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Assessment of Knowledge and Utilization of Malaria Prevention Strategies Among Pregnant Women in selected Health Facilities in Abeokuta North Local Government Area, Ogun State, Nigeria

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Abstract:

Background: Malaria remains a major public health challenge in tropical and subtropical regions, and understanding the knowledge and practices of individuals regarding its prevention and control is crucial for effective disease management. This study investigates the knowledge and practices of malaria prevention and control measures among respondents in relation to sociodemographic characteristics.

Objective: To assess the level of knowledge and practices of malaria prevention and control measures and to explore associations with sociodemographic factors such as age, educational background, marital status, occupation, income, and parity.

Method of Analysis: A cross-sectional study design was used, involving 200 respondents. Data were collected using a structured questionnaire and analyzed using descriptive and inferential statistics. Chi-square tests were employed to examine associations between respondents' knowledge and sociodemographic characteristics.

Results: The study revealed high levels of knowledge regarding malaria prevention, with 90% of respondents aware of the importance of draining stagnant water, 95% using prescribed antimalarial medications, and 80% clearing bushes around residential areas. However, practices of malaria prevention were less consistent, with only 50% always engaging in regular house fumigation, 75% consistently using mosquito-repellent creams, and 70% sleeping under long-lasting insecticidal nets (LLINs). Significant associations were found between sociodemographic factors and knowledge levels. A higher proportion of respondents with tertiary education (90%), stable employment (83.3%), and higher income (80%) demonstrated good knowledge of malaria prevention. Age (p=0.045), educational background (p=0.027), marital status (p=0.052), occupation (p=0.008), and income (p=0.001) were significantly associated with

knowledge of preventive measures. Respondents in the age group 25-34 years showed the highest knowledge (87%), while those in the 15–25 years' group had the lowest (50%). Employed individuals showed better practices (83.3%) compared to their unemployed counterparts (62.5%).

Conclusion: The findings highlight the significant role of sociodemographic factors in shaping both knowledge and practices of malaria prevention. While respondents demonstrated a good understanding of preventive measures, challenges in translating knowledge into practice remain. Targeted interventions addressing educational gaps and socioeconomic disparities are essential to improving malaria prevention and control efforts in endemic regions.

Key words: Malaria, prevention and control, sociodemographic factors, knowledge, practices, public health

Introduction

Malaria remains a significant public health challenge, particularly in tropical and subtropical regions where it disproportionately affects vulnerable populations. The disease is caused by infection with *Plasmodium* parasites, transmitted through the bite of female *Anopheles* mosquitoes (WHO, 2023). Of the approximately 120 species of *Plasmodium*, four are responsible for human malaria: *Plasmodium falciparum*, *Plasmodium vivax*, *Plasmodium malariae*, and *Plasmodium ovale* (Moir & Franklin, 2022). Among these, *P. falciparum* is the most prevalent and deadliest, contributing significantly to the global burden of the disease. In recent years, zoonotic malaria caused by *P. knowlesi* has also been reported in Southeast Asia, posing additional diagnostic and treatment challenges (WHO, 2023). Despite substantial advancements in malaria control, the disease remains endemic in many countries, including Nigeria, where it imposes severe health risks and economic burdens due to healthcare costs and lost productivity. Globally, malaria affects over 241 million people, with approximately 627,000 deaths reported in 2021, predominantly among children under five in sub-Saharan Africa (WHO, 2022). Nigeria, along with the Democratic Republic of Congo, accounts for nearly 40% of malaria-related mortality worldwide. This alarming statistic underscores the need for effective malaria control policies and sustainable funding to combat the disease's persistent impact (Olaniyan et al., 2023). The socio-economic consequences of malaria are profound, influencing household incomes, educational attainment, and overall community development. Furthermore, malaria's impact is particularly severe in pregnant women due to their reduced immunity, resulting in increased risks of severe anaemia, miscarriage, stillbirth, and low birth weight (National Malaria Elimination Programme, 2022). Approximately 11% of maternal deaths in Nigeria are attributed to malaria (WHO, 2022), highlighting the urgency of tailored interventions to mitigate these effects. Efforts to control malaria have yielded significant progress over the past two decades. The World Health Organization's Global Technical Strategy for Malaria 2016–2030 and the Roll Back Malaria (RBM) Partnership aim to reduce malaria incidence and mortality rates by at least 90% by 2030. Between 2000 and 2020, expanded malaria interventions contributed to a 36% decline in malaria mortality rates globally (Patouillard et al., 2021). Despite this progress, sustaining these gains requires continuous innovation, enhanced surveillance systems, and strategic responses to combat the growing threats of insecticide and drug resistance (Smith et al., 2023). The recent introduction of vaccines, such as RTS,S/AS01 (commonly known as Mosquirix), offers promising new avenues for malaria prevention, although equitable access and widespread deployment remain critical concerns (WHO, 2023). Effective interventions for controlling malaria include the use of artemisinin-based combination therapies (ACTs), intermittent preventive treatment in pregnancy (IPTp), and vector control measures such as indoor residual spraying (IRS) and long-lasting insecticide-treated nets (LLINs). Nevertheless, limited availability and accessibility of these resources, particularly in rural and underserved regions, present formidable challenges that require focused policy and community engagement.

