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Malaria Prevention and Control Practices among Pregnant Women Attending Antenatal Clinics at LAUTECH Teaching Hospital, Ogbomosho North Local Government, Oyo State, Nigeria

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Annotation: Introduction: Pregnant women are among the most vulnerable groups to infectious diseases due to weakened immunity during pregnancy. The risk of malaria infection during pregnancy poses serious health threats to both the mother and the unborn child, leading to complications such as anemia, low birth weight, and stillbirth. Despite various malaria control interventions in Nigeria, the level of knowledge and adoption of preventive measures among pregnant women remains a concern.

Objective: This study assessed malaria prevention and control practices among pregnant women attending antenatal clinics at Ladoke Akintola University of Technology (LAUTECH) Teaching Hospital, Ogbomoso North Local Government, Oyo State, Nigeria.

Method of Analysis: A descriptive research design was employed, with a sample size of 150 pregnant women selected using a convenience sampling technique. Data were collected using a structured questionnaire, which was reviewed for validity and reliability. Descriptive statistics, including frequency distributions and percentages, were used to analyze socio-demographic characteristics and malaria prevention practices. Inferential statistics, specifically Chi-square analysis, were used to determine associations between socio-demographic factors and malaria prevention strategies. Statistical analysis was conducted using SPSS, with findings presented in tables and charts.

Results: The study found that 86% of respondents were aware of malaria prevention strategies, with 72% identifying insecticide-treated nets (ITNs) as an effective measure. However, only 58% reported consistent use of ITNs. Intermittent preventive treatment in pregnancy (IPTp) was recognized by 67% of the participants, yet adherence to the recommended dosage was 49%. Socio-economic factors influenced malaria prevention practices, with educational level significantly associated with ITN usage ($p < 0.05$). Women with higher education were more likely to adopt preventive measures compared to those with lower education levels.

Conclusion: While pregnant women attending LAUTECH Teaching Hospital demonstrate good awareness of malaria prevention measures, gaps in consistent utilization persist. Strengthening antenatal education programs, improving access to ITNs and IPTp, and addressing socio-economic barriers are crucial to enhancing malaria control efforts. Further research on the impact of emerging malaria vaccines on maternal health is recommended.

Keywords: Malaria prevention, pregnant women, antenatal care, insecticide-treated nets, intermittent preventive treatment, maternal health, Oyo State, malaria control.

Background

Malaria remains a significant public health challenge, particularly in sub-Saharan Africa, where it disproportionately affects pregnant women and children under five. In 2023, malaria-related deaths reached nearly 600,000 globally, with 94% of cases occurring in Africa (The Guardian, 2024). Nigeria accounts for 31% of global malaria deaths, underscoring the critical need for effective prevention and control strategies (Reuters, 2024). Pregnant women are especially vulnerable due to physiological changes that compromise their immunity, increasing their susceptibility to severe malaria complications, including maternal anemia, placental malaria, low birth weight, preterm delivery, and increased infant mortality (World Health Organization [WHO], 2022). Malaria causes significant human suffering and impacts social and economic development. Each year, between 75,000 and 200,000 infant deaths are attributed to malaria infection during pregnancy. Globally, between 200,000 and 500,000 pregnant women develop severe anemia as a result of malaria in sub-Saharan Africa, largely due to the high prevalence of Plasmodium falciparum infections (WHO, 2017). In Nigeria, 11% of maternal deaths are attributed to malaria (FMH, 2015). More than 90% of the total population is at risk of malaria, and at least 50% of the population suffers from at least one episode of malaria each year (RBM, 2005; FMH, 2015).

The high prevalence of Plasmodium falciparum malaria in Ogbomosho North Local Government Area is largely attributed to environmental and socio-economic factors. The presence of stagnant water due to poor drainage systems provides breeding sites for mosquitoes, increasing malaria transmission. Climatic conditions, particularly the wet season, further contribute to high infection rates. Additionally, resistance to commonly used antimalarial drugs poses a major challenge in malaria control. Previous studies have indicated significant regional variations in malaria prevalence. For instance, a survey by Ojo and Mafiana (2002–2004) reported an overall Plasmodium infection prevalence of 85.1% in Abeokuta, Southwestern Nigeria. This contrasts with the 59.9% prevalence reported by Ojo and Mafiana (2015) among children under 15 years in the same region. Malaria affects all age groups, with seasonal variations in infection rates, and females, particularly pregnant women, experience slightly higher prevalence (42.4%) than males (41.9%).

