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KNOWLEDGE, ATTITUDES, PRACTICES, AND ASSOCIATED FACTORS OF MALARIA PREVENTION AMONG MOTHERS OF CHILDREN UNDER FIVE YEARS IN ILORIN WEST LOCAL GOVERNMENT AREA, KWARA STATE, NIGERIA

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Abstract

Malaria remains one of the leading causes of morbidity and mortality among children under five years in sub-Saharan Africa, with Nigeria accounting for the highest global burden. Mothers play a critical role in malaria prevention through appropriate knowledge, attitudes, preventive practices, and prompt treatment-seeking behavior. A descriptive cross-sectional study was conducted among 372 mothers of children under five years in Ilorin West Local Government Area, Kwara State. Respondents were selected using a multistage sampling technique. Data were collected using a structured interviewer-administered questionnaire and analyzed using descriptive statistics, Pearson Product Moment Correlation, and one-way Analysis of Variance at a 5% level of significance. Respondents demonstrated a high level of knowledge regarding malaria (weighted mean = 3.46/4.00), positive attitudes towards malaria prevention and treatment (weighted mean = 3.41/4.00), and good malaria prevention practices. Most mothers correctly identified mosquito bites as the cause of malaria, recognized the importance of insecticide-treated nets and environmental sanitation, and reported adopting key preventive measures, including regular use of insecticide-treated nets, removal of stagnant water, bush clearing, use of mosquito repellents, participation in community sanitation activities, and adherence to health workers' advice on malaria prevention. Mothers exhibited satisfactory knowledge, positive attitudes, and appropriate malaria prevention practices. Strengthening maternal education and sustained community-based health education may further improve malaria prevention and reduce malaria-related morbidity among under-five children.

Keywords: Malaria prevention; Mothers; Under-five children

Introduction

Malaria 263 million malaria cases remains one of the most important public health challenges worldwide despite decades of coordinated control efforts. According to the World Health Organization (WHO, 2023)**,** an estimated and 597,000 deaths occurred globally in 2022, with approximately 95% of cases and deaths occurring in sub-Saharan Africa. Nigeria bears the greatest burden of malaria worldwide, accounting for about one-quarter of global malaria cases and nearly one-third of malaria-related deaths. Children under five years remain the most vulnerable population because of their immature immune systems, making malaria a leading cause of childhood morbidity, hospitalization, severe anemia, and mortality in the country (WHO, 2023).

Beyond its direct health consequences, malaria imposes enormous socioeconomic burdens on households and health systems through increased healthcare expenditure, reduced productivity, school absenteeism, and loss of income. Repeated malaria episodes during early childhood have also been associated with malnutrition, impaired cognitive development, poor educational outcomes, and long-term health consequences (Dasgupta *et al*., 2022; Anjorin *et al*., 2023; Isiko *et al*., 2024). Consequently, malaria remains a major obstacle to achieving the Sustainable Development Goals related to child survival and universal health coverage.

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Although several evidence-based interventions have substantially reduced malaria transmission over the past two decades, including long-lasting insecticide-treated nets (LLINs), indoor residual spraying, environmental sanitation, rapid diagnostic testing, and artemisinin-based combination therapy, malaria transmission remains persistent in many Nigerian communities. The effectiveness of these interventions depends largely on the extent to which households consistently adopt recommended preventive behaviors. Mothers, as the primary caregivers of children under five years, play a central role in implementing these preventive measures, recognizing early symptoms, and making timely decisions regarding healthcare utilization (Ajayi & Emeto, 2023).

Previous studies have consistently demonstrated that maternal knowledge significantly influences malaria prevention practices. Mothers with adequate knowledge of malaria transmission, symptoms, and preventive strategies are more likely to ensure regular use of insecticide-treated nets, maintain environmental sanitation, and seek prompt medical attention when children develop fever (Amu *et al*., 2020; Adeleke *et al*., 2025). However, knowledge alone does not necessarily translate into appropriate preventive behaviors. Cultural beliefs, misconceptions regarding malaria causation, perceived discomfort associated with mosquito nets, financial constraints, poor housing conditions, and limited access to quality healthcare continue to undermine effective malaria prevention in many communities (Fatunla *et al*., 2022; Asifat *et al*., 2025).

Treatment-seeking behaviors is another critical determinant of malaria outcomes among under-five children. Delayed presentation at healthcare facilities, self-medication, reliance on traditional remedies, and inappropriate use of antimalarial medications contribute substantially to severe malaria and preventable childhood deaths (Taremwa *et al*., 2022). Likewise, maternal educational attainment, household socioeconomic status, environmental sanitation, and access to malaria information have been identified as important predictors of malaria prevention practices (Bayode & Siegmund, 2022; Isiko *et al*., 2024).

