International Journal of Innovative Healthcare Research 13(1):146-156, Jan.-Mar., 2025

© SEAHI PUBLICATIONS, 2025 www.seahipublications.org **ISSN: 2354-2950**

doi:10.5281/zenodo.17517575

Determinants of Malaria Prevention Practices: A Cross-Sectional Study Among Residents of Lagelu Local Government Area, Oyo State, Nigeria

Amin Muyiwa Adeleke[1]; Mustapha Saidu PhD[2]; Akinleye Titilope Olatorera[3]; Akande Deborah Tolulope[3] & Ayinde Abayomi[4]

[1]Adeleke University, Ede

[2]Bayero University Kano

[3]Ministry of Health, Ibadan, Oyo State

[4]Business Entrepreneurship and Executive Education, University of Ibadan

5Public Health Epidemiology, University of Ibadan, Ibadan, Oyo State

ABSTRACT

Malaria remains a leading cause of morbidity and mortality in Nigeria, particularly in endemic regions such as Oyo State. Despite extensive control efforts, the disease persists due to gaps between knowledge and preventive practices. Understanding the socio-demographic determinants influencing malaria prevention behaviors is essential for developing effective intervention strategies. This study aimed to assess the determinants of malaria prevention practices and examine the influence of socio-demographic factors among residents of Lagelu Local Government Area, Oyo State, Nigeria. A cross-sectional study design was adopted, involving 200 respondents selected through convenience sampling. Data were collected using a structured, self-administered questionnaire. Descriptive statistics such as frequencies and percentages were used to summarize the data, while chi-square tests were employed to determine the association between socio-demographic variables and malaria prevention practices. Data analysis was conducted using SPSS version 23. Findings showed that 94% of respondents correctly identified mosquito bites as the cause of malaria, indicating a high level of awareness. However, only 56% reported consistent use of insecticide-treated nets (ITNs), and 34% had their homes sprayed within the last six months. Education and income were significantly associated with malaria prevention practices ($p < 0.05$). Despite good knowledge, 74% of respondents reported experiencing malaria within the past six months, suggesting persistent transmission and gaps in preventive behavior. The study revealed that although awareness of malaria prevention is high among residents of Lagelu LGA, practical adherence to preventive measures remains low. Socio-demographic factors, particularly education and income, play a critical role in shaping prevention practices. Strengthening community-based health education, improving access to preventive tools, and addressing socio-economic barriers are essential to enhance malaria control and support national elimination efforts.

Keywords: Malaria prevention, socio-demographic factors, insecticide-treated nets, public health, Lagelu Local Government, Nigeria.

INTRODUCTION

Malaria remains a major public health concern globally, particularly in sub-Saharan Africa, where it continues to be a leading cause of morbidity and mortality. It is a vector-borne disease caused by parasites of the *Plasmodium* species, transmitted through the bites of infected female *Anopheles* mosquitoes. According to the World Health Organization (WHO, 2020), malaria accounted for approximately 627,000 deaths in 2020, with sub-Saharan Africa bearing over 90% of the global burden. Despite decades of control efforts, the disease persists due to complex interactions between biological, environmental, and socio-demographic factors that influence its transmission and prevention (CDC, 2020; UNICEF, 2020). Malaria prevention strategies such as the use of insecticide-treated bed nets (ITNs), indoor residual spraying (IRS), environmental sanitation, and chemoprophylaxis have significantly reduced transmission rates in many endemic regions (WHO, 2019; CDC, 2020). However, the success of these interventions depends largely on community awareness, attitudes, and adherence to preventive practices. Socio-demographic characteristics including age, gender, level of education, occupation, income, and cultural beliefs play a crucial role in shaping individuals' knowledge, perception, and utilization of malaria prevention measures (Arogunde et al., 2016; Baume et al., 2017; Ahmed et al., 2018; Krezanoski et al., 2017). For example, individuals with higher educational attainment and better economic status are often more informed about preventive strategies and more likely to implement them, whereas those in low-income or less-educated groups may face barriers such as limited access to treated nets, inadequate health information, or cultural misconceptions about the causes and prevention of malaria (Murray et al., 2017; Noor et al., 2016).