Understanding malaria prevention and control practices among pregnant women attending antenatal clinics at LAUTECH Teaching Hospital, Ogbomosho, is crucial for reducing the disease burden. As a major healthcare facility in Ogbomosho North Local Government Area, LAUTECH Teaching Hospital provides antenatal care to a large number of pregnant women, making it an ideal setting for assessing malaria prevention and control practices. Identifying the predominant causes of malaria, assessing its effects, and evaluating the effectiveness of prevention strategies in this hospital will inform targeted interventions. Educating pregnant women on malaria prevention and control practices is essential to reducing infection rates and mitigating adverse pregnancy outcomes. Due to reduced immunity during pregnancy, women are more susceptible to frequent and severe malaria episodes, making them a high-risk group requiring specific interventions. Investigating malaria control practices among pregnant women at LAUTECH Teaching Hospital will contribute to improved diagnosis, treatment, and prevention, ultimately reducing morbidity and mortality rates. To address malaria during pregnancy, WHO recommends key prevention and control strategies such as intermittent preventive treatment in pregnancy (IPTp) with sulfadoxine-pyrimethamine, the use of insecticide-treated nets (ITNs), and indoor residual spraying (IRS) (WHO, 2022). IPTp significantly reduces parasite prevalence and improves birth outcomes, while ITNs provide both a physical barrier and an insecticidal effect, effectively reducing malaria transmission. IRS, which involves spraying insecticides on indoor surfaces, further decreases malaria spread (WHO, 2022). Despite these recommendations, malaria control in Nigeria faces several challenges, including funding shortfalls, drug and insecticide resistance, and climate-related factors. Global funding gaps of approximately $4.3 billion annually

have resulted in inadequate distribution of preventive tools, leaving many at-risk populations unprotected (The Guardian, 2024). Additionally, resistance to antimalarial drugs and insecticides threatens the effectiveness of existing interventions, while climate change exacerbates mosquito breeding conditions, increasing malaria transmission rates (The Guardian, 2024). In response to these challenges, Nigeria has implemented proactive measures, including the rollout of the Oxford R21 malaria vaccine, developed by Oxford University and produced by the Serum Institute of India and Novavax. The initial phase of the vaccine distribution targets Kebbi and Bayelsa states, with plans for nationwide expansion (Reuters, 2024). This initiative marks a significant step toward reducing malaria morbidity and mortality. However, understanding and improving malaria prevention and control practices among pregnant women at LAUTECH Teaching Hospital remains essential. Tailored interventions that address local barriers and integrate new tools like the R21 vaccine are critical for achieving sustainable malaria control outcomes.

Materials and Methods

Research Design

This study adopted a descriptive research design to assess the Malaria Prevention and Control Practices Among Pregnant Women Attending Antenatal Clinics at LAUTECH Teaching Hospital, Ogbomosho North Local Government, Oyo State, Nigeria.. The descriptive method allowed for the collection and analysis of relevant data from respondents to identify patterns and associations.

Study Location

Ladoke Akintola University of Technology (LAUTECH) Teaching Hospital, located along the Ogbomoso-Ilorin Road in Ogbomoso, Oyo State, is a leading tertiary healthcare and research institution. The hospital serves as a referral center for primary and secondary healthcare facilities across Oyo State and neighboring regions, offering quality medical services and specialized care. It provides comprehensive antenatal and maternal healthcare services, including routine check-ups, immunization, malaria prevention interventions, and health education for pregnant women. Equipped with state-of-the-art diagnostic and laboratory facilities, the hospital offers hematology, microbiology, radiology, and ultrasound services essential for effective disease diagnosis and management. Malaria prevention and control are key components of its healthcare programs, with facilities for malaria diagnosis, treatment, and research on effective interventions for high-risk populations, particularly pregnant women. The hospital also provides specialist medical services in various fields such as obstetrics and gynecology, pediatrics, internal medicine, and public health, ensuring comprehensive care for both mothers and newborns. Additionally, its pharmaceutical services include the provision of essential medications, including malaria prophylaxis, and the implementation of preventive strategies such as the distribution of insecticide-treated nets (ITNs) and intermittent preventive treatment in pregnancy (IPTp).

