	Not significant
Class (Educational level)	22.870	5	<0.001	Significant
Tribe	1.120	2	0.570	Not significant
Family size	9.670	4	0.046	Significant
Mother's occupation	1.880	3	0.598	Not significant
Parental help with brushing	20.860	1	<0.001	Significant

The Chi-square analysis tested associations between sociodemographic variables and the prevalence of dental caries among children using the presence of broken or rotten teeth as a proxy. The results indicate that class level ($\chi^2 = 22.870$, $p < 0.001$), family size ($\chi^2 = 9.670$, $p = 0.046$) and parental assistance with brushing ($\chi^2 = 20.860$, $p < 0.001$) were significantly associated with dental caries experience. Children in higher primary classes were more likely to report dental caries which may reflect increased self-reporting ability or cumulative exposure to cariogenic habits. Those from larger households had higher prevalence, possibly due to limited parental supervision, shared hygiene tools or constrained resources. Notably, children who did not receive help from parents while brushing were significantly more likely to have caries. Conversely, age group ($p = 0.056$) showed a borderline association, suggesting a possible trend but lacking statistical significance. Gender, tribe and mother's occupation were not significantly associated with caries prevalence.

Table 3.8: Chi-square Test Showing the Association between Dietary Practices and the Prevalence of Dental Caries (N = 320)

Variable	χ^2	Df	p-value	Significance
Sugary snacks consumption	18.462	2	<0.001	Significant
Sugary soft drinks consumption	10.817	2	0.004	Significant
Fruit consumption	5.291	2	0.071	Not significant
Sweet snacks before bedtime	9.586	1	0.002	Significant
Dairy products consumption	3.418	2	0.181	Not significant
Overall dietary practice	21.734	1	<0.001	Significant
Sugary snacks consumption	18.462	2	<0.001	Significant

The results presented in Table 3.8 indicate that dietary patterns were significantly associated with the prevalence of dental caries among primary school children in Ilorin West Local Government Area, Kwara State. Specifically, frequent consumption of sugary snacks ($\chi^2 = 18.462$, $p < 0.001$), sugary soft drinks ($\chi^2 = 10.817$, $p = 0.004$), and sweet snacks before bedtime ($\chi^2 = 9.586$, $p = 0.002$) showed statistically significant associations with dental caries. However, fruit consumption ($\chi^2 = 5.291$, $p = 0.071$) and dairy product consumption ($\chi^2 = 3.418$, $p = 0.181$) were not significantly associated with dental caries, as their p-values exceeded the 0.05 level of significance. The composite dietary pattern score was significantly associated with the prevalence of dental caries ($\chi^2 = 21.734$, $p < 0.001$). Therefore, the null hypothesis (H_0) was rejected, indicating that dietary patterns significantly influence the prevalence of dental caries among the respondents.

Table 3.9: Logistic Regression Analysis of Sociodemographic Factors Associated with Dental Caries among Respondents (N = 320)

Variable	Odds Ratio (OR) [95% CI]	P > z
Age (Years)		
6 (Reference)	Reference	-
8	0.846 (0.392–1.826)	0.673
10	1.284 (0.628–2.626)	0.493
11	1.694 (0.726–3.956)	0.221
12	2.218 (1.082–4.547)	0.030*
Sex		
Female (Reference)	Reference	-
Male	1.186 (0.612–2.298)	0.612
Class		
Primary 1 (Reference)	Reference	-
Primary 2	0.892 (0.401–1.983)	0.781
Primary 3	0.587 (0.203–1.696)	0.329
Primary 4	1.168 (0.481–2.835)	0.731
Primary 5	0.809 (0.339–1.932)	0.632
Primary 6	1.402 (0.592–3.319)	0.443
Tribe		
Yoruba (Reference)	Reference	-
Hausa	1.735 (0.704–4.276)	0.231
Others	2.364 (0.781–7.154)	0.128
Religion		

Islam (Reference)	Reference	-
Christianity	0.741 (0.389–1.410)	0.360
Family Size		
≤5 (Reference)	Reference	-
6	1.394 (0.639–3.044)	0.404
8	2.162 (1.149–4.069)	0.017*
10	2.508 (1.109–5.673)	0.027*
Mother's Occupation		
Trader (Reference)	Reference	-
Farmer	1.097 (0.524–2.299)	0.806
Civil Servant	0.914 (0.381–2.192)	0.841
Self-employed	1.462 (0.699–3.058)	0.314
Father's Occupation		
Trader (Reference)	Reference	-
Farmer	1.244 (0.571–2.711)	0.584
Civil Servant	1.726 (0.866–3.441)	0.119
Self-employed	0.958 (0.429–2.140)	0.917
Parental Help with Brushing		
Yes (Reference)	Reference	-
No	2.964 (1.274–6.895)	0.012*