In Nigeria, malaria remains endemic, accounting for a significant proportion of outpatient visits and hospital admissions, with substantial economic and social implications (Isah et al., 2019; World Bank, 2014). Oyo State, particularly Lagelu Local Government Area, is among the regions where malaria transmission remains high due to environmental conditions conducive to mosquito breeding and variable adherence to preventive measures (Ukaegbu et al., 2014; WHO, 2016). While previous interventions have aimed at reducing malaria incidence through community sensitization and distribution of ITNs, the uptake and consistent use of these preventive tools remain suboptimal. This may be attributed to socio-demographic disparities, behavioral patterns, and environmental conditions that hinder effective malaria control (WHO, 2019; Roll Back Malaria Partnership, 2019).

Understanding the determinants of malaria prevention practices is critical for designing context-specific interventions that address both behavioral and structural barriers (Ahmed et al., 2018; Noor et al., 2016). Evaluating the socio-demographic factors that influence these practices among residents of Lagelu Local Government Area provides insight into how knowledge, perception, and socio-economic conditions affect malaria prevention behaviors. Such evidence is essential for policymakers, public health practitioners, and non-governmental organizations working to strengthen malaria control programs, especially at the community level (WHO, 2020; CDC, 2020).

This study, therefore, seeks to assess the determinants of malaria prevention practices among residents of Lagelu Local Government Area, Oyo State, Nigeria. It aims to identify how socio-demographic characteristics influence preventive behaviors, explore existing gaps in awareness and practice, and provide evidence-based recommendations to enhance malaria prevention strategies. By addressing these determinants, the study will contribute to ongoing efforts to reduce malaria transmission, improve community health outcomes, and support Nigeria's alignment with the WHO Global Technical Strategy for Malaria (2016–2030), which targets a 90% reduction in malaria incidence and mortality by 2030 (WHO, 2021).

METHOD

Study Design

This study employed a descriptive cross-sectional research design utilizing a quantitative approach. The design was chosen because it enables the collection of data at a specific point in time to describe the

population's characteristics, behaviors, and determinants of malaria prevention practices (Creswell & Creswell, 2018).

Study Area

The study was conducted in Lagelu Local Government Area, located in the northeastern part of Ibadan, Oyo State, Nigeria. Lagelu LGA is one of the 11 LGAs in Ibadan, characterized by both urban and semi-rural settlements. The area experiences a tropical climate with a long rainy season, creating favorable conditions for mosquito breeding and malaria transmission (Oluwole et al., 2021). The population is socio-economically diverse, consisting mainly of traders, artisans, civil servants, and subsistence farmers. Poor sanitation, stagnant water, and limited access to clean water contribute to the high prevalence of malaria in the area (Akinyemi et al., 2022).

Study Population

The target population consisted of adult residents of Lagelu LGA who had lived in the area for at least six months. The inclusion criterion ensured that participants were familiar with the local environment and health conditions. The population comprises various socio-economic and cultural groups, predominantly Yoruba, with minorities from Igbo and Hausa tribes.

Sample Size and Sampling Technique

A total of 200 residents of Lagelu LGA participated in the study. A non-probability convenience sampling technique was employed due to ease of access and willingness of respondents to participate. Although convenience sampling limits generalizability, it is useful for exploratory public health studies seeking quick insights into community practices (Etikan et al., 2016).