Despite numerous malaria control programmes implemented across Nigeria through the National Malaria Elimination Programme, empirical evidence on maternal knowledge, attitudes, practices, treatment-seeking behaviors, and associated factors remains limited in Ilorin West Local Government Area of Kwara State. Understanding these behavioural determinants is essential for designing context-specific interventions that strengthen household malaria prevention and improve child health outcomes.

Therefore, this study assessed the knowledge, attitudes, practices, treatment-seeking behaviour, and associated factors related to malaria prevention among mothers of children under five years in Ilorin West Local Government Area, Kwara State. The findings provide evidence that can inform targeted health education programmes, community-based malaria interventions, and policy decisions aimed at reducing the burden of malaria among under-five children.

Aim and Objectives

Aim: To assess knowledge, attitudes, practices and associated factors of malaria prevention among mothers of children under- five years in Ilorin West Local Government Area, Kwara State, Nigeria.

Specific Objectives; (1) To assess the level of knowledge regarding causes, transmission, symptoms, and prevention of malaria among mothers of children under five years in Ilorin West LGA. (2) To examine mothers' attitudes toward malaria prevention and treatment of children under five in Ilorin West LGA. (3) To determine the malaria prevention practices adopted by mothers of children under five in Ilorin West LGA. (4) To assess treatment-seeking behavior of mothers when their under-five children develop symptoms suggestive of malaria. (5) To identify socio-demographic and knowledge-related factors associated with good malaria prevention practices among mothers in Ilorin West LGA.

Materials and Methods

A community-based descriptive cross-sectional study was conducted among mothers of children under five years residing in Ilorin West Local Government Area (LGA), Kwara State, Nigeria. Ilorin West LGA is one of the major metropolitan LGAs in Kwara State and comprises both urban and peri-urban communities with several primary healthcare facilities providing maternal and child health services. The study population consisted of mothers with at least one child under five years who had resided in the study area for a minimum of six months.

The minimum sample size of 372 respondents was determined using Fisher's formula for single population proportion, incorporating a 10% allowance for non-response. A multistage sampling technique

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was employed. Initially, wards were randomly selected from the LGA, followed by the selection of communities and households using systematic sampling. Where more than one eligible respondent was available within a household, one mother was selected by simple random sampling.

Data were collected using a structured interviewer-administered questionnaire developed from previous validated studies and relevant malaria prevention guidelines. The questionnaire comprised sections on socio-demographic characteristics, knowledge of malaria transmission and prevention, attitudes towards malaria prevention, malaria prevention practices, treatment-seeking behavior, and factors influencing malaria prevention. Face and content validity were established through expert review in public health, while reliability was assessed through a pilot study conducted among mothers outside the study area, yielding an acceptable Cronbach's alpha coefficient.

Ethical approval was obtained from the appropriate Health Research Ethics Committee before commencement of the study. Permission was also obtained from community leaders and relevant health authorities. Written informed consent was obtained from all respondents after explaining the study objectives, confidentiality, voluntary participation, anonymity, and the right to withdraw from the study at any time without any consequences.

Completed questionnaires were checked daily for completeness and consistency before data entry. Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 27. Descriptive statistics, including frequencies, percentages, means, and weighted mean scores, were used to summarize the data. Pearson Product Moment Correlation was used to determine the relationship between maternal knowledge and malaria prevention practices, while one-way Analysis of Variance (ANOVA) assessed associations between selected socio-demographic variables and malaria prevention practices. Statistical significance was set at $p < 0.05$.

RESULT

Demographic Information of Respondents

Table 4.1: Demographic Information of the Respondents

Variables	Categories	Frequency	Percentage
Age	15-24 years	47	12.6
	25-34 years	68	18.3
	35-44 years	123	33.1
	45years and above	134	36.0
Marital Status	Single	51	13.7
	Married	260	69.9
	Divorced	38	10.2
	Widowed	23	6.2
Education Level	No formal education	42	11.3
	Primary	27	7.3
	Secondary	74	19.9
	Tertiary	229	61.6
Occupation	Unemployed	60	16.1
	Self-employed	79	21.2
	Farmer	12	3.2
	Trader	58	15.6
	Artisan	22	5.9
	Civil Servant	141	37.9
Malaria Information Source	Health workers	220	59.1
	Radio	17	6.5

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	Television	17	4.6
	Social Media/Internet	43	11.6
	Friends/relative	42	11.3
	Community meetings	6	1.6
	School/Educational Institution	9	2.4
	Religious Institutions	4	1.1
	Posters, leaflets, or billboards	7	1.9
Monthly Household Income	<₦30,000	125	33.6
	₦30,000-60,000	58	15.6
	₦61,000-100,000	79	21.2
	> ₦100,000	110	29.6

Table 1 presents the socio-demographic characteristics of the 372 respondents. Most respondents were aged 45 years and above (36.0%) and 35–44 years (33.1%), indicating that the majority were adults actively involved in childcare. Most were married (69.9%) and had attained tertiary education (61.6%). Civil servants constituted the largest occupational group (37.9%), while 33.6% earned less than ₦30,000 monthly. The major source of malaria-related information was health workers (59.1%), highlighting the important role of healthcare professionals in disseminating malaria prevention information.