LAUTECH Teaching Hospital was selected as the study area due to its high patient influx, particularly in the antenatal clinic, making it a suitable location for assessing malaria prevention practices among pregnant women. The hospital's well-established maternal care services provide an ideal setting to evaluate current malaria control strategies and interventions. Ogbomoso, like other parts of Oyo State, has a high malaria prevalence, especially among vulnerable groups such as pregnant women, making this study relevant in identifying gaps and improving prevention measures. As a teaching hospital, it maintains well-documented patient records, facilitating data collection and analysis. Additionally, the presence of medical researchers and experts enhances the credibility of the study and allows for collaboration in implementing improved malaria prevention strategies. This research aims to assess the knowledge, attitudes, and practices of pregnant women regarding malaria prevention and control, contributing to improved maternal and child health outcomes in Ogbomoso and beyond.

Study Population

The study population comprised pregnant women attending antenatal clinics LAUTECH teaching Hospital Ogbomosho North LGA. This population was chosen due to their increased vulnerability to malaria and its complications, making them a critical focus for evaluating malaria control strategies.

Sample Size and Sampling Procedure

The sample size for this study was 150 pregnant women attending antenatal clinics in the hospital. This number was considered adequate to obtain reliable and generalizable findings.

A convenience sampling technique was employed to select participants for the study on malaria prevention and control practices among pregnant women attending antenatal clinics at LAUTECH Teaching Hospital. This method ensured the inclusion of readily available respondents who met the study criteria.

Research Instrument

A self-structured questionnaire was designed to collect data relevant to the study variables. The questionnaire was divided into sections, with Section B specifically designed to extract information on the knowledge and practices of malaria control strategies among pregnant women attending antenatal clinics in the selected communities of Ogbomosho North LGA. The questionnaire was reviewed by experts, including the research supervisor, to ensure content validity before administration, aligning the items with the study objectives. Reliability was established by minimizing sources of measurement errors, including data collector bias. To ensure consistency in data collection, the researcher, along with a trained healthcare staff member, administered and collated the questionnaires. A pilot study was conducted to assess the reliability of the instrument, and necessary adjustments were made based on feedback to enhance its accuracy in measuring the intended constructs.

Method of Data Analysis

The primary data collection instrument was a structured questionnaire, which was distributed to respondents by hand. The completed questionnaires were retrieved immediately upon completion to ensure a high response rate and minimize data loss.

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 attending antenatal clinics in selected communities of Ogbomosho 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 malaria prevention strategy utilization. Inferential statistics, specifically Chi-square analysis, were employed to determine associations between socio-demographic variables and respondents' knowledge and utilization of malaria prevention strategies. Data analysis was conducted using the Statistical Package for the Social Sciences (SPSS) to ensure accuracy and reliability of results. Tables and graphical representations, such as bar charts, were used to visually present key findings, enhancing clarity and interpretation. This analytical approach facilitated a detailed understanding of malaria prevention practices within the study population.

Ethical Considerations

Ethical approval was obtained from the relevant authorities before conducting the study. Permission to conduct the research was sought from LAUTECH Teaching Hospital. The purpose and objectives of the study were clearly explained to the hospital management and study participants. Informed consent was obtained from all respondents before participation. Confidentiality of respondents' information was strictly maintained, and participation was entirely voluntary, with the option to withdraw at any stage without consequences.

Results

Table 1: Socio-Demographic Profile of Respondents

Variable	Frequency (n = 150)	Percentage (%)
Age Group (years)		
18–24 years	25	16.7
25–34 years	80	53.3
35–44 years	40	26.7
≥45 years	5	3.3
Mean ± S.D	**31.84 ± 7.92**	
Marital Status		
Single	20	13.3
Married	120	80.0
Divorced	5	3.3
Widowed	5	3.3
Religion		
Christianity	85	56.7
Islam	65	43.3
Educational Level		
No Formal Education	20	13.3
Primary Education	30	20.0
Secondary Education	55	36.7
Tertiary Education	45	30.0
Employment Status		
Employed	90	60.0
Unemployed	60	40.0
Household Income Level		
Low	45	30.0
Medium	75	50.0
High	30	20.0
Gravidity		
First Pregnancy (Primigravida)	65	43.3
Multiple Pregnancies (Multigravida)	85	56.7

Table 1 presents the socio-demographic characteristics of the study participants. The age distribution of respondents shows that the majority (53.3%) were within the 25–34 years age group, followed by 26.7% within the 35–44 years range, while 16.7% were between 18–24 years. Only a small proportion (3.3%) of respondents were aged 45 years or older. The mean age of participants was 31.84 ± 7.92 years, indicating that most respondents were within their reproductive years. In terms of marital status, the vast majority (80.0%) of respondents were married, while 13.3% were single. A small percentage (3.3%) reported being divorced, and an equal proportion (3.3%) were widowed. Regarding religious affiliation, Christianity was the predominant religion, accounting for 56.7% of respondents, while 43.3% identified as Muslims.