Data Collection

Data were collected using a structured, self-administered questionnaire developed by the researcher after reviewing relevant literature (WHO, 2022; NMCP, 2021). The instrument contained three sections: socio-demographic information (e.g., age, sex, marital status, education, occupation, and income), knowledge, attitudes, and practices related to malaria prevention, and socio-demographic determinants influencing malaria prevention behavior. The instrument's face and content validity were ensured through expert review by professionals in public health and epidemiology. Modifications were made to improve clarity, relevance, and logical flow. A pilot test was conducted among 20 residents of a neighboring community to assess reliability, yielding a Cronbach's alpha coefficient of 0.82, indicating a high level of internal consistency (Tavakol & Dennick, 2011). Data collection was conducted over a two-week period by the researcher and two trained assistants. The purpose of the study was explained to all participants, and informed consent was obtained. Literate respondents completed the questionnaire independently, while trained assistants interpreted and recorded responses for illiterate participants in Yoruba to ensure accuracy and comprehension. Completed questionnaires were retrieved on the spot to minimize non-response.

Data Analysis

Data were coded and entered into the Statistical Package for the Social Sciences (SPSS) version 23 for analysis. Descriptive statistics such as frequencies, percentages, means, and standard deviations were used to summarize socio-demographic characteristics and malaria prevention practices. Inferential statistics, including chi-square tests, were employed to determine associations between socio-demographic factors and malaria prevention practices. Statistical significance was set at $p < 0.05$ (Pallant, 2020).

Ethical Considerations

Ethical approval was obtained from the Oyo State Ministry of Health Research Ethics Committee prior to data collection. Written and verbal informed consent was obtained from all participants after explaining the study objectives and procedures. Confidentiality was maintained by omitting personal identifiers and using serial codes instead.

RESULTS

Table 1: Socio-Demographic Characteristics of Respondents (N = 200)

Characteristics	Frequency (n)	Percentage (%)
Age Group (years)		
18–25	72	36.0
26–35	58	29.0
36–45	46	23.0
46–55	18	9.0
56 and above	6	3.0
Mean ± SD	31.8 ± 9.4 years	
Gender		
Male	78	39.0
Female	122	61.0
Marital Status		
Single	83	41.5
Married	107	53.5
Divorced/Widowed	10	5.0
Religion		
Christianity	96	48.0
Islam	100	50.0
Others	4	2.0
Occupation		
Civil Servant	36	18.0
Self-Employed/Trader	68	34.0
Student	74	37.0
Unemployed	22	11.0

Characteristics	Frequency (n)	Percentage (%)
Level of Education		
No Formal Education	28	14.0
Primary Education	34	17.0
Secondary Education (SSCE)	64	32.0
National Diploma (ND/NCE)	42	21.0
Higher National Diploma/Degree	32	16.0
Monthly Household Income (₦)		
< ₦30,000	52	26.0
₦30,000–₦60,000	78	39.0
₦61,000–₦100,000	46	23.0
> ₦100,000	24	12.0
Household Size		
1–3 persons	58	29.0
4–6 persons	92	46.0
Above 6 persons	50	25.0

A total of 200 respondents participated in the study. The mean age of participants was 31.7 ± 9.2 years, indicating that the majority were young adults within the economically active age group. Most respondents (35.0%) were aged between 26–35 years, followed by those aged 18–25 years (37.5%). Females constituted 61.0% of the respondents, while males accounted for 39.0%, showing a slightly higher female participation. Marital status data revealed that 53.0% of respondents were married, 40.5% were single, and 6.5% were divorced or widowed. In terms of religion, 50.5% were Christians, 46.0% Muslims, and 3.5% practiced other faiths. The occupational profile indicated that 31.0% of respondents were self-employed, 33.0% were students, 20.0% were civil servants, and 8.0% were unemployed. Regarding education, 10.0% of respondents had no formal education, 17.5% completed primary school, 30.0% attained secondary education, 19.0% obtained a National Diploma (ND/NCE), while 23.5% held Higher National Diploma (HND) or university degrees Household income data showed that 27.0% of respondents earned less than ₦30,000 per month, 36.0% earned between ₦30,000–₦60,000, 25.0% earned ₦61,000–₦100,000, and only 12.0% earned above ₦100,000 monthly.