Table 4.2: Level of Knowledge of Malaria Among Mothers of Children Under Five

Item	SA	A	D	SD	Mean	Std. D
Malaria is caused by the bite of infected mosquitoes.	248	110	11	0	3.63	.55
Malaria can be life-threatening in children under five.	233	132	6	1	3.60	.54
Fever is one of the major symptoms of malaria.	163	197	11	1	3.40	.57
Sleeping under insecticide-treated nets prevents malaria.	202	151	17	2	3.49	.60
Clearing stagnant water around homes reduces malaria risk.	234	117	19	2	3.57	.62
Early treatment of malaria prevents complications.	218	124	26	4	3.50	.67
Weighted Average					**3.46**	

Key; SD = Strongly Disagree, D = Disagree, A = Agree, SA = Strongly Agree

Decision Value: = 0.00-2.49 = Low, 2.50-4.00 =High

Table 2 shows that respondents demonstrated a high level of knowledge regarding malaria. The respondents agreed that malaria is caused by the bite of infected mosquitoes ($\bar{x}$ = 3.63), malaria can be life-threatening in children under five ($\bar{x}$ = 3.60), clearing stagnant water reduces malaria risk ($\bar{x}$ = 3.57), early treatment prevents complications ($\bar{x}$ = 3.50), sleeping under insecticide-treated nets prevents malaria ($\bar{x}$ = 3.49), and fever is a major symptom of malaria ($\bar{x}$ = 3.40). The overall weighted mean of 3.46 indicates that mothers had a high level of knowledge regarding the causes, symptoms, and prevention of malaria.

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Table 4.3: Attitudes of Mothers toward Malaria Prevention and Treatment

Item	SA	A	D	SD	Mean	Std. D
Malaria is a serious health problem for children under five.	272	94	6	0	3.71	.49
Preventing malaria is the responsibility of every mother.	189	167	15	1	3.46	.59
I feel confident in my ability to prevent malaria in my child.	186	175	10	1	3.47	.56
Seeking treatment early is important when a child has fever.	253	113	4	2	3.66	.54
It is necessary to complete malaria medication as prescribed.	249	118	5	0	3.66	.50
Health workers provide reliable advice about malaria prevention.	228	123	21	0	3.56	.60
Weighted Average					**3.41**	

Key; SD = Strongly Disagree, D = Disagree, A = Agree, SA = Strongly Agree

Decision Value: = 0.00-2.49 = Negative, 2.50-4.00 =Positive

Table 3 indicates that respondents had a positive attitude towards malaria prevention and treatment. They agreed that malaria is a serious health problem for children under five ($\bar{x}$ = 3.71), seeking treatment early is important when a child has fever ($\bar{x}$ = 3.66), completing prescribed malaria medication is necessary ($\bar{x}$ = 3.66), health workers provide reliable advice on malaria prevention ($\bar{x}$ = 3.56), they were confident in their ability to prevent malaria in their children ($\bar{x}$ = 3.47), and preventing malaria is the responsibility of every mother ($\bar{x}$ = 3.46). The overall weighted mean of 3.41 indicates that respondents had a positive attitude towards malaria prevention and treatment.

Table 4.4: Malaria Prevention Practices Adopted by Mother of Under-Five Children

Item	SA	A	D	SD	Mean	Std. D
My child sleeps under an insecticide-treated net every night.	226	98	26	22	3.42	.86
I ensure stagnant water is removed around my home.	213	124	29	6	3.46	.71
I clear bushes around my house to prevent mosquitoes.	190	181	1	0	3.50	.50
I use mosquito repellents or indoor sprays in my home.	185	158	27	2	3.41	.66
I participate in community sanitation exercises.	191	165	15	1	3.46	.59
I follow health workers' advice on malaria prevention.	181	170	17	4	3.42	.63

Key; *SD* = Strongly Disagree, **D =** Disagree, **A =** Agree, **SA =** Strongly Agree

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Decision Value = 2.50

Table 4 shows that respondents adopted good malaria prevention practices. They agreed that they cleared bushes around their homes to prevent mosquitoes ($\bar{x}$ = 3.50), removed stagnant water around their homes ($\bar{x}$ = 3.46), participated in community sanitation exercises ($\bar{x}$ = 3.46), ensured their children slept under insecticide-treated nets every night ($\bar{x}$ = 3.42), followed health workers' advice on malaria prevention ($\bar{x}$ = 3.42), and used mosquito repellents or indoor sprays in their homes ($\bar{x}$ = 3.41). The overall weighted mean indicates that mothers adopted good malaria prevention practices for protecting their children against malaria.