* Significant at $p < 0.05$

Table 3.9 presents the logistic regression analysis of sociodemographic factors associated with dental caries among the 320 respondents. The results showed that age, family size, and parental assistance with tooth brushing were significant predictors of dental caries. Children aged 12 years were significantly more likely to have dental caries than those aged 6 years (OR = 2.218; 95% CI: 1.082–4.547; $p = 0.030$), indicating they had about twice the odds of developing dental caries. However, no significant associations were found for children aged 8, 10, or 11 years. Sex, class, tribe, religion, and parents' occupations were not significantly associated with dental caries ($p > 0.05$), although males and children from Hausa or other tribes showed slightly higher odds.

Children from families with eight members (OR = 2.162; $p = 0.017$) and ten members (OR = 2.508; $p = 0.027$) were significantly more likely to experience dental caries than those from families with five or fewer members. Additionally, children who did not receive parental help with tooth brushing had almost three times higher odds of developing dental caries compared with those who received assistance (OR = 2.964; 95% CI: 1.274–6.895; $p = 0.012$). The findings indicate that being 12 years old, living in a larger family, and lack of parental assistance with tooth brushing were significant factors associated with dental caries among the respondents.

4.0 DISCUSSION

The increasing burden of dental caries among children remains a major public health concern worldwide, particularly in low- and middle-income countries (LMICs), where access to preventive oral healthcare is often limited. According to the World Health Organization (2023), oral diseases affect approximately 3.7 billion people globally, with dental caries being one of the most common chronic conditions among children. Frequent consumption of free sugars, inadequate oral hygiene, and poor access to dental services continue to contribute to the high burden of the disease. Despite ongoing oral health promotion efforts, dental caries remains inadequately addressed in many Nigerian communities due to limited access to preventive dental care, poor oral health literacy, and insufficient integration of oral health education into school health programmes.

The socio-demographic profile of respondents in this study showed that the majority were female (81.3%), predominantly Yoruba (87.8%), Muslims (72.2%), and mostly aged 10–12 years, with the largest proportion being 12 years old (30.6%). Many respondents also came from relatively large households, and most mothers were traders while fathers were civil servants. Notably, 84.0% of the respondents reported that their parents or guardians did not assist them with tooth brushing, indicating poor parental involvement in children's oral hygiene practices. This finding is particularly important because both the chi-square and logistic regression analyses identified parental assistance with tooth brushing as a significant factor associated with dental caries. Similarly, children from larger households were significantly more likely to experience dental caries than those from smaller households. These findings suggest that parental supervision and family structure play important roles in

influencing children's oral health behaviours and dental caries experience.

The findings of this study indicate that the self-reported indicators of dental caries among the respondents were generally lower than those reported in previous studies conducted in Nigeria and other low- and middle-income countries (LMICs). The World Health Organization (2022) identifies untreated dental caries in permanent teeth as the most prevalent health condition globally, affecting approximately 2.5 billion people, while more than 530 million children are affected by caries in primary teeth. Similarly, studies in Nigeria have reported dental caries prevalence among children ranging from 12% to 45%, whereas estimates for sub-Saharan Africa range from 15% to 60% (Kimmie-Dhansay & Bhayat, 2022; Teshome *et al.*, 2021). These reports highlight the considerable burden of dental caries among children, particularly in settings with limited access to preventive oral healthcare.

In the present study, only 12.5% of the respondents reported having experienced toothache, 5.6% reported having a hole in their tooth, and 6.9% had ever visited a dentist because of a dental problem. Although 37.2% reported having had a broken or rotten tooth, the overall self-reported indicators of dental caries appeared lower than expected from previous studies. This difference may be attributed to the use of self-reported measures rather than clinical oral examination, which may underestimate the true burden of dental caries because children may not recognize early lesions or may fail to recall previous symptoms accurately. The very low utilization of dental services observed in this study further supports this explanation. More than 93% of the respondents had never visited a dentist, suggesting that many oral health problems may remain undiagnosed or untreated. This finding is consistent with previous reports that preventive dental care utilization remains poor in many Nigerian communities

due to limited access to oral health services, financial barriers, and low oral health awareness.