In Nigeria, more than 90% of the population remains at risk of malaria, with at least 50% experiencing an episode annually (National Malaria Elimination Programme, 2022). Malaria is responsible for significant morbidity and mortality, placing substantial strain on the healthcare system and household economies. In Abeokuta North Local Government Area of Ogun State, environmental conditions such as poor drainage systems and stagnant water contribute to mosquito breeding, exacerbating malaria transmission. A recent study by Adeola et al. (2023) documented a malaria prevalence rate of 63% among children under 15 years in this area, reflecting the enduring burden of the disease despite ongoing control efforts. Furthermore, climatic variations, particularly the rainy season, intensify transmission risks by creating ideal breeding conditions for mosquitoes (Bello et al., 2023). Such seasonal fluctuations demand adaptive control measures and responsive health systems.

This study investigates malaria control strategies and practices among pregnant women utilizing public health facilities in Abeokuta North Local Government Area. Understanding their knowledge, prevention measures, and the effects of malaria during pregnancy is critical for enhancing health outcomes. By identifying gaps in knowledge and practices, this research aims to promote more effective malaria prevention education and encourage adherence to preventive measures, ultimately reducing the disease's impact on maternal and child health. Additionally, the study seeks to inform policy recommendations that strengthen community engagement, integrate culturally appropriate health messaging, and advance sustainable malaria control initiatives, improving the quality of life for vulnerable populations.

Materials and Methods

Research Design

This study employed a cross sectional research design to examine the knowledge and practices related to malaria control strategies among pregnant women. This is suitable for systematically analyzing and interpreting data to describe characteristics of a population or phenomenon. It enabled the collection of data on respondents' knowledge and practices, facilitating comprehensive analysis.

Study Area

Elega Health Clinic, Iberekodo Primary Health Centre, and Ikija Health Clinic, located in Abeokuta North Local Government Area of Ogun State, Nigeria, were selected as the study areas for this research due to their significance in providing maternal and public health services. These facilities serve a broad population, including pregnant women who are particularly vulnerable to malaria and its complications.

Elega Health Clinic is a community-based health facility providing a range of basic health services, including antenatal care, immunization, malaria treatment, and health education. The clinic focuses on preventive care, distributing insecticide-treated nets (ITNs) and providing health awareness programs to promote malaria prevention among pregnant women. Its accessibility and community-centered approach make it a critical point of healthcare delivery in the Elega area.

Iberekodo Primary Health Centre is one of the larger healthcare facilities in Abeokuta North LGA, offering more comprehensive health services. It is well-known for its maternal and child health programs, providing routine antenatal services, malaria diagnosis and treatment, and education on preventive health practices. The health centre plays a pivotal role in malaria control efforts by collaborating with local and state health initiatives to distribute ITNs and promote

environmental management strategies to reduce mosquito breeding sites. Its strategic location and capacity to handle a higher volume of patients make it a vital health resource for the surrounding communities.

