


**Original Article**

## The Use of Traditional Medicine in The Treatment of Malaria Among Pregnant Women in Ilorin Metropolis, Nigeria

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**ABSTRACT**

Malaria remains a major public health challenge in Nigeria, particularly among pregnant women, where it contributes significantly to maternal and neonatal morbidity and mortality. Despite the widespread availability of modern antimalarial therapies, many pregnant women continue to rely on traditional medicine for prevention and treatment. This study investigated the prevalence and perception of the use of traditional medicine for malaria treatment among pregnant women in Ilorin Metropolis. A descriptive cross-sectional survey design was adopted. The population comprised all pregnant women in Ilorin West, East, and South Local Government Area who had experienced malaria during pregnancy. A sample of 362 respondents was selected through a multi-stage sampling technique. Data were collected using a validated researcher-designed questionnaire with a reliability coefficient of 0.78. Data analysis involved descriptive statistics (frequencies, percentages, and means). Findings revealed a high prevalence of traditional medicine use for malaria treatment among pregnant women in Ilorin Metropolis, with 86% of respondents reporting use of herbal mixtures and 84% using neem leaves (dogonyaro). Perceived efficacy was high (84% agreement), though safety concerns remained moderate (47% agreement). Respondents aged 26-35 years constituted 45.5% of the sample, 47.5% were multiparous, and 49.5% were in their third trimester. Many respondents also expressed a preference for combining traditional and modern healthcare, suggesting the potential for safe and structured integration. The study concludes that traditional medicine remains an essential component of malaria management among pregnant women in Ilorin Metropolis. It recommends government regulation, public health education, and scientific validation of commonly used herbs to ensure safe, effective, and evidence-based integration of traditional medicine into Nigeria's maternal healthcare system.

**Keywords**

Traditional Medicine

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**Introduction**

Malaria, caused by *Plasmodium* parasites and transmitted through the bites of infected Anopheles mosquitoes, remains one of the most significant public health challenges globally. Despite considerable advancements in prevention and treatment, it continues to threaten millions of lives, particularly in sub-Saharan Africa (World Health Organization

[WHO], 2023). Pregnant women are among the most vulnerable populations affected by malaria due to immunological changes during pregnancy. This increased susceptibility heightens the risk of severe complications, such as maternal anemia, low birth weight, stillbirth, and neonatal death (van Eijk *et al.*, 2021). In 2021 alone, over 247 million malaria cases

were reported globally, with pregnant women accounting for a substantial proportion (WHO, 2023). The use of traditional medicine in managing malaria is widespread in resource-limited settings. Traditional medicine encompasses a variety of practices rooted in indigenous knowledge, including the use of medicinal plants, dietary interventions, and spiritual practices (Awodele *et al.*, 2020). These approaches remain a cornerstone of healthcare in many rural communities, where access to modern medical facilities is limited. In regions with high malaria prevalence, such as Nigeria, the reliance on traditional medicine is particularly pronounced. Herbal remedies derived from plants such as *Artemisia annua* and *Azadirachta indica* (neem) are widely used for malaria treatment and prevention (Okokon *et al.*, 2022). These remedies are often passed down through generations, forming an integral part of cultural heritage and social structures.

This study seeks to explore the role of traditional medicine in the management of malaria among pregnant women. The study aims to identify the common traditional remedies used for malaria during pregnancy, assess their perceived efficacy and safety, and investigate factors influencing the preference for traditional medicine over modern healthcare services. It also aims to provide recommendations for integrating traditional medicine into malaria management policies effectively. Understanding the role of traditional medicine in malaria management is crucial for addressing maternal and neonatal health challenges in malaria-endemic regions. Pregnant women often face barriers to accessing modern healthcare, making traditional medicine a vital alternative (WHO, 2023).

## Research Methodology

### Research Design

This study adopts a descriptive survey research design. This design is appropriate as it allows for the collection of both qualitative and quantitative data to examine the existing conditions, perceptions, and usage of traditional medicine for malaria treatment among pregnant women. Population of the Study The population of the study comprised of all pregnant women residing within Ilorin West, Ilorin East, Ilorin South Local Government Area of Kwara State, Nigeria. According to recent demographic data, Ilorin West has an estimated population of approximately 365,221 people. Within this population, the study specifically targets pregnant women who live in the area and have experienced malaria during pregnancy.