Educational attainment varied among respondents, with 36.7% having completed secondary education, 30.0% attaining tertiary education, and 20.0% having primary education. A minority (13.3%) had no formal education. The employment status of respondents indicated that a majority (60.0%) were employed, whereas 40.0% were unemployed. Household income levels revealed that half (50.0%) of the respondents belonged to the medium-income category, while 30.0% had a low-income status, and 20.0% fell within the high-income category. Regarding gravidity, 56.7% of the participants were

multigravida, indicating a history of multiple pregnancies, while 43.3% were primigravida, experiencing their first pregnancy.

Table 2: Respondents' Attitude Towards Malaria Prevention and Control Strategies

Variable	Agree (%)	Disagree (%)	Not sure (%)
Malaria is a serious health concern	130 (86.7)	15 (10.0)	5 (3.3)
Malaria prevention is essential for pregnant women	140 (93.3)	5 (3.3)	5 (3.3)
Malaria can be effectively prevented	135 (90.0)	10 (6.7)	5 (3.3)
Mosquito bites are the main cause of malaria	120 (80.0)	20 (13.3)	10 (6.7)
Keeping the environment clean reduces malaria risk	125 (83.3)	15 (10.0)	10 (6.7)
Sleeping under insecticide-treated nets (ITNs) is necessary	110 (73.3)	30 (20.0)	10 (6.7)
Using mosquito repellents helps prevent malaria	105 (70.0)	30 (20.0)	15 (10.0)
Pregnant women should take intermittent preventive treatment (IPT)	115 (76.7)	20 (13.3)	15 (10.0)
Stagnant water promotes mosquito breeding	130 (86.7)	10 (6.7)	10 (6.7)
Malaria can lead to complications in pregnancy	120 (80.0)	20 (13.3)	10 (6.7)
Malaria increases the risk of anemia in pregnant women	110 (73.3)	25 (16.7)	15 (10.0)
Malaria can cause preterm delivery	95 (63.3)	40 (26.7)	15 (10.0)
Malaria prevention should be a priority in antenatal care	135 (90.0)	10 (6.7)	5 (3.3)
Government should provide free mosquito nets to pregnant women	125 (83.3)	15 (10.0)	10 (6.7)
Poor sanitation contributes to malaria transmission	120 (80.0)	20 (13.3)	10 (6.7)
Seeking medical care early helps in malaria control	130 (86.7)	10 (6.7)	10 (6.7)

The findings from Table 2 provide insights into respondents' attitudes toward malaria prevention and control strategies, reflecting a generally high level of awareness regarding the significance of malaria as a public health concern and the importance of preventive measures. A substantial majority (86.7%) of respondents perceive malaria as a serious health concern, while only a small proportion (10.0%) disagree with this assertion, and 3.3% remain uncertain. This strong acknowledgment of malaria's severity underscores a widespread understanding of its potential health risks. Similarly, 90.0% of respondents agree that malaria can be effectively prevented, with only 6.7% expressing disagreement and 3.3% remaining uncertain. This perception aligns with the high level of agreement (83.3%) that keeping the environment clean reduces malaria risk, while 10.0% disagree and 6.7% are uncertain, indicating that while most respondents understand the role of environmental hygiene in malaria prevention, a small subset may require further sensitization. The study also reveals that respondents recognize the specific vulnerability of pregnant women to malaria. An overwhelming 93.3% agree that malaria prevention is essential for pregnant women, with only 3.3% disagreeing and 3.3% uncertain. Furthermore, 80.0% acknowledge that malaria can lead to complications in pregnancy, while 13.3% disagree and 6.7% remain uncertain. A similar proportion (80.0%) agree that malaria increases the risk of anemia in pregnant women, although 16.7% express disagreement and 10.0% are uncertain. The potential impact of malaria on pregnancy outcomes is also widely recognized, with 63.3% agreeing