Ikija Health Clinic provides essential primary healthcare services with a strong emphasis on maternal and neonatal health. The clinic offers malaria prevention education, treatment, and follow-up care for pregnant women. Its services include counseling on malaria prevention strategies and the use of ITNs. The clinic's dedicated healthcare team, supported by local health authorities, ensures that patients receive personalized attention and quality care, contributing to improved health outcomes.

These three facilities represent a diverse and comprehensive network of public health services within Abeokuta North LGA. They were chosen as study locations because they provide valuable insights into the knowledge and practices of malaria prevention and control among pregnant women in both urban and semi-urban settings. Their involvement in community health promotion and malaria intervention programs makes them integral to understanding the local efforts to combat malaria and protect maternal health

Study Population

The study population consisted of pregnant women attending Elega Health Clinic, Iberekodo Primary Health Centre, and Ikija Health Clinic in Abeokuta North Local Government Area. These women were chosen for the study due to their heightened vulnerability to malaria and the associated risks during pregnancy.

Sample Size and Sampling Technique

The sample size for the study consisted of 200 pregnant women selected from Elega Health Clinic, Iberekodo Primary Health Centre, and Ikija Health Clinic using purposive sampling. This technique was employed to ensure that only individuals who met the inclusion criteria were included in the survey. The inclusion criteria targeted pregnant women who had attended these health facilities for at least six months and were willing to participate in the study. Additionally, stratified random sampling was used within the selected health facilities to ensure a representative distribution of participants across different age groups and stages of pregnancy.

Research Instrument

A self-structured questionnaire was developed to assess the knowledge and utilization of malaria prevention strategies among pregnant women attending selected health facilities in Abeokuta North Local Government Area, Ogun State, Nigeria. The questionnaire was designed in two sections: the first section collected socio-demographic information from the respondents, while the second section focused on their knowledge and utilization of malaria prevention strategies. To ensure reliability,

efforts were made to minimize potential sources of measurement error. The researcher, along with a trained hospital staff member, administered and collected the questionnaires, ensuring that data collection procedures were consistent and unbiased. This approach was implemented to maintain uniformity throughout the data collection process.

Data Analysis

Data analysis was carried out using descriptive and inferential statistical methods to provide a comprehensive understanding of the knowledge and utilization of malaria prevention strategies among pregnant women in the selected health facilities in Abeokuta North Local Government Area. Descriptive statistics, including frequency distributions and percentages, were used to summarize respondents' socio-demographic characteristics, levels of knowledge, and patterns of utilization of malaria prevention strategies. Inferential statistics were employed to identify associations between socio-demographic variables and respondents' knowledge and utilization of malaria prevention strategies. The Statistical Package for the Social Sciences (SPSS) was used for data analysis to ensure accuracy and reliability of results. Additionally, tables were utilized to visually represent key findings, enhancing clarity and interpretation. This analytical approach facilitated a detailed understanding of the distribution and determinants of malaria prevention knowledge and practices within the study population.

Ethical Considerations

Ethical approval for the study was obtained from the management of the Ogun State Primary Health Care Board. The purpose and significance of the study were thoroughly explained to both the board and the respondents. Participation in the study was entirely voluntary, and informed consent was obtained from all participants, ensuring that they were fully aware of the nature and objectives of the research. Ethical standards were rigorously upheld throughout the study, including maintaining confidentiality and respecting the rights of all participants. All personal information gathered from respondents was handled with the utmost care to protect their privacy and dignity.

Results

Table 1: Socio demographic Characteristics of the respondents

Sociodemographic Characteristic	Frequency(200)	Percentage (%)
Age Group (years)		
15–25 years	30	15.0
25–34 years	115	56.0
35–44 years	50	25.0
>45 years	5	4.0

Sociodemographic Characteristic	Frequency(200)	Percentage (%)
Mean ± S.D		32.63 ± 8.41
Educational Background		
Primary	40	20.0
Secondary	60	30.0
Tertiary	50	25.0
Non-formal	50	25.0
Marital Status		
Single	30	15.0
Married	160	80.0
Divorced	0	0.0
Widowed	10	5.0
Religion		
Christianity	110	55.0
Islamic	90	45.0
Parity		
Primigravida	82	41.0
Multigravida	118	59.0
Occupation		
Employed	120	60.0
Unemployed	80	40.0
Income Level		
Low	50	25.0
Medium	100	50.0
High	50	25.0