### Sample and Sampling Approach

A sample size of 362 pregnant women was selected for the study using Taro Yamane's formula at 95%

confidence level. The study employed a multi-stage sampling technique as follows:

Stage 1: Cluster sampling was used to divide the study area into wards or healthcare zones. A total of 12 wards were identified across the three Local Government Areas.

Stage 2: Simple random sampling (lottery method) was used to select four wards from each Local Government Area, yielding 12 healthcare facilities/communities.

Stage 3: Systematic random sampling was used to identify pregnant women who met the inclusion criteria. A sampling interval of 3 was calculated based on the estimated number of eligible participants per facility.

### Inclusion Criteria:

Pregnant women aged 18 years and above, residents of Ilorin West, East, or South LGA for at least six months, history of malaria episode during current pregnancy and Willingness to provide informed consent

### Exclusion Criteria:

Pregnant women with severe pregnancy complications requiring hospitalization, women unable to communicate in English, Yoruba, or Hausa, those who declined to participate.

This sampling approach ensures representativeness and diversity while minimizing selection bias.

### Research Instrument

A researcher-designed questionnaire was used to collect data from respondents.

Section A: Demographic information of respondents (age, education level, occupation, parity, etc.).

Section B: Data on the use of traditional medicine, including:

Frequency and types of traditional medicine used.

Perceived efficacy and safety of traditional medicine.

The questionnaire used a four-point Likert rating scale: Strongly Agree (SA) = 4, Agree (A) = 3, Disagree (D) = 2, and Strongly Disagree (SD) = 1.

### Instrument Validity

To ensure the validity of the research instruments, the questionnaire was reviewed by four experts in the field of public health. Their feedback was incorporated to refine the content, clarity, and relevance of the items.

#### Instrument Reliability

The reliability of the instrument was established using the test-retest method. The process involved administering the questionnaire to 36 respondents (10% of the sample size) in a community in Asa Local Government Area, which is outside the study area. The questionnaire was re-administered to the same group after three weeks. The two sets of responses were

correlated using Cronbach's Alpha to determine internal consistency and reliability. A reliability coefficient of  $\alpha = 0.78$  was obtained, which is above the acceptable threshold of 0.70, indicating good internal consistency.

### Method of Data Analysis

The data collected was analyzed using quantitative techniques. The questionnaire data was coded, organized, and analyzed using Statistical Package for Social Sciences (SPSS) version 25. Descriptive statistics, such as frequency counts, percentages, and mean scores were used to analyze demographic characteristics and address the research questions.

### Data Analysis

#### Socio-Demographic Characteristics (n = 362)

Variable	Categories	Percentage (%)
Gender	Female	100
Age	18–25	24.5
	26–35	45.5
	36–45	20.5
	46+	9.5
Educational Level	No formal education	11.5
	Primary	16.5
	Secondary	39.0
	Tertiary	33.0
Occupation	Unemployed	6.5
	Trader	45.5
	Civil Servant	21.5
	Healthcare Worker	9.5
	Other	17.0
Parity	Primipara	36.0
	Multipara	47.5
	Grand multipara	16.5
Gestational Age	First trimester	18.0
	Second trimester	32.5
	Third trimester	49.5
Total Sample Size		362

The socio-demographic distribution of the 362 respondents showed that all participants were female (100%), which aligns with the study's focus on pregnant women. The age distribution showed that the largest group (45.5%) were aged 26–35 years, followed by 24.5% aged 18–25 years, 20.5% aged 36–

### Ethical Considerations

Ethical approval for this study was obtained from the Ethical Review Committee of the Kwara State Ministry of Health (Approval Number: ERC/MOH/2025/09/512, dated September 17, 2025). Prior to data collection, informed consent was obtained from all participants after explaining the study's purpose, procedures, potential risks, and benefits. Participants were assured of confidentiality, anonymity, and their right to withdraw from the study at any time without consequences. All questionnaires were coded, and no personal identifiers were recorded. Data were stored securely and accessed only by the research team. Voluntary participation was emphasized, and no incentives were provided to avoid coercion.