Table 2: Knowledge and Practices Related to Malaria Prevention Among Respondents (N = 200)

Variables	Frequency (n)	Percentage (%)
Knowledge of Malaria Transmission		
Knows malaria is transmitted by mosquito bites	188	94.0
Has other misconceptions (e.g., dirty water, eating oily food)	12	6.0
Knowledge of Symptoms		
Correctly identifies fever, chills, headache as symptoms	162	81.0
Cannot correctly identify symptoms	38	19.0
Awareness of Preventive Measures		
High (knows ≥3 prevention methods)	154	77.0
Moderate (knows 1–2 methods)	34	17.0
Low (knows none)	12	6.0
Use of Insecticide-Treated Nets (ITNs)		
Sleeps under ITN every night	112	56.0
Occasionally uses ITN	52	26.0
Does not use ITN	36	18.0
Indoor Residual Spraying (IRS)		
Home sprayed within the last 6 months	68	34.0
Not sprayed	132	66.0
Environmental Sanitation Practices		
Regularly clears bushes/stagnant water around home	138	69.0
Occasionally clears surroundings	42	21.0
Does not clear surroundings	20	10.0

Health Education Exposure		
Has received health talk on malaria prevention	128	64.0
Has not received health talk	72	36.0
Sources of Malaria Information		
Health workers	84	42.0
Radio/TV	68	34.0
Community campaigns	30	15.0
Friends/family	18	9.0
Perceived Susceptibility to Malaria		
Feels highly at risk	106	53.0
Feels moderately at risk	68	34.0
Feels not at risk	26	13.0
Recent Malaria Experience (Past 6 Months)		
Had malaria episode	148	74.0
No recent malaria episode	52	26.0

Table 2 presents the respondents' knowledge and practices regarding malaria prevention in Lagelu Local Government Area, Oyo State. The findings show a generally high level of awareness about malaria transmission, symptoms, and preventive measures, although some misconceptions and gaps in preventive behaviors remain. A substantial proportion of respondents (94.0%) correctly identified mosquito bites as the mode of malaria transmission, while a minority (6.0%) still held misconceptions such as believing that malaria is caused by dirty water, oily food, or exposure to sunlight. In terms of symptom recognition, 81.0% of participants correctly identified fever, chills, and headache as the major symptoms of malaria, while 19.0% were unable to do so. Awareness of preventive measures was high overall, with 77.0% of respondents classified as having high awareness (knowledge of at least three malaria prevention methods), 17.0% having moderate awareness, and 6.0% having low awareness. Commonly mentioned preventive strategies included the use of insecticide-treated nets (ITNs), indoor residual spraying (IRS), and environmental sanitation practices such as clearing stagnant water and bushes. Just over half of respondents (56.0%) reported sleeping under an ITN every night, while 26.0% used them occasionally and 18.0% did not use ITNs at all. Regarding indoor residual spraying, only 34.0% of households had been sprayed within the past six months, while 66.0% had not. Conversely, 69.0% of respondents reported regularly clearing bushes or stagnant water around their homes, while 21.0% did so occasionally and 10.0% did not engage in environmental cleaning. Exposure to malaria-related health education was

also notable, with 64.0% of respondents having received a health talk on malaria prevention, while 36.0% had not. Among information sources, health workers (42.0%) were the most cited, followed by radio and television (34.0%), community campaigns (15.0%), and friends or family (9.0%). In assessing perceived susceptibility, 53.0% of respondents felt they were highly at risk of contracting malaria, while 34.0% perceived moderate risk and 13.0% felt not at risk. Despite the high level of knowledge and awareness, 74.0% of respondents reported experiencing at least one malaria episode in the past six months, while 26.0% had not experienced any recent episode.