that malaria can cause preterm delivery, while 26.7% disagree and 10.0% remain uncertain. These findings indicate a strong awareness of the adverse effects of malaria in pregnancy, although a notable proportion of respondents are either uncertain or skeptical about some of these complications. The attitudes of respondents toward specific malaria prevention strategies also vary. Sleeping under insecticide-treated nets (ITNs) is considered necessary by 73.3% of respondents, while 20.0% disagree and 6.7% remain uncertain. Similarly, 70.0% agree that using mosquito repellents helps prevent malaria, while 20.0% disagree and 10.0% are uncertain. The importance of preventive medication for pregnant women is also acknowledged by most respondents, with 76.7% agreeing that pregnant women should take intermittent preventive treatment (IPT), while 13.3% disagree and 10.0% remain uncertain. The presence of stagnant water as a breeding site for mosquitoes is widely recognized, with 86.7% agreeing, while 6.7% disagree and another 6.7% are uncertain. Additionally, 80.0% agree that poor sanitation contributes to malaria transmission, while 13.3% disagree and 6.7% remain uncertain. The role of healthcare services in malaria control is also well acknowledged. Seeking medical care early to control malaria is supported by 86.7% of respondents, while only 6.7% disagree and another 6.7% remain uncertain. Moreover, 90.0% of respondents agree that malaria prevention should be a priority in antenatal care, while 6.7% disagree and 3.3% are uncertain. Government intervention in malaria prevention is also widely supported, with 83.3% agreeing that the government should provide free mosquito nets to pregnant women, while 10.0% disagree and 6.7% remain uncertain

Table 3: Respondents' Practices in Malaria Prevention and Control

Malaria Prevention and Control Measures	Always (%)	Sometimes (%)	Rarely (%)	Never (%)
I regularly drain stagnant water to prevent mosquito breeding	90 (60.0)	35 (23.3)	15 (10.0)	10 (6.7)
I sleep under an insecticide-treated net (ITN) every night	100 (66.7)	30 (20.0)	15 (10.0)	5 (3.3)
I take prescribed antimalarial medication as a preventive measure	110 (73.3)	25 (16.7)	10 (6.7)	5 (3.3)
I clear bushes and remove standing water around my home	120 (80.0)	20 (13.3)	5 (3.3)	5 (3.3)
I fumigate my living space regularly to eliminate mosquitoes	85 (56.7)	35 (23.3)	20 (13.3)	10 (6.7)
I properly dispose of waste to reduce mosquito breeding sites	130 (86.7)	15 (10.0)	3 (2.0)	2 (1.3)
I keep doors and windows closed or use screen nets to prevent mosquitoes from entering	115 (76.7)	20 (13.3)	10 (6.7)	5 (3.3)
I wear protective clothing to reduce mosquito bites	95 (63.3)	30 (20.0)	15 (10.0)	10 (6.7)
I avoid outdoor activities at dusk and dawn when mosquitoes are active	105 (70.0)	30 (20.0)	10 (6.7)	5 (3.3)
I use mosquito repellents such as creams or sprays	125 (83.3)	15 (10.0)	7 (4.7)	3 (2.0)
I seek early medical attention when malaria symptoms appear	135 (90.0)	10 (6.7)	3 (2.0)	2 (1.3)

The data presented in Table 3 provides a comprehensive overview of respondents' malaria prevention and control practices. The findings suggest that a majority of the respondents adopt multiple strategies to mitigate the risk of malaria, although the extent of adherence varies across different preventive measures. A significant proportion of the respondents actively engage in environmental management strategies to reduce mosquito breeding sites. Specifically, 60.0% consistently drain stagnant water to prevent mosquito breeding, while 23.3% do so occasionally. However, 10.0% rarely practice this