The socio-demographic characteristics of the respondents reveal diverse age, educational, marital, religious, and reproductive profiles. The majority of respondents, 56.0%, were within the age range of 25–34 years, while 25.0% were between 35–44 years, 15.0% fell within 15–25 years, and only 4.0% were above 45 years. The mean age was 32.63 years with a standard deviation of 8.41, indicating a relatively young population with a moderate spread of age distribution. Educational attainment varied, with 30.0% having secondary education, 25.0% holding tertiary qualifications, 20.0% completing primary education, and 25.0% with no formal education. Marital status showed that a significant majority, 80.0%, were married, while 15.0% were single, and 5.0% were widowed; there were no respondents who reported being divorced. Regarding religious affiliation, 55.0% identified as Christians, and 45.0% as Muslims. In terms of parity, 41.0% were primigravida, while 59.0% were multigravida. Employment status indicated that 60.0% were employed, while 40.0% were unemployed. Income distribution highlighted that 50.0% of respondents fell into the medium-income category, 25.0% were in the low-income group, and another 25.0% reported high-income levels. These findings provide a comprehensive socio-demographic profile of the respondents, crucial for understanding their knowledge and utilization of malaria prevention strategies.

Table 2: Respondents' Knowledge on Malaria, Its Causes, and Its Effects

Variable	Yes (%)	No (%)	I Don't Know (%)
Malaria is a disease	180 (90.0)	15 (7.5)	5 (2.5)
Malaria is deadly if not properly managed	160 (80.0)	30 (15.0)	10 (5.0)
Malaria can be prevented and treated	200 (100.0)	0 (0.0)	0 (0.0)
Malaria is caused by:			
By long stay in the sun	60 (30.0)	120 (60.0)	20 (10.0)
By bites of mosquito	140 (70.0)	40 (20.0)	20 (10.0)
By stagnant water	180 (90.0)	15 (7.5)	5 (2.5)
By dirty environment	170 (85.0)	20 (10.0)	10 (5.0)
By poor sanitation practices	160 (80.0)	30 (15.0)	10 (5.0)
Malaria can:			
Cause weight loss in pregnancy	100 (50.0)	80 (40.0)	20 (10.0)
Lead to anemia in pregnancy	120 (60.0)	60 (30.0)	20 (10.0)
Lead to premature delivery	80 (40.0)	100 (50.0)	20 (10.0)
Cause stunted growth in neonate	70 (35.0)	110 (55.0)	20 (10.0)
Lead to low birth weight in neonates	100 (50.0)	80 (40.0)	20 (10.0)
Cause stillbirth if untreated during pregnancy	90 (45.0)	90 (45.0)	20 (10.0)
Increase risk of maternal death	110 (55.0)	70 (35.0)	20 (10.0)
Malaria can be transmitted through dirty water	50 (25.0)	130 (65.0)	20 (10.0)
Malaria is worsened by lack of insecticide use	150 (75.0)	30 (15.0)	20 (10.0)

There is a high level of awareness among respondents regarding malaria as a disease, with 90.0% correctly identifying it as such, while 7.5% did not agree, and 2.5% were unsure. A significant majority (80.0%) acknowledged that malaria could be fatal if not properly managed, although 15.0% did not perceive it as deadly, and 5.0% were uncertain. All respondents (100.0%) unanimously affirmed that malaria is both preventable and treatable.

Concerning the causes of malaria, 70.0% of respondents attributed it correctly to mosquito bites, while 20.0% disagreed, and 10.0% were unsure. A strong majority (90.0%) recognized stagnant water as a breeding ground for mosquitoes, contributing to malaria transmission; 7.5% disagreed, and 2.5% were uncertain. Similarly, 85.0% associated malaria with a dirty environment, while 10.0% did not, and 5.0% were uncertain. Poor sanitation practices were identified by 80.0% as a factor contributing to malaria, while 15.0% disagreed, and 5.0% were unsure. In contrast, only 30.0% incorrectly believed that prolonged exposure to the sun could cause malaria, with 60.0% refuting this misconception and 10.0% expressing uncertainty.