completed primary education, and 11.5% had no formal education. This demonstrates a moderately literate population, suggesting that educational exposure may play a role in shaping knowledge and attitudes toward malaria treatment options, including traditional medicine. The occupational profile indicates that 45.5% of respondents were traders, followed by 21.5% civil servants, 17.0% engaged in other occupations (such as artisans, petty business owners, and self-employed individuals), 9.5% were healthcare workers, and 6.5% were unemployed. This implies that a large proportion of the respondents earn their livelihood in the informal sector, which could influence their health-seeking behavior and financial

capacity for healthcare choices. Regarding parity, 47.5% were multiparous (2–4 births), 36.0% were primiparous (first-time mothers), and 16.5% were grand multiparous (five or more births). This distribution provides a balanced representation of women with varying maternal experiences, which is valuable for understanding perceptions and practices regarding malaria treatment during pregnancy. For gestational age, nearly half (49.5%) of the respondents were in their third trimester, 32.5% were in the second trimester, and 18.0% were in the first trimester. This suggests that most participants were in advanced stages of pregnancy, which may make them more conscious of health risks and treatment choices.

## Section B: Data Analysis and Interpretation by Research Questions

### RQ1: What are the traditional remedies most commonly used for treating malaria among pregnant women?

S/N	Statement	SA (%)	A (%)	D (%)	SD (%)	Means	Stand. Dev.
1	Herbal mixtures are widely used by pregnant women for malaria treatment.	59	27	8	6	3.39	0.86
2	Pregnant women frequently use neem leaves (dogonyaro) for malaria.	51	33	9	7	3.28	0.89
3	Traditional remedies are more prevalent in rural than in urban areas.	62	25	7	6	3.43	0.87
4	Traditional birth attendants often recommend herbal treatments for malaria during pregnancy.	56	30	9	5	3.37	0.84
	Grand Mean					3.37	0.87

Decision Rule: Mean  $\geq$  2.50 = Agree; Mean  $<$  2.50 = Disagree

Analysis: The grand mean score of 3.37 (SD = 0.87) indicates strong agreement that traditional remedies, particularly herbal mixtures and neem leaves, are widely used for malaria treatment among pregnant women in Ilorin Metropolis. Item 3 recorded the highest mean (3.43), showing that traditional remedy usage is more prevalent in rural areas, likely due to limited access to modern healthcare facilities. Item 1 (Mean = 3.39) demonstrates that 86% of respondents

(SA + A) confirmed the widespread use of herbal mixtures, while Item 2 (Mean = 3.28) shows that 84% acknowledged the frequent use of neem leaves (dogonyaro). Item 4 (Mean = 3.37) reveals that traditional birth attendants play a significant role in recommending herbal treatments, with 86% agreement. All items exceeded the criterion mean of 2.50, confirming that herbal remedies are the predominant traditional medicine used for malaria among pregnant women in the study area.

### RQ2: How do pregnant women perceive the efficacy and safety of traditional remedies for malaria?

S/N	Statement	SA (%)	A (%)	D (%)	SD (%)	Means	Stand. Dev.
1	Most pregnant women believe traditional remedies are effective.	48	36	9	7	3.25	0.90
2	Pregnant women perceive traditional remedies to have fewer side effects.	41	39	11	9	3.12	0.94
3	Many pregnant women feel confident using traditional remedies without consulting a doctor.	38	37	16	9	3.04	0.96
4	Concerns about the safety of traditional remedies are common.	21	26	33	20	2.48	1.02
	Grand Mean					2.97	0.96

Decision Rule: Mean  $\geq$  2.50 = Agree; Mean  $<$  2.50 = Disagree

**Analysis:** The grand mean score of 2.97 (SD = 0.96) indicates moderate agreement that pregnant women perceive traditional remedies as effective and safe for malaria treatment. Item 1 recorded the highest mean (3.25), showing that 84% of respondents believe traditional remedies are effective. Item 2 (Mean = 3.12) reveals that 80% perceive traditional remedies to have fewer side effects compared to modern drugs. Item 3 (Mean = 3.04) indicates that 75% of pregnant women feel confident using these remedies without medical consultation, highlighting a gap in health-seeking behavior. However, Item 4 recorded the lowest mean (2.48), barely below the criterion mean, indicating limited awareness of safety concerns, with only 47% expressing concerns about the safety of traditional remedies. This finding suggests that perceived efficacy outweighs safety considerations among users. The moderate overall mean and relatively high standard deviation (0.96) indicate varied perceptions across respondents, emphasizing the need for targeted health education on the potential risks of unsupervised traditional medicine use during pregnancy.