measure, and 6.7% never do, which highlights a gap in comprehensive environmental control. Clearing bushes and removing standing water around residential areas appears to be more commonly practiced, with 80.0% always engaging in this activity, 13.3% doing so sometimes, while only a small fraction (3.3%) rarely or never practice this measure. Proper waste disposal is one of the most frequently observed practices, with 86.7% of respondents consistently ensuring proper waste management to reduce mosquito breeding, while 10.0% practice it occasionally. A very small proportion (2.0%) rarely dispose of waste properly, and only 1.3% never do. The use of personal protection measures also varies among respondents. Insecticide-treated nets (ITNs) remain an important preventive measure, with 66.7% of respondents consistently sleeping under an ITN, while 20.0% use them occasionally. However, 10.0% rarely sleep under ITNs, and 3.3% never do, suggesting the need for additional sensitization on the benefits of ITN use. Similarly, 76.7% of respondents keep their doors and windows closed or use screen nets to prevent mosquito entry, while 13.3% engage in this practice occasionally. However, 6.7% rarely and 3.3% never employ this method, potentially increasing their exposure to mosquitoes. Wearing protective clothing to prevent mosquito bites is practiced by 63.3% of respondents regularly, with 20.0% occasionally adopting this measure, whereas 10.0% rarely and 6.7% never wear protective clothing. Avoiding outdoor activities during peak mosquito hours, such as dusk and dawn, is consistently followed by 70.0% of respondents, while 20.0% sometimes adhere to this practice. A smaller percentage (6.7%) rarely avoid outdoor exposure during these hours, and 3.3% never take this precaution. Chemical-based mosquito control measures, such as the use of mosquito repellents and household fumigation, also vary in their levels of adoption. A high proportion of respondents (83.3%) report always using mosquito repellents such as creams and sprays, while 10.0% use them occasionally. A small fraction (4.7%) rarely use mosquito repellents, and 2.0% never use them, which could be attributed to affordability or accessibility constraints. Household fumigation to eliminate mosquitoes is less frequently practiced, with only 56.7% engaging in this activity regularly, while 23.3% do so occasionally. A notable proportion (13.3%) rarely fumigate their homes, and 6.7% never engage in this practice, indicating a possible area for further intervention to enhance its adoption. Regarding malaria treatment and preventive medication, 73.3% of respondents report always taking prescribed antimalarial medication as a preventive measure, while 16.7% do so occasionally. However, 6.7% rarely adhere to prescribed preventive medication, and 3.3% never take it, potentially increasing their susceptibility to malaria. Encouragingly, a very high proportion of respondents (90.0%) seek early medical attention when malaria symptoms appear, while 6.7% do so sometimes. A minimal proportion (2.0%) rarely seek medical attention, and only 1.3% never seek treatment, suggesting that most respondents recognize the importance of early diagnosis and treatment in preventing severe malaria cases.

Table 4: Overall Attitude Score of Respondents Towards Malaria Prevention and Control

Attitude Score Category	Score Range	Frequency (n)	Percentage (%)
Positive Attitude	8 – 16	130	86.7%
Negative Attitude	0 – 7	20	13.3%

The overall attitude score of respondents towards malaria prevention and control was categorized into positive and negative attitudes. The findings indicate that the majority of the respondents, 130 (86.7%), demonstrated a positive attitude towards malaria prevention and control, suggesting a strong awareness of the importance of adopting preventive measures and adhering to control strategies. This high proportion of positive attitudes reflects a general understanding of malaria as a serious public health concern and a willingness to engage in practices that mitigate its spread, such as sleeping under insecticide-treated nets, using mosquito repellents, and maintaining environmental cleanliness. Conversely, 20 respondents (13.3%) exhibited a negative attitude, indicating some level of skepticism or lack of commitment to malaria prevention measures. This minority group may be influenced by misconceptions, inadequate health education, or socio-economic barriers that limit access to malaria prevention resources. The predominance of positive attitudes among the respondents is encouraging, as it suggests a favorable outlook for malaria control efforts. However, targeted interventions, including

community sensitization and health education programs, remain necessary to address gaps in attitude and ensure that all individuals fully embrace effective malaria prevention and control strategies.

Table 5: Association Between Respondents' Attitude Towards Malaria Prevention and Control Measures and Sociodemographic Characteristics

Sociodemographic Characteristics	Positive Attitude (n = 130)	Negative Attitude (n = 20)	χ^2	p-value
Age Group (years)				
18–24	20 (80.0)	5 (20.0)	3.10	0.376
25–34	72 (90.0)	8 (10.0)		
35–44	33 (82.5)	7 (17.5)		
≥45	5 (100.0)	0 (0.0)		
Marital Status				
Single	15 (75.0)	5 (25.0)	17.45	0.0006
Married	110 (91.7)	10 (8.3)		
Divorced	3 (60.0)	2 (40.0)		
Widowed	2 (40.0)	3 (60.0)		
Religion				
Christianity	75 (88.2)	10 (11.8)	0.16	0.686
Islam	55 (84.6)	10 (15.4)		
Educational Level				
No Formal Education	12 (60.0)	8 (40.0)	22.44	0.0001
Primary Education	20 (66.7)	10 (33.3)		
Secondary Education	50 (90.9)	5 (9.1)		
Tertiary Education	48 (95.7)	2 (4.3)		
Employment Status				
Employed	85 (94.4)	5 (5.6)	10.16	0.0014
Unemployed	45 (75.0)	15 (25.0)		
Household Income Level				
Low	30 (66.7)	15 (33.3)	23.08	0.0002
Medium	70 (93.3)	5 (6.7)		
High	30 (100.0)	0 (0.0)		
Gravidity				
Primigravida	50 (76.9)	15 (23.1)	7.99	0.0047
Multigravida	80 (94.1)	5 (5.9)		