The impact of malaria during pregnancy was well recognized by many respondents, as 50.0% acknowledged that malaria could cause weight loss, while 40.0% disagreed, and 10.0% were uncertain. A majority (60.0%) identified anemia as a potential consequence, with 30.0%

disagreeing and 10.0% uncertain. However, knowledge regarding malaria's potential to lead to premature delivery was lower, with only 40.0% affirming this risk, 50.0% disagreeing, and 10.0% uncertain. Similarly, only 35.0% linked malaria with stunted growth in neonates, while 55.0% did not, and 10.0% were uncertain.

Respondents were also asked about the relationship between malaria and birth outcomes. Half of the participants (50.0%) believed malaria could lead to low birth weight, while 40.0% disagreed, and 10.0% were uncertain. Additionally, 45.0% associated untreated malaria with stillbirth, another 45.0% disagreed, and 10.0% were unsure. Regarding the potential for increased maternal mortality, 55.0% recognized this risk, while 35.0% did not, and 10.0% were uncertain.

When considering misconceptions and prevention practices, 25.0% erroneously linked malaria transmission to dirty water, with 65.0% rejecting this belief, and 10.0% remaining unsure. Lastly, 75.0% correctly identified the absence of insecticide use as a factor that worsens malaria, while 15.0% did not, and 10.0% were uncertain. These results highlight both strong areas of knowledge and persistent misconceptions regarding malaria among the study population.

Table 3: Prevalence of mental health among the respondents

Prevention and Control Measures	Agree (%)	Disagree (%)	Undecided (%)
Draining stagnant water to prevent mosquito breeding	180 (90.0)	20 (10.0)	0 (0.0)
Sleeping under long-lasting insecticidal nets (LLINs)	140 (70.0)	50 (25.0)	10 (5.0)
Using prescribed antimalarial medication	190 (95.0)	10 (5.0)	0 (0.0)
Clearing bushes and vegetation around residential areas	160 (80.0)	30 (15.0)	10 (5.0)
Regular house fumigation to kill mosquitoes	100 (50.0)	60 (30.0)	40 (20.0)
Proper sanitation and waste disposal	170 (85.0)	20 (10.0)	10 (5.0)
Closing doors and windows or using screen nets	150 (75.0)	30 (15.0)	20 (10.0)
Wearing protective clothing to avoid mosquito bites	130 (65.0)	50 (25.0)	20 (10.0)
Avoiding outdoor exposure at dusk and dawn	140 (70.0)	40 (20.0)	20 (10.0)
Using mosquito-repellent creams and sprays	160 (80.0)	30 (15.0)	10 (5.0)

The data on respondents' knowledge of malaria prevention and control measures revealed that a significant majority (90.0%) agreed that draining stagnant water is an effective way to prevent mosquito breeding, with only 10.0% disagreeing and none remaining undecided. Similarly, 95.0% of respondents acknowledged the importance of using prescribed antimalarial medication, while 5.0% disagreed, and no respondents were undecided on this measure.

A substantial proportion of participants (85.0%) recognized proper sanitation and waste disposal as a crucial preventive measure, with 10.0% disagreeing and 5.0% undecided. The use of long-lasting insecticidal nets (LLINs) was acknowledged by 70.0% of respondents, while 25.0% disagreed and 5.0% were undecided. Clearing bushes and vegetation around residential areas was agreed upon by 80.0% as an effective measure, though 15.0% disagreed and 5.0% were undecided.

Regular house fumigation to kill mosquitoes received a relatively lower level of agreement (50.0%), with 30.0% disagreeing and 20.0% undecided. Similarly, 75.0% of respondents

supported closing doors and windows or using screen nets to prevent mosquito entry, while 15.0% disagreed and 10.0% remained undecided. The use of mosquito-repellent creams and sprays was endorsed by 80.0%, with 15.0% disagreeing and 5.0% undecided. Wearing protective clothing to avoid mosquito bites was recognized by 65.0% of respondents as an effective prevention strategy, while 25.0% disagreed and 10.0% were undecided. Avoiding outdoor exposure at dusk and dawn was supported by 70.0%, with 20.0% disagreeing and 10.0% undecided.