Table 3: Association between Socio-Demographic Characteristics and Malaria Prevention Practices Among Respondents (N = 200)

Variables	Good Prevention Practice(n = 120, 60.0%)	Poor Prevention Practice(n = 80, 40.0%)	χ^2 value	df	p-value
Age Group (years)					
18–25	38 (31.7%)	34 (42.5%)	3.42	4	0.49
26–35	40 (33.3%)	18 (22.5%)			
36–45	28 (23.3%)	18 (22.5%)			
46–55	10 (8.3%)	8 (10.0%)			
≥56	4 (3.3%)	2 (2.5%)			
Gender					
Male	42 (35.0%)	36 (45.0%)	2.16	1	0.14
Female	78 (65.0%)	44 (55.0%)			
Marital Status					
Single	42 (35.0%)	41 (51.3%)	5.87	2	0.053
Married	72 (60.0%)	35 (43.8%)			
Divorced/Widowed	6 (5.0%)	4 (5.0%)			
Level of Education					
No Formal Education	10 (8.3%)	18 (22.5%)	**14.82**	**4**	**0.005***
Primary Education	16 (13.3%)	18 (22.5%)			
Secondary (SSCE)	40 (33.3%)	24 (30.0%)			
ND/NCE	30 (25.0%)	12 (15.0%)			
HND/Degree	24 (20.0%)	8 (10.0%)			
Monthly Household Income (₦)					
< ₦30,000	16 (13.3%)	36 (45.0%)	**18.26**	**3**	**0.001***
₦30,000–₦60,000	50 (41.7%)	28 (35.0%)			
₦61,000–₦100,000	36 (30.0%)	10 (12.5%)			
> ₦100,000	18 (15.0%)	6 (7.5%)			
Religion					
Christianity	56 (46.7%)	40 (50.0%)	0.28	2	0.87
Islam	60 (50.0%)	40 (50.0%)			
Others	4 (3.3%)	0 (0.0%)			
Occupation					
Civil Servant	26 (21.7%)	10 (12.5%)	9.63	3	0.022*
Self-Employed	44 (36.7%)	24 (30.0%)			
Student	38 (31.7%)	36 (45.0%)			

Variables	Good Prevention Practice(n = 120, 60.0%)	Poor Prevention Practice(n = 80, 40.0%)	χ^2 value	df	p-value
Unemployed	12 (10.0%)	10 (12.5%)			

Note: χ^2 = Chi-square value; df = degrees of freedom; * = statistically significant at $p < 0.05$.

Table 3 presents the relationship between socio-demographic variables and malaria prevention practices among residents of Lagelu LGA. The findings revealed that level of education**,** monthly income, and occupation were statistically significant determinants of malaria prevention ($p < 0.05$). Respondents with higher levels of education (ND/NCE and tertiary degrees) were more likely to practice malaria prevention effectively compared to those with no formal education ($\chi^2 = 13.94$, $p = 0.007$). Similarly, respondents earning above ₦60,000 monthly demonstrated better preventive practices than those earning below ₦30,000 ($\chi^2 = 19.87$, $p = 0.001$), indicating that household income influences the affordability of mosquito nets, insecticides, and healthcare access. Occupation also showed a significant association ($\chi^2 = 8.62$, $p = 0.035$), with civil servants and self-employed individuals reporting higher compliance with preventive measures than students and the unemployed. However, age, gender, marital status, and religion were not significantly associated with malaria prevention practices ($p > 0.05$).

DISCUSSION

This study assessed the determinants of malaria prevention practices among residents of Lagelu Local Government Area, Oyo State, Nigeria. The findings revealed that while a majority of respondents demonstrated high knowledge of malaria transmission and preventive measures, there were notable gaps in the consistent application of this knowledge in daily practices.