Furthermore, the statistical analyses identified several factors associated with dental caries among the respondents. The chi-square analysis showed that class level, family size, and parental assistance with tooth brushing were significantly associated with dental caries. However, after adjusting for potential confounding variables in the logistic regression model, only age, family size, and parental assistance with tooth brushing remained significant predictors. Specifically, children aged 12 years had significantly higher odds of experiencing dental caries than those aged 6 years, while children from households with eight or ten members were more likely to have dental caries than those from smaller households. In addition, children whose parents or guardians did not assist them with tooth brushing had nearly three times higher odds of developing dental caries than those who received parental assistance. These findings highlight the importance of parental involvement and family circumstances in influencing children's oral health outcomes. Therefore, interventions aimed at improving parental supervision of tooth brushing, promoting oral health education, and increasing access to preventive dental care services are essential for reducing the burden of dental caries among primary school children.

The findings of this study provide valuable insights into the level of awareness of dental caries among primary school children. The results showed that 80.3% of the respondents had heard of dental caries, while 87.9% demonstrated a high overall level of awareness. This suggests that awareness of dental caries is relatively high among the respondents and is consistent with efforts to promote oral health education among school-aged children. Previous studies have similarly reported that dental caries is one of the most common yet

preventable oral diseases, with its occurrence influenced by behavioural, environmental, and socioeconomic factors (Pitts *et al.*, 2021; Warreth, 2023). Despite the high level of awareness, important knowledge gaps were identified. Although 37.8% of the respondents correctly identified excessive consumption of sweets and 36.6% identified poor tooth brushing as causes of dental caries, 25.6% did not know the cause, and none identified bacteria in the mouth as an etiological factor. This finding suggests that respondents possessed basic knowledge of dental caries but lacked a comprehensive understanding of its underlying causes. Similar observations have been reported by Rathee and Sapra (2023), who emphasized that dental caries results from the interaction of plaque bacteria, fermentable carbohydrates, susceptible tooth surfaces, and time.

The study further revealed that friends and family members (88.7%) were the major sources of information on dental caries, followed by school teachers (28.0%), while none of the respondents reported receiving information from health workers, radio or television, or digital media. This indicates a limited role of healthcare professionals and mass media in oral health promotion within the study population. Previous studies have emphasized the importance of school-based oral health education programmes and the active involvement of healthcare professionals in improving children's knowledge and preventive oral health practices (Odunyemi *et al.*, 2023; Shomuyiwa, 2023). The findings therefore suggest the need to strengthen oral health education through schools and healthcare providers to improve children's understanding of dental caries and encourage appropriate preventive behaviours.

The absence of oral health information from healthcare professionals, the mass media, and digital platforms suggests that oral health education has not been adequately integrated into health communication strategies or school health programmes within the study area. Although 70.0% of the respondents believed that teeth should be brushed once daily and 30.0% believed they should be brushed twice daily, the oral hygiene practice findings showed that only 3.1% brushed their teeth twice daily every day, while 61.0% never brushed twice daily. This discrepancy indicates that awareness of recommended oral hygiene practices does not necessarily translate into appropriate behaviour. Furthermore, although 88.8% believed that tooth brushing helps prevent dental caries, only 16.0% reported receiving parental assistance with tooth brushing. This finding is particularly important because the logistic regression analysis demonstrated that children who did not receive parental assistance with brushing had significantly higher odds of developing dental caries than those who received assistance. The literature similarly recognizes parental involvement as an important determinant of children's oral health behaviours, as regular supervision helps establish proper brushing techniques and consistent oral hygiene practices (Koberova *et al.*, 2021). Overall, the findings suggest that although awareness of dental caries was generally high, important gaps remain in translating this knowledge into appropriate oral hygiene practices. Strengthening school-based oral health education and promoting greater parental involvement may therefore improve oral hygiene behaviours and reduce the risk of dental caries among primary school children.

The findings of this study provide important insights into the oral hygiene practices of the respondents, particularly regarding tooth brushing, use of toothpaste, dental visits, and other

oral hygiene behaviours. Comparison with existing literature reveals substantial gaps between recommended oral hygiene practices and those reported by the respondents. Current oral health guidelines recommend brushing the teeth at least twice daily with fluoride toothpaste to prevent dental plaque accumulation and dental caries (Kimmie-Dhansay & Bhayat, 2022). Although 99.4% of the respondents reported using toothpaste every day, the low frequency of tooth brushing may reduce the protective benefits of fluoride toothpaste against dental caries. This suggests that while access to toothpaste appears adequate, appropriate brushing habits have not been fully adopted. The study also found that 67.5% of the respondents used chewing sticks or other traditional cleaning materials daily. Although chewing sticks have been reported to possess some antimicrobial properties, they should not replace regular tooth brushing with fluoride toothpaste, which remains the recommended method for preventing dental caries (WHO, 2023).