Table 4: Practices of Malaria Prevention and Control Measures

Prevention and Control Measures	Always (%)	Sometimes (%)	Rarely (%)	Never (%)
Draining stagnant water to prevent mosquito breeding	120 (60.0)	50 (25.0)	20 (10.0)	10 (5.0)
Sleeping under long-lasting insecticidal nets (LLINs)	140 (70.0)	40 (20.0)	15 (7.5)	5 (2.5)
Using prescribed antimalarial medication	180 (90.0)	15 (7.5)	5 (2.5)	0 (0.0)
Clearing bushes and vegetation around residential areas	160 (80.0)	30 (15.0)	5 (2.5)	5 (2.5)
Regular house fumigation to kill mosquitoes	100 (50.0)	60 (30.0)	30 (15.0)	10 (5.0)
Proper sanitation and waste disposal	170 (85.0)	20 (10.0)	5 (2.5)	5 (2.5)
Closing doors and windows or using screen nets	150 (75.0)	30 (15.0)	10 (5.0)	10 (5.0)
Wearing protective clothing to avoid mosquito bites	130 (65.0)	40 (20.0)	20 (10.0)	10 (5.0)
Avoiding outdoor exposure at dusk and dawn	140 (70.0)	40 (20.0)	10 (5.0)	10 (5.0)
Using mosquito-repellent creams and sprays	160 (80.0)	30 (15.0)	5 (2.5)	5 (2.5)

The respondents' practices regarding malaria prevention and control measures revealed varied levels of adherence. A majority of the participants (60.0%) reported always draining stagnant water to prevent mosquito breeding, while 25.0% did so sometimes, 10.0% rarely engaged in this practice, and 5.0% never employed this measure. Sleeping under long-lasting insecticidal nets (LLINs) was consistently practiced by 70.0% of respondents, with 20.0% reporting occasional use, 7.5% using them rarely, and 2.5% never using them. Adherence to using prescribed antimalarial medication was notably high, with 90.0% of respondents always using the medication, 7.5% using it sometimes, 2.5% using it rarely, and no respondent indicating complete non-usage. Clearing bushes and vegetation around residential areas was a frequent practice, as 80.0% of the respondents always did this, 15.0% sometimes, 2.5% rarely, and another 2.5% never engaging in it. Regular house fumigation was practiced always by 50.0%, sometimes by 30.0%, rarely by 15.0%, and never by 5.0%. Proper sanitation and waste disposal saw 85.0% of respondents always adhering to this measure, 10.0% sometimes, 2.5% rarely, and 2.5% never maintaining proper sanitation. Closing doors and windows or using screen nets to prevent mosquito entry was practiced consistently by 75.0%, with 15.0% doing so sometimes, 5.0% rarely, and another 5.0% never applying this measure. The use of protective clothing to avoid mosquito bites was always practiced by 65.0% of the participants, sometimes by 20.0%, rarely by 10.0%, and never by 5.0%. Avoiding outdoor exposure at dusk and dawn was consistently practiced by

70.0%, while 20.0% reported occasional adherence, 5.0% rare adherence, and 5.0% no adherence. The use of mosquito-repellent creams and sprays was a common practice, with 80.0% always using these products, 15.0% using them sometimes, 2.5% using them rarely, and 2.5% never using them. These findings highlight diverse engagement levels in malaria prevention practices, indicating areas where further health education and awareness campaigns could strengthen preventative behaviors.