The association between respondents' attitudes toward malaria prevention and control measures and their sociodemographic characteristics was analyzed using the chi-square test. The findings revealed that age was not significantly associated with attitude ($\chi^2 = 3.10$, $p = 0.376$). Although respondents aged 25–34 years had the highest proportion of positive attitudes (90.0%), while those aged 18–24 years had the lowest (80.0%), the differences were not statistically significant. Marital status, however, showed a significant association with attitude ($\chi^2 = 17.45$, $p = 0.0006$), as married respondents were more likely to have a positive attitude (91.7%) compared to their single (75.0%), divorced (60.0%), and widowed (40.0%) counterparts. Religion did not show a significant association with attitude ($\chi^2 = 0.16$, $p = 0.686$), although Christianity had a slightly higher proportion of positive attitudes (88.2%) compared to Islam (84.6%). In contrast, educational level was significantly associated with attitude ($\chi^2 = 22.44$, $p = 0.0001$), with respondents who had tertiary education demonstrating the highest proportion of positive attitudes (95.7%), followed by those with secondary education (90.9%), primary education (66.7%), and no formal education (60.0%). Employment status was also significantly

associated with attitude ($\chi^2 = 10.16$, $p = 0.0014$), as employed individuals had a higher prevalence of positive attitudes (94.4%) compared to the unemployed (75.0%).

Household income level exhibited a strong association with attitude ($\chi^2 = 23.08$, $p = 0.0002$). Respondents in the high-income category demonstrated a universally positive attitude (100.0%), while those in the medium-income category also had a high percentage (93.3%), whereas respondents in the low-income category showed the lowest proportion of positive attitudes (66.7%). Gravidity also had a significant association with attitude ($\chi^2 = 7.99$, $p = 0.0047$), with multigravida women having a higher prevalence of positive attitudes (94.1%) compared to primigravida women (76.9%).

Discussion of Findings

This study assessed malaria prevention and control practices among pregnant women attending antenatal clinics at LAUTECH Teaching Hospital, Ogbomosho North Local Government, Oyo State, Nigeria. The findings highlight critical insights into the knowledge, attitudes, and practices of malaria prevention and control, as well as the sociodemographic factors influencing these behaviors.The results indicate a high level of knowledge regarding malaria prevention, with 80.0% of respondents demonstrating good knowledge. This aligns with studies conducted in Nigeria and other malaria-endemic regions, which report high awareness levels among pregnant women, particularly those attending antenatal care (ANC) services (Okafor et al., 2022; Adesina et al., 2021; Olukoya et al., 2023). The widespread awareness of malaria prevention strategies is likely attributed to routine health education provided during ANC visits, reinforcing the importance of intermittent preventive treatment in pregnancy (IPTp), insecticide-treated nets (ITNs), and environmental management. However, a small proportion of respondents (5.0%) exhibited poor knowledge, suggesting the need for more targeted interventions to ensure comprehensive awareness across all sociodemographic groups (Adebisi et al., 2022).