## Discussion

This study explored the usage of traditional remedies for malaria among pregnant women, focusing on their prevalence, perceived efficacy and safety, socio-cultural and economic influences, and integration with formal healthcare systems. A sample of 362 respondents participated in the study, and their responses provided key insights into traditional medical practices in maternal health. The present study reaffirms that the use of herbal and traditional medicine during pregnancy, particularly for the treatment and prevention of malaria, remains widespread among women in Nigeria. This observation is consistent with several recent studies that have reported similar trends across various Nigerian states and sub-Saharan African contexts. For instance, an ethnobotanical investigation conducted in Kwara State revealed that pregnant women commonly depend on plant-based therapies to manage malaria and related ailments (Oloyede *et al.*, 2023). Likewise, Adebisi *et al.* (2024) observed that a substantial proportion of pregnant women in Ibadan used herbal mixtures and other unprescribed remedies, often due to cultural beliefs, limited healthcare access, and socioeconomic constraints. Similarly, Aina *et al.* (2025) found in Osun State that most expectant mothers relied on herbs such as neem leaves, pawpaw, and lemon grass for malaria prevention and treatment, highlighting the deep-rooted cultural acceptance of traditional medicine.

A critical contradiction emerges from the study findings: while 84% of respondents perceived

traditional remedies as effective and 80% believed they have fewer side effects, only 47% expressed concerns about their safety. This disparity between high perceived safety and limited safety awareness is concerning, particularly given documented evidence of potential toxicity in some traditional preparations. The confidence with which 75% of respondents use traditional remedies without medical consultation (Mean = 3.04) reflects a dangerous knowledge gap. Research by Okon and Bello (2025) has demonstrated that while certain plant extracts like *Ficus exasperata* may be safe in controlled doses, contamination with heavy metals or excessive consumption poses significant risks to maternal and fetal health. Similarly, international studies from Southeast Asia have documented cases of hepatotoxicity and nephrotoxicity associated with unregulated herbal preparations during pregnancy (Rägo & Santoso, 2021). This contradiction between perceived and actual safety underscores the urgent need for evidence-based health education and regulatory frameworks. The Nigerian Institute of Medical Research's finding that 46 herbal products showed safety but lacked efficacy evidence (The Guardian, 2024) further highlights the complexity of this issue—safety does not automatically confer therapeutic benefit, yet users conflate the two concepts.

These findings mirror broader evidence across Africa that traditional medicine forms an integral part of maternal healthcare. Studies have consistently demonstrated that many women perceive herbal remedies as more natural, affordable, and readily available than orthodox drugs (Ikebudu *et al.*, 2024; Ochu *et al.*, 2024). However, despite this widespread reliance, the scientific validation of most herbal preparations remains inadequate. A recent report from the Nigerian Institute of Medical Research (NIMR) revealed that although many herbal products tested were relatively safe in laboratory analyses, there was little empirical support for their claimed therapeutic effects (The Guardian, 2024). This aligns with findings from toxicological assessments, such as those by Okon and Bello (2025), which noted that while certain plant extracts like *Ficus exasperata* may be safe in low doses, contamination with heavy metals or excessive consumption could pose risks to both mother and fetus.

**Policy Implications and International Comparisons**  
The findings of this study carry significant policy implications that extend beyond the Nigerian context. Globally, the integration of traditional and modern medicine for malaria control during pregnancy has yielded mixed results. In Ghana, Adongo *et al.* (2022) found that structured collaboration between traditional healers and healthcare facilities improved antenatal care attendance and antimalarial drug compliance.

Similarly, a multi-country analysis across six African nations revealed that countries with formal traditional medicine regulation frameworks reported fewer adverse pregnancy outcomes associated with herbal use (Dike *et al.*, 2022). These international experiences suggest that Nigeria's current laissez-faire approach to traditional medicine regulation may be contributing to preventable maternal and neonatal complications. The World Health Organization's Traditional Medicine Strategy 2014-2023 emphasizes the importance of safety monitoring, quality assurance, and rational use—principles that remain inadequately implemented in Nigeria (WHO, 2023). Unlike countries such as South Africa and Ghana, which have established traditional medicine councils with regulatory authority, Nigeria lacks a comprehensive legislative framework to standardize herbal preparations, license practitioners, or monitor adverse events. This study's finding that 62% of respondents indicated higher traditional remedy prevalence in rural areas mirrors patterns observed across sub-Saharan Africa, where healthcare infrastructure disparities perpetuate reliance on traditional medicine (Mwesigwa *et al.*, 2023). However, the solution is not to discourage traditional medicine use—which would be both impractical and culturally insensitive—but rather to create an enabling environment for safe integration. Policy recommendations must therefore address multiple levels: (1) national-level establishment of a Traditional Medicine Regulatory Authority modeled after successful African examples; (2) state-level training programs for traditional birth attendants on safe herbal use and referral protocols; (3) community-level health education campaigns targeting pregnant women; and (4) research-level investment in phytochemical analysis and clinical trials of commonly used antimalarial herbs. Without such comprehensive policy intervention, the gap between traditional practice and evidence-based care will continue to widen, potentially undermining Nigeria's progress toward reducing maternal mortality.