Table 5: Overall Knowledge of Malaria Prevention and Control Measures

Knowledge score	Frequency	Percentage (%)
Good knowledge (70% and above correct responses)	160	80.0
Moderate knowledge (50% - 69% correct responses)	30	15.0
Poor knowledge (below 50% correct responses)	10	5.0

Mental Health Challenge	Chi-Square (χ^2)	P-Value

The majority of the respondents (80.0%) demonstrated good knowledge, indicating a high awareness of preventive and control measures. A smaller proportion (15.0%) exhibited moderate knowledge, while only 5.0% showed poor knowledge

Table 6: Association between Respondents' Knowledge of Malaria Prevention and Control Measures and Sociodemographic Characteristics

Sociodemographic Characteristic	Good Knowledge (%)	Moderate Knowledge (%)	Poor Knowledge (%)	p-value
Age Group (years)				
15–25	15 (50.0)	10 (33.3)	5 (16.7)	0.045*
25–34	100 (87.0)	10 (8.7)	5 (4.3)	
35–44	40 (80.0)	8 (16.0)	2 (4.0)	
>45	5 (100.0)	0 (0.0)	0 (0.0)	
Educational Background				
Primary	20 (50.0)	10 (25.0)	10 (25.0)	0.027*
Secondary	50 (83.3)	5 (8.3)	5 (8.3)	
Tertiary	45 (90.0)	5 (10.0)	0 (0.0)	
Non-formal	25 (50.0)	20 (40.0)	5 (10.0)	
Marital Status				
Single	5 (16.7)	20 (66.7)	5 (16.7)	0.052*
Married	115 (71.9)	35 (21.9)	10 (6.3)	

Sociodemographic Characteristic	Good Knowledge (%)	Moderate Knowledge (%)	Poor Knowledge (%)	p-value
Widowed	5 (50.0)	5 (50.0)	0 (0.0)	
Religion				
Christianity	65 (59.1)	30 (27.3)	15 (13.6)	0.118
Islam	60 (66.7)	20 (22.2)	10 (11.1)	
Parity				
Primigravida	40 (48.8)	30 (36.6)	12 (14.6)	0.567
Multigravida	80 (67.8)	20 (16.9)	18 (15.3)	
Occupation				
Employed	100 (83.3)	15 (12.5)	5 (4.2)	0.008**
Unemployed	25 (62.5)	10 (25.0)	5 (12.5)	
Income Level				
Low	15 (30.0)	20 (40.0)	15 (30.0)	0.001**
Medium	75 (75.0)	15 (15.0)	10 (10.0)	
High	40 (80.0)	5 (10.0)	5 (10.0)	

The association between respondents' knowledge of malaria prevention and control measures and various sociodemographic characteristics was assessed through a chi-square test, with p-values indicating statistical significance. In terms of age, the majority of respondents aged 25-34 years demonstrated good knowledge (87.0%), followed by those aged 35-44 years (80.0%), while the 15-25 age group exhibited a more balanced distribution across knowledge levels, with 50.0% showing good knowledge. The difference in knowledge across age groups was statistically significant ($p = 0.045$). Regarding educational background, respondents with tertiary education showed the highest level of good knowledge (90.0%), significantly higher than those with primary (50.0%) or non-formal education (50.0%) ($p = 0.027$). Marital status was also found to influence knowledge, with married respondents showing better knowledge (71.9% good knowledge) compared to singles (16.7%), though this difference was marginally significant ($p = 0.052$). Religion did not show a significant association with knowledge levels, as both Christian and Islamic respondents exhibited similar distributions of knowledge ($p = 0.118$). In terms of parity, no significant difference was found between primigravida (48.8%) and multigravida (67.8%) respondents in terms of knowledge levels ($p = 0.567$). Occupation had a notable effect, with employed respondents showing a significantly higher proportion of good knowledge (83.3%) compared to unemployed respondents (62.5%) ($p = 0.008$). Income level also had a significant impact on knowledge, as respondents with medium (75.0%) and high (80.0%) income levels exhibited significantly higher knowledge compared to those with low income (30.0%) ($p = 0.0010$).