Preventive dental care was also poorly utilized. Almost all respondents (98.7%) reported never attending routine dental check-ups, indicating very low use of preventive oral health services. This finding is consistent with previous studies in Nigeria, which attribute poor utilization of dental services to limited access, financial constraints, and inadequate awareness of preventive dental care (Odunyemi *et al.*, 2023). Furthermore, 97.5% of respondents reported never sharing their toothbrush, representing a positive oral hygiene practice among the study population. The findings further showed that inadequate oral hygiene practices may be influenced by limited parental support. The logistic regression analysis demonstrated that children who did not receive parental assistance with tooth brushing had significantly higher odds of experiencing dental caries than those who received

assistance. This supports previous evidence that parental supervision plays a critical role in establishing proper tooth-brushing habits during childhood (Koberova *et al.*, 2021). Therefore, improving parental involvement, strengthening school-based oral health education, and promoting regular preventive dental visits are essential strategies for improving oral hygiene practices and reducing the occurrence of dental caries among primary school children.

The findings of this study provide important insights into the dietary behaviours of primary school children and their relationship with dental caries. Existing evidence consistently shows that frequent consumption of fermentable carbohydrates, particularly sugary foods and beverages, is a major risk factor for the development of dental caries because oral bacteria metabolize these sugars to produce acids that demineralize tooth enamel (Zabokova, 2021; Hassan & Othman, 2024). Several studies have also demonstrated a positive association between frequent sugar intake and increased dental caries among children (Jangda *et al.*, 2024). The present study supports these findings as substantial proportion of respondents (65.6%) reported frequently consuming sugary snacks, while 19.7% often consumed sugary soft drinks. Furthermore, the chi-square analysis demonstrated that frequent consumption of sugary snacks, sugary soft drinks and sweet snacks before bedtime were significantly associated with dental caries. While previous studies have reported that fruits and dairy products may contribute to improved oral health through their nutrient content and potential remineralizing effects (Vittiello *et al.*, 2024), the present study did not demonstrate a significant relationship between these dietary factors and dental caries among the respondents.

The findings of this study demonstrate that dietary behaviours are important determinants of dental caries among primary school children. Frequent consumption of sugary snacks, sugary soft drinks, and sweet snacks before bedtime, as well as the overall dietary pattern, were significantly associated with dental caries, whereas fruit and dairy product consumption showed no significant association. These findings reinforce existing evidence that excessive sugar intake is a major contributor to dental caries and highlight the need for comprehensive interventions aimed at promoting healthy dietary habits among school-aged children. School-based oral health education, parental guidance on healthy feeding practices, and policies that discourage excessive consumption of sugary foods and beverages should be strengthened to reduce the burden of dental caries and improve the oral health of children in the study area.

5.0 CONCLUSION

This study examined the oral health status of primary school children aged 6–12 years attending selected public and private primary schools in Ilorin West Local Government Area of Kwara State, Nigeria. The findings provide valuable evidence on the level of awareness of dental caries, oral hygiene practices, dietary behaviours, access to dental health services, and the factors associated with dental caries among the respondents. The study demonstrates that although awareness of dental caries was relatively high, this awareness was not consistently reflected in appropriate oral health practices and preventive behaviours. The study revealed that the majority of respondents had heard about dental caries and demonstrated a high level of awareness. However, important knowledge gaps remained, as many respondents were unable to correctly identify all the causes of dental caries, particularly the role of bacteria in its development. In addition, oral health information was obtained mainly from informal sources such as friends, family members, and teachers, with little contribution from healthcare professionals or the mass media.

The findings further showed that oral hygiene practices among the respondents were generally unsatisfactory. Although almost all respondents reported using toothpaste, only a small proportion brushed their teeth twice daily as recommended, and routine dental visits were extremely uncommon. Most respondents had never visited a dentist, indicating poor utilization of preventive oral healthcare services. Parental involvement in children's oral hygiene was also limited, with the majority of children reporting that they brushed their teeth without parental assistance. This finding is particularly important because lack of parental assistance with tooth brushing was identified as an independent predictor of dental caries.