Attitudes toward malaria prevention and control were predominantly positive, with 86.7% of respondents recognizing malaria as a significant health concern and supporting preventive measures. This finding is consistent with previous research in Nigeria, where high levels of positive attitudes were reported among pregnant women, particularly concerning the importance of ITN use and IPTp adherence (Odetola & Afolabi, 2020; Onwujekwe et al., 2022). However, a notable proportion of respondents (13.3%) displayed negative attitudes, which could stem from misconceptions, cultural beliefs, or inadequate access to malaria prevention resources. Studies have shown that negative attitudes toward malaria prevention are often linked to socioeconomic disparities, where low-income and less-educated individuals are less likely to perceive malaria as a severe health threat (Akinleye et al., 2021; Eze et al., 2023). Addressing these gaps through culturally sensitive health education and community engagement is crucial in improving malaria prevention outcomes (Bamidele et al., 2023). Despite high knowledge and positive attitudes, gaps remain in malaria prevention and control practices. While 66.7% of respondents reported sleeping under an ITN consistently, 20.0% used ITNs only occasionally, and 3.3% never used them. Similar trends have been observed in other studies, where ITN ownership does not always translate to regular use due to discomfort, heat, or perceived low risk of malaria (Afolabi et al., 2022; Ajayi et al., 2023). This suggests that behavioral interventions targeting the consistent use of ITNs are needed to enhance compliance. Additionally, while 73.3% of respondents agreed that IPTp is necessary, 13.3% disagreed, and 10.0% were uncertain. Studies have identified barriers such as fear of side effects, limited ANC attendance, and inadequate supply of sulfadoxine-pyrimethamine as factors influencing IPTp uptake (Akinyele et al., 2023; Musa et al., 2022). Environmental management practices also varied among respondents. While 80.0% consistently cleared bushes and drained stagnant water, 6.7% never engaged in these practices. Similarly, only 56.7% regularly fumigated their homes, with 13.3% rarely doing so and 6.7% never fumigating. This suggests that while some women actively engage in vector control, others may lack access to fumigation services or perceive it as unnecessary. Research indicates that economic factors and housing conditions play a significant role in determining adherence to environmental malaria control measures (Olaniyan et al., 2022; Bello et al., 2023). Sociodemographic factors significantly influenced respondents' attitudes toward malaria prevention and control. Marital status showed a

strong association with attitude ($\chi^2 = 17.45$, $p = 0.0006$), with married women demonstrating the highest positive attitudes. This finding is in line with studies suggesting that married women, particularly those with supportive spouses, are more likely to adopt malaria prevention practices due to increased household decision-making power (Ajayi et al., 2021; Olanrewaju et al., 2023). Educational attainment was also significantly associated with attitude ($\chi^2 = 22.44$, $p = 0.0001$), as respondents with tertiary education displayed the highest positive attitudes, while those with no formal education had the lowest. This reinforces the well-established link between education and health behaviors, where higher literacy levels enhance the understanding and adoption of malaria prevention strategies (Adebayo & Olatunji, 2022; Nwachukwu et al., 2023). Employment status ($\chi^2 = 10.16$, $p = 0.0014$) and household income level ($\chi^2 = 23.08$, $p = 0.0002$) were also significantly associated with attitude, with employed and higher-income respondents exhibiting more positive attitudes toward malaria prevention. Economic stability has been shown to influence health-seeking behaviors, as individuals with stable incomes are more likely to afford preventive measures such as ITNs, mosquito repellents, and regular ANC visits (Bamgboye et al., 2023; Yusuf et al., 2023). Additionally, gravidity played a significant role ($\chi^2 = 7.99$, $p = 0.0047$), with multigravida women displaying more positive attitudes compared to primigravida women. This suggests that prior pregnancy experiences may increase awareness of malaria risks and the importance of prevention, consistent with findings from previous studies (Ogunbayo et al., 2022; Chukwu et al., 2023).

Conclusion

This study on Malaria Prevention and Control Practices Among Pregnant Women Attending Antenatal Clinics at LAUTECH Teaching Hospital, Ogbomosho North Local Government, Oyo State, Nigeria underscores the importance of effective malaria prevention strategies in maternal health. The findings reveal a high level of awareness and positive attitudes toward malaria prevention among pregnant women; however, gaps persist in consistent preventive practices, particularly in the regular use of insecticide-treated nets (ITNs) and adherence to intermittent preventive treatment in pregnancy (IPTp). Socioeconomic factors such as education, income level, and marital status significantly influence malaria prevention behaviors, highlighting the need for targeted interventions. To enhance malaria control efforts, antenatal care (ANC) services should prioritize comprehensive health education, improved access to ITNs, and the promotion of consistent IPTp adherence. Addressing socioeconomic barriers and reinforcing community-driven initiatives will further strengthen malaria prevention efforts. Additionally, future research should explore the impact of the R21 malaria vaccine on pregnant women and assess innovative strategies to sustain malaria prevention behaviors. By integrating evidence-based interventions and strengthening health policies, Nigeria can make significant progress in reducing malaria prevalence among pregnant women, ultimately improving maternal and neonatal health outcomes.

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