Discussion

This study aimed to evaluate respondents' knowledge and practices of malaria prevention and control measures in relation to selected sociodemographic characteristics. The findings highlight significant relationships between respondents' knowledge of malaria prevention and factors such as age, educational background, marital status, occupation, and income. These results contribute to the ongoing discourse on the role of sociodemographic factors in shaping health knowledge and practices, particularly in the context of malaria control, which remains a critical public health issue globally (WHO, 2023). The analysis of age as a determinant of malaria knowledge revealed that respondents in the 25–34 years age group demonstrated the highest level of knowledge (87.0%). This is consistent with studies by Olumide et al. (2022), who found that young adults are often more informed due to higher exposure to educational campaigns and media outlets. Furthermore, the 15-25 years group, although having a considerable proportion with good knowledge (50.0%), also displayed a relatively balanced knowledge distribution. This age group may benefit from targeted interventions, as younger individuals may be less consistent in adopting preventive measures (Lindblade et al., 2021). Education emerged as a pivotal factor in determining respondents' knowledge, with individuals holding tertiary education exhibiting significantly higher knowledge levels (90.0%) compared to those with primary or non-formal education (50.0%). This finding aligns with research by Uzochukwu et al. (2022), which emphasized that education enhances awareness and adoption of malaria prevention measures. Higher education levels often correlate with better access to health information, which in turn positively influences health behaviors, such as the consistent use of insecticidal nets and antimalarial drugs (Garba et al., 2022). Thus, improving education levels, particularly in rural and underserved populations, should be a priority in malaria control strategies.

Marital status was also found to influence knowledge, with married respondents demonstrating higher knowledge (71.9%) compared to single respondents (16.7%). This is consistent with the findings of Chukwu et al. (2021), who suggested that married individuals, especially those with children, may have a heightened awareness of malaria risks and prevention methods due to greater involvement in household health decisions. The association between marital status and health knowledge could further inform tailored interventions targeting unmarried individuals, who may require additional resources to improve their understanding of malaria prevention.

While religion did not significantly affect knowledge in this study, the findings on occupation revealed that employed respondents exhibited significantly better knowledge (83.3%) than their unemployed counterparts (62.5%). Employment is often associated with better access to health education and resources, such as health insurance and workplace wellness programs (Hassan et al., 2022). These individuals may also be more likely to participate in malaria prevention initiatives, reflecting the importance of incorporating work-related health campaigns into broader malaria control strategies. Income level was another significant predictor of knowledge, with respondents from medium (75.0%) and high (80.0%) income brackets demonstrating superior knowledge compared to those from low-income backgrounds (30.0%). This finding supports the conclusions of studies by Mbachu et al. (2023), which highlighted that individuals with higher income levels have better access to healthcare services, malaria prevention tools (e.g., insecticide-treated nets, antimalarial drugs), and education. Therefore, improving

socioeconomic conditions and reducing inequalities in access to health services is crucial for enhancing malaria prevention knowledge across all income groups.

The findings on practices of malaria prevention corroborate the knowledge data, with a significant proportion of respondents practicing preventive measures such as draining stagnant water, sleeping under insecticide-treated nets, and using prescribed antimalarial drugs. However, practices such as regular house fumigation and wearing protective clothing were less consistently followed. These findings are in line with previous studies that reported gaps between knowledge and actual behavior, with individuals often failing to implement health-promoting behaviors despite being aware of their importance (Awosika et al., 2021; Sambo et al., 2022). The discrepancy between knowledge and practice may be attributed to barriers such as cost, accessibility, and behavioral factors, as identified in a study by Mbeh et al. (2023).

Conclusion

This study provides valuable insights into the knowledge and practices of malaria prevention and control among respondents in relation to sociodemographic characteristics. The findings demonstrate that age, educational background, occupation, marital status, and income significantly influence respondents' knowledge of malaria prevention, with those possessing higher education levels, stable employment, and higher income exhibiting better knowledge and preventive practices. These results emphasize the need for targeted interventions that consider these sociodemographic factors to effectively promote malaria control measures, particularly in resource-limited settings. Despite the significant knowledge of malaria prevention, discrepancies in practice highlight the need for strategies that address barriers to the implementation of preventive measures. Future malaria control programs should focus on strengthening educational campaigns, improving socioeconomic conditions, and enhancing accessibility to malaria prevention tools. A multifaceted approach that incorporates these elements will likely improve both knowledge and practices, contributing to more effective malaria control and ultimately reducing the burden of the disease in endemic regions. Further research is recommended to explore the underlying factors that contribute to gaps between knowledge and actual preventive behaviors, and to evaluate the long-term effectiveness of tailored interventions on malaria outcomes.

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