Dietary behaviours observed in the study also highlighted important oral health concerns. Frequent consumption of sugary snacks, sugary soft drinks, and sweet snacks before bedtime was significantly associated with dental caries, while the overall dietary pattern also showed a significant relationship with dental caries. In contrast, fruit and dairy product consumption did not show statistically significant associations. Furthermore, logistic regression analysis identified age (12 years), larger family size, and lack of parental assistance with tooth brushing as significant predictors of dental caries among the respondents.

The study demonstrates that dental caries among primary school children is influenced by a combination of behavioural and family-related factors rather than awareness alone. Improving children's oral health therefore requires comprehensive interventions that combine effective school-based oral health education, promotion of healthy dietary habits, increased parental involvement in supervising tooth brushing, and improved access to preventive dental care services. Implementing these strategies will contribute to reducing the burden of dental caries, encouraging positive oral health behaviours, and improving the long-term oral health and overall well-being of primary school children in Ilorin West Local Government Area and similar settings.

6.0 RECOMMENDATIONS

Based on the findings of this study, the following recommendations are made to relevant stakeholders:

To the Government

- Strengthen school oral health programmes by integrating regular dental screening, preventive services, and oral health education into existing school health programmes.
- Increase funding for public oral healthcare services to improve access to affordable and child-friendly dental care, particularly for school-aged children.
- Develop and enforce policies that regulate the sale and marketing of sugary snacks and sugar-sweetened beverages within and around primary schools.
- Support nationwide oral health awareness campaigns through mass media and community outreach to promote healthy oral hygiene practices and preventive dental care.

To Schools and Teachers

- Integrate oral health education into the school curriculum, emphasizing proper tooth-brushing techniques, the importance of fluoride toothpaste, and the prevention of dental caries.
- Organize regular oral health talks and dental screening programmes in collaboration with dental professionals and healthcare organizations.
- Promote healthy eating habits by discouraging the sale and consumption of sugary snacks and soft drinks within the school environment.

- Encourage supervised tooth-brushing activities, particularly for younger pupils, to reinforce appropriate oral hygiene practices.

To Parents and Guardians

- Supervise and assist children with tooth brushing, especially among younger children, to ensure proper brushing techniques and regular brushing twice daily.
- Limit children's consumption of sugary snacks, sugary drinks, and sweet foods before bedtime, while encouraging healthier food choices.
- Take children for regular preventive dental check-ups rather than seeking dental care only when problems arise.
- Serve as positive role models by practising good oral hygiene and reinforcing healthy oral health behaviours at home.

To Healthcare Organizations

- Expand community- and school-based oral health education programmes to improve children's knowledge of dental caries prevention and oral hygiene practices.
- Conduct regular school dental outreach services, including oral examinations, preventive treatments, and referrals for children requiring further care.
- Provide continuous training for healthcare workers and teachers on effective oral health promotion strategies for school-aged children.
- Collaborate with schools and community leaders to increase awareness of the importance of preventive dental care and regular dental visits.

To Non-Governmental Organizations (NGOs)

- Support oral health promotion programmes by sponsoring awareness campaigns targeting school children, parents, and teachers.
- Provide oral hygiene materials, such as toothbrushes and fluoride toothpaste, to children from disadvantaged households.
- Partner with schools and healthcare organizations to organize free dental screening and treatment outreaches for primary school children.
- Advocate for policies and interventions that improve children's access to preventive oral healthcare and promote healthy dietary practices within communities.

7.0 Declarations

Ethical approval, consent to participate, consent to publish: Ethical approval for the study was obtained from Ethical Review Committee of the Al-Hikmah University, Ilorin. The approval letter was then presented to all the necessary stakeholders before carrying out the study, while the purpose of the research was explained to each respondent and verbal informed consent obtained from them before inclusion into the study. Also, anonymity of the respondents was assured and ensured.

Consent for Publication: Not applicable.

Availability of data and materials: All data generated or analyzed during the study are included in the manuscript.

Questionnaire/Interview: Questionnaire was developed for this study, and the supplementary file has been uploaded.

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Author contributions:

Study concept and design: Abdullahi Usman Ndabata, and Oladimeji Lateefah Olabisi

Data collection: Balogun Abdulqudus Olaitan

Drafting and revision of paper: Abdullahi Usman Ndabata, Oladimeji Lateefah Olabisi, and Balogun Abdulqudus Olaitan

All authors have read, edited, and contributed to the content of this manuscript. This work has not been previously published and has not been considered for publication elsewhere.

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