Discussion

This study assessed the knowledge, attitudes, and malaria prevention practices among mothers of children under five years in Ilorin West Local Government Area, Kwara State. The findings revealed that respondents had a high level of knowledge, positive attitudes, and good malaria prevention practices. These findings suggest that mothers in the study area are well informed about malaria and are generally adopting recommended preventive measures for protecting their children.

The study found that mothers possessed a high level of knowledge regarding the causes, symptoms, and prevention of malaria. Most respondents correctly identified mosquito bites as the cause of malaria and recognized the importance of insecticide-treated nets, environmental sanitation, and early treatment in preventing malaria and its complications. This finding is consistent with the studies of Adeleke *et al*. (2025) and Adum *et al*. (2023), who reported that caregivers demonstrated good knowledge of malaria following sustained public health education. Similarly, Amin *et al*. (2023) found that adequate knowledge among caregivers improved the acceptance and utilization of malaria prevention interventions. The high level of knowledge observed in this study may be attributed to continuous malaria awareness campaigns and the prominent role of health workers as the major source of malaria information among respondents.

The findings further revealed that respondents exhibited positive attitudes towards malaria prevention and treatment. Most mothers perceived malaria as a serious health problem among children under five, believed that preventing malaria was their responsibility, expressed confidence in their ability to prevent malaria, recognized the importance of early treatment and completing prescribed antimalarial medications, and trusted information provided by health workers. This finding agrees with Ajayi and Emeto (2023), who reported positive caregiver attitudes towards malaria prevention interventions, and Nwogu *et al*. (2021), who noted that positive perceptions regarding malaria severity encourage the adoption of preventive behaviours. The positive attitudes observed in this study may reflect the effectiveness of health education and community-based malaria awareness programmes within the study area.

The study also showed that mothers adopted good malaria prevention practices. Respondents reported consistent use of insecticide-treated nets, removal of stagnant water, clearing of bushes around their homes, use of mosquito repellents or indoor sprays, participation in community sanitation activities, and adherence to health workers' advice on malaria prevention. These findings are consistent with those of Asifat *et al*. (2025) and Saka and Bilewu (2025), who reported that caregivers were more likely to adopt recommended malaria prevention measures when supported by effective health education and access to preventive interventions. Similarly, Sarfo *et al*. (2023) emphasized that environmental management and personal protective measures remain essential strategies for reducing malaria transmission. However, the findings differ from Babalola *et al*. (2020), who reported lower utilization of malaria preventive measures among caregivers in rural communities due to limited access to preventive resources and health information. The relatively good prevention practices observed in the present study may be explained by the high level of knowledge and positive attitudes demonstrated by respondents.

Overall, the findings indicate that mothers of children under five years in Ilorin West Local Government Area possess adequate knowledge, positive attitudes, and good malaria prevention practices. Sustaining community-based health education programmes and strengthening access to malaria prevention interventions will further enhance these behaviours and contribute to reducing the burden of malaria among children under five years.

Conclusion

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This study demonstrated that mothers of children under five years in Ilorin West Local Government Area possessed good knowledge of malaria transmission and prevention, maintained positive attitudes towards malaria prevention, practiced recommended malaria preventive measures, and generally exhibited appropriate treatment-seeking behaviour. Maternal knowledge was positively associated with malaria prevention practices, while educational level significantly influenced preventive behaviours. These findings highlight the importance of sustained health education and maternal empowerment in improving household malaria prevention. Continued investment in community-based malaria control programmes and behaviour change interventions will further strengthen malaria prevention efforts and contribute to reducing malaria-related morbidity among under-five children.

Recommendations

Community-based health education programmes should be strengthened to sustain and improve mothers' knowledge and positive attitudes towards malaria prevention.

Government and health agencies should ensure continuous availability and equitable distribution of long-lasting insecticide-treated mosquito nets and other malaria prevention commodities.

Primary healthcare facilities should intensify behavioural change communication on prompt diagnosis, appropriate treatment-seeking behaviour, and consistent use of recommended malaria prevention measures.

Maternal education and community outreach programmes should be expanded to improve malaria prevention practices, particularly among mothers with lower educational attainment.

Further studies using analytical or longitudinal designs should be conducted to evaluate the long-term effectiveness of malaria prevention interventions and behavioural change programmes in similar settings.

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Conflict of Interest: The authors declare no conflict of interest.

Author Contributions: The author conceived and designed the study, collected and analyzed the data, interpreted the findings, and prepared the manuscript.

Ethical Approval: Ethical approval was obtained from the appropriate Health Research Ethics Committee before commencement of the study. Written informed consent was obtained from all participants prior to data collection.

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