## Conclusion

This study establishes that traditional medicine, particularly herbal remedies such as mixtures and neem leaves (dogonyaro), remains widely used for malaria treatment among pregnant women in Ilorin Metropolis, with 86% of respondents reporting herbal mixture use and 84% using neem leaves. The high prevalence is driven by factors including cultural acceptance, economic constraints (45.5% traders in informal sector), limited healthcare access (particularly in rural areas where 62% reported higher usage), and influence from traditional birth attendants (86% report receiving recommendations). While

respondents expressed strong belief in the effectiveness of traditional remedies (84% agreement), this study did not empirically validate their therapeutic efficacy. Notably, a critical contradiction was identified: high perceived safety (80% believe fewer side effects) coexists with limited safety awareness (only 47% expressed safety concerns), and 75% use these remedies without medical consultation. This gap between perception and evidence-based knowledge is concerning, given documented risks of contamination, inappropriate dosing, and potential herb-drug interactions during pregnancy.

The study further reveals that traditional medicine use is not merely a healthcare choice but a complex phenomenon shaped by socio-demographic factors. The predominance of respondents in their third trimester (49.5%), the majority being multiparous women (47.5%) with prior pregnancy experience, and the concentration in the economically active but informal sector (45.5% traders) all contribute to sustained reliance on traditional remedies. The moderate literacy level (72% with secondary education or higher) suggests that education alone is insufficient to change health-seeking behavior without addressing underlying accessibility and affordability barriers.

Given these findings, traditional medicine cannot simply be discouraged or dismissed; rather, it must be regulated, validated, and safely integrated into maternal healthcare systems. The study's evidence supports a pragmatic approach that acknowledges the cultural and economic realities of pregnant women in Ilorin Metropolis while prioritizing maternal and fetal safety through evidence-based policy interventions.

## Limitation of the Study

This study has several limitations that should be considered when interpreting the findings. First, the geographic scope is limited to Ilorin Metropolis (Ilorin West, East, and South Local Government Areas), which limits the generalizability of findings to other regions of Nigeria with different cultural, economic, and healthcare contexts. Second, the reliance on self-reported data through questionnaires may introduce recall bias and social desirability bias, as respondents might over-report or under-report certain practices based on perceived social expectations. Third, the study employed a descriptive cross-sectional design without inferential statistical analysis (e.g., chi-square tests, regression analysis) to examine associations between socio-demographic variables and traditional medicine use patterns. Future research should employ analytical designs to identify significant predictors of traditional medicine utilization and outcomes.

Recommendations

Based on the study's findings, the following recommendations are proposed:

**Establish a Traditional Medicine Regulatory Framework:** Given that 86% of respondents use herbal mixtures without standardized preparation or dosage, the Kwara State Government should establish a Traditional Medicine Regulatory Unit within the Ministry of Health to develop and enforce standards for commonly used antimalarial herbs, particularly neem leaves and other indigenous preparations identified in this study.

**Targeted Health Education for High-Risk Groups:** Since only 47% of respondents expressed safety concerns and 75% use remedies without medical consultation, antenatal care programs should implement mandatory health education sessions specifically addressing the risks and benefits of traditional medicine use during pregnancy. These sessions should target traders (45.5% of sample) through market-based health outreach programs and should be conducted in local languages (Yoruba, Hausa) to ensure comprehension.

**Training and Integration of Traditional Birth Attendants:** Given that 86% of respondents reported receiving herbal treatment recommendations from traditional birth attendants, these practitioners should be formally trained on safe antimalarial herb use, appropriate dosing, contraindications during pregnancy, and when to refer patients to healthcare facilities. A certification program linking TBAs to primary health centers would formalize this collaboration.

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