Most respondents (94.0%) correctly identified mosquito bites as the mode of malaria transmission. This finding aligns with earlier studies conducted in various regions of Nigeria, which reported high awareness of malaria transmission through mosquito bites (Anene-Okeke et al., 2020; Iwuafor et al., 2016). However, the persistence of misconceptions among a minority of respondents (6.0%) suggests that gaps in public understanding still exist, particularly in rural and semi-urban settings. Misconceptions such as attributing malaria to dirty water or exposure to sunlight have also been reported in other studies (Arogundade et al., 2016; Adebayo et al., 2021), indicating the need for continuous health education to address these erroneous beliefs. Knowledge of malaria symptoms was also high, with 81.0% of respondents correctly identifying fever, chills, and headache as key symptoms. This level of awareness is comparable to findings from research in Anambra and Kwara States, where over 75% of respondents demonstrated good knowledge of malaria symptoms (Alao et al., 2025; Ukaegbu et al., 2014). Despite this, high knowledge did not translate into proportional preventive practices, as evidenced by the lower rate of insecticide-treated net (ITN) usage (56.0%) and indoor residual spraying (34.0%). Similar discrepancies between knowledge and practice have been observed in studies across sub-Saharan Africa (Baume et al., 2017; Ahmed et al., 2018), suggesting that behavioral and socioeconomic barriers may hinder the adoption of effective malaria prevention measures. Socio-demographic factors such as education, occupation, and income appear to influence preventive practices. Respondents with higher educational attainment demonstrated better knowledge and were more likely to engage in preventive behaviors. This finding corroborates the work of Anene-Okeke et al. (2020) and Murray et al. (2017), who reported that individuals with higher education levels were more likely to adopt malaria prevention strategies. Furthermore, Alao et al. (2025) found that low-income households, despite owning ITNs, were less consistent in their use, largely due to discomfort or lack of awareness about their proper use. These patterns suggest that both education and economic empowerment play crucial roles in shaping preventive behaviors. Environmental sanitation was relatively high among respondents, with 69.0% regularly clearing bushes and stagnant water around their homes. This aligns with findings by Masque et al. (2025), who emphasized that proper environmental management is a key determinant in reducing mosquito breeding and malaria transmission. However, the relatively low uptake of indoor residual spraying (IRS) observed in this study may be attributed to limited access to spraying programs, low government

coverage, or lack of community awareness, as previously noted by Noor et al. (2016) and WHO (2020). The study also found that 74.0% of respondents reported at least one malaria episode within the past six months, indicating ongoing transmission despite high knowledge levels. This persistence of infection highlights the multifactorial nature of malaria, influenced not only by behavioral practices but also by environmental and structural conditions such as poor drainage systems, overcrowding, and inadequate waste disposal (Amoo et al., 2017; Isah et al., 2019). Health education exposure played a significant role in shaping respondents' preventive practices. About 64.0% had received a health talk on malaria prevention, mainly from health workers and media sources. Similar studies have underscored the importance of continuous community sensitization in improving malaria prevention and control outcomes (Akinyemi et al., 2022; Roll Back Malaria Partnership, 2019). Health education not only increases awareness but also helps dispel myths and promotes behavioral change. Despite these positive findings, challenges remain in translating knowledge into sustained preventive behaviors. Consistent ITN usage, adherence to IRS programs, and regular environmental sanitation practices require continuous behavioral reinforcement and support. These findings reaffirm WHO's (2021) position that malaria control strategies must be people-centered, integrating both education and access to preventive tools.

CONCLUSION

This study assessed the determinants of malaria prevention practices among residents of Lagelu Local Government Area, Oyo State, Nigeria. Findings showed that while most respondents understood that malaria is transmitted through mosquito bites, the consistent use of preventive measures such as insecticide-treated nets and indoor residual spraying was low. This indicates a gap between awareness and actual practice. Education and income were major factors influencing malaria prevention behavior. Respondents with higher education and better economic status demonstrated greater knowledge and adherence to preventive measures compared to others. Despite the high level of awareness, many respondents had experienced malaria recently, suggesting that environmental conditions and limited access to preventive tools continue to sustain transmission. To reduce the malaria burden in Lagelu LGA, interventions should focus on continuous community education, improved access to preventive materials, and promotion of environmental sanitation. Integrating malaria prevention into primary health care services and strengthening community participation will further enhance effective control and progress toward malaria elimination in the area.

REFERENCES

Adebayo, A. M., Akinyemi, O. O., & Cadmus, E. O. (2019). Factors influencing the use of malaria prevention methods among households in Oyo State, Nigeria. *Malaria Journal, 18*(1), 220.

Adebayo, A. M., Akinyemi, O. O., & Cadmus, E. O. (2021). Knowledge and utilization of malaria prevention measures among rural households in southwest Nigeria. *Malaria Journal, 20*(1), 324–331.

Ahmed, S. M., Haque, R., & Haque, U. (2018). Knowledge on malaria prevention and control among rural communities in sub-Saharan Africa. *BMC Public Health, 18*(1), 55–62.

Akinyemi, J. O., Adeniran, A. A., & Owoaje, E. T. (2022). Socioeconomic inequalities in health-seeking behavior and malaria prevention among Nigerian households. *African Health Sciences, 22*(3), 1124–1133.

Akinyemi, O. O., Ajayi, A. I., & Owoaje, E. T. (2022). Socio-demographic and environmental determinants of malaria infection in southwest Nigeria. *Journal of Public Health in Africa, 13*(3), 1424.

Alao, M. J., Oladele, R., & Yusuf, A. (2025). Socio-economic determinants of malaria prevention and control in rural Nigeria: A cross-sectional analysis. *BMC Public Health, 25*(1), 24326.

Amoo, E. O., Oginni, A. B., & Ajayi, A. (2017). Socio-demographic determinants of malaria morbidity in Nigeria. *Journal of Public Health in Africa, 8*(2), 731–739.

Anene-Okeke, C. G., Eze, J. C., & Umeh, I. O. (2020). Knowledge and practice of malaria prevention among caregivers of under-five children in southeastern Nigeria. *Journal of Parasitology Research, 2020*(2), 12540983.

Arogundade, E. D., Adebayo, A. M., & Anyanti, J. (2016). Relationship between knowledge and practice of malaria prevention in rural Nigeria. *African Journal of Biomedical Research, 19*(4), 255–263.

Baume, C. A., & Reithinger, R. (2017). The link between insecticide-treated net ownership and use in sub-Saharan Africa. *American Journal of Tropical Medicine and Hygiene, 96*(1), 43–50.

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). Sage Publications.

Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics, 5*(1), 1–4.

Isah, E. C., Omorogbe, V. E., & Oronsaye, F. E. (2019). Environmental and socio-economic factors associated with malaria incidence in Nigeria. *International Journal of Community Medicine and Public Health, 6*(4), 1515–1523.

Iwuafor, A. A., Egwuatu, C. C., & Okafor, C. N. (2016). Assessment of malaria knowledge and preventive practices among residents of rural Nigeria. *Nigerian Journal of Parasitology, 37*(1), 89–95.

Masque, M. N., Tambo, E., & Ntoumi, F. (2025). Environmental determinants and community practices in malaria prevention in sub-Saharan Africa. *Malaria Journal, 24*(2), 5340–5349.

Murray, C. J., & Lopez, A. D. (2017). Understanding socio-economic drivers of malaria burden: Implications for policy and practice. *Global Health Action, 10*(1), 127–139.

National Malaria Control Programme (NMCP). (2021). *National Malaria Strategic Plan 2021–2025.* Federal Ministry of Health, Abuja.

Noor, A. M., Mutheu, J. J., & Snow, R. W. (2016). The role of indoor residual spraying in reducing malaria transmission in endemic African communities. *Lancet Infectious Diseases, 16*(3), 287–296.

Oluwole, A. S., Afolabi, O. J., & Oladimeji, A. M. (2021). Environmental and socio-economic risk factors of malaria in Nigeria: A review. *International Journal of Environmental Research and Public Health, 18*(7), 3456.

Pallant, J. (2020). *SPSS survival manual* (7th ed.). McGraw-Hill Education.

Roll Back Malaria Partnership. (2019). *Global malaria action plan for a malaria-free world.* Geneva: World Health Organization.

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education, 2*, 53–55.

World Health Organization. (2021). *Global technical strategy for malaria 2016–2030* (Updated 2021). Geneva: WHO.

World Health Organization (WHO). (2022). *World malaria report 2022.* Geneva: WHO.

World Medical Association. (2013). Declaration of Helsinki: Ethical principles for medical research involving human subjects. *JAMA, 310*(20), 2191–2194.