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PREVALENCE, CAUSES, AND HEALTH EFFECTS OF MALARIA AMONG CHILDREN IN OMU-IJEBU, OGUN STATE, NIGERIA

[1]OTUJO, Caroline Oghenebroka, & [2]OGUN, Adetoun Oluyemi and [3]ODUSOTE, Oluwatoyin Idowu
[1,2,3] Sikiru Adetona College of Education, Science and Technology (SACOETEC), Omu-Ajose, Ogun State.
E-mail; cotujo65@gmail.com, ogunadetoun25@gmail.com , Ifedetoyin2000@gmail.com

Abstract
Malaria remains one of the leading causes of morbidity and mortality among children in sub-Saharan Africa, particularly in Nigeria where the disease constitutes a major public health challenge. This study investigated the prevalence, causes, and health effects of malaria among children in Omu-Ijebu, Ogun State, Nigeria. The study adopted a descriptive survey research design involving healthcare professionals including nurses, doctors, and community health workers. A structured questionnaire was administered to fifty respondents selected through purposive sampling. Data collected were analyzed using descriptive statistics and chi-square inferential statistics with the aid of Statistical Package for Social Sciences (SPSS) version 23 at a 0.05 level of significance. Findings revealed that poor environmental sanitation, mosquito breeding sites, inadequate use of insecticide-treated nets, poor drainage systems, and limited access to preventive healthcare services were major causes of malaria among children. The study further showed that malaria contributes significantly to anemia, school absenteeism, reduced cognitive performance, malnutrition, and increased mortality among children. The study concluded that although awareness about malaria prevention exists among residents and healthcare workers, challenges relating to environmental management and healthcare access continue to sustain high malaria prevalence among children. The study recommended intensified public health education, improved environmental sanitation, wider distribution of insecticide-treated bed nets, indoor residual spraying, and enhanced government support for malaria prevention programs.

Keywords: Malaria, Children, Public Health, Malaria Prevention, Ogun State, Nigeria, Mosquito Control, Malaria Epidemiology

Introduction

Malaria is a life-threatening parasitic disease caused primarily by *Plasmodium falciparum* and transmitted through the bite of infected female *Anopheles* mosquitoes. Malaria remains one of the most serious public health challenges affecting developing countries, particularly in sub-Saharan Africa. The disease is caused by *Plasmodium* parasites and transmitted through the bite of infected female *Anopheles* mosquitoes (World Health Organization [WHO], 2018). According to WHO (2024), malaria accounted for over 260 million cases worldwide, with Africa contributing approximately 95% of the global burden. Malaria continues to contribute significantly to morbidity

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and mortality among children under the age of five years due to weak immunity and poor access to healthcare services (UNICEF, 2017).
Nigeria remains the country most affected by malaria and contributes nearly one-quarter of global malaria cases and approximately one-third of malaria-related deaths (WHO, 2023; WHO, 2024).

Globally, malaria accounts for millions of deaths annually, with Africa bearing the highest burden of the disease. According to the World Health Organization, approximately 219 million malaria cases and over 435,000 malaria-related deaths were recorded worldwide in 2017, with children accounting for a large proportion of these deaths. Nigeria alone contributes significantly to the global malaria burden because of favorable environmental conditions for mosquito breeding, inadequate sanitation, poverty, and limited access to quality healthcare services (Federal Ministry of Health [FMOH], 2015). According to the World Health Organization, malaria accounted for approximately 249 million cases and 608,000 deaths globally in 2022, with Africa contributing over 94% of the total burden (WHO, 2023). Recent reports indicate that malaria remains one of the leading causes of outpatient attendance, hospitalization, and mortality among Nigerian children (UNICEF, 2023; UNICEF, 2024).

Nigeria bears the highest malaria burden worldwide, accounting for approximately 27% of global malaria cases and 31% of malaria-related deaths. Children under five years of age remain the most vulnerable population due to their immature immune systems and increased susceptibility to severe infection. Malaria contributes substantially to childhood anemia, malnutrition, impaired cognitive development, educational disruption, and mortality (WHO, 2023).
Children are particularly vulnerable because of their immature immune systems and increased susceptibility to severe infection. Malaria contributes significantly to anemia, malnutrition, impaired cognitive development, and mortality among children (White et al., 2014; Zhang et al., 2022). According to White et al..(2014), Severe malaria among children often results in fever, anemia, convulsion, respiratory distress, malnutrition, and death if not properly treated. Recurrent malaria episodes also negatively affect cognitive development, school attendance, and educational performance among school-age children (Snow et al., 2015). Okonkwo et al., (2023) reported that repeated malaria infections have been shown to negatively affect school attendance and educational outcomes among school-aged children.
The burden of malaria extends beyond health consequences and significantly affects economic productivity and social development. Families incur substantial healthcare expenses due to treatment costs, transportation, and loss of productive working hours (Alaba & Alaba, 2010). The disease also places considerable pressure on healthcare systems already challenged by limited resources.
Environmental conditions play a critical role in malaria transmission. Hay et al. (2010) reported that stagnant water, blocked drainage channels, refuse dumps, and poor sanitation create favorable breeding sites for mosquito vectors. Similarly, Adekunle et al. (2024) and Chiziba et al. (2024) identified environmental sanitation as one of the strongest predictors of malaria prevalence among children in Nigerian communities.
In response to the burden of malaria, several interventions have been implemented, including insecticide-treated nets (ITNs), indoor residual spraying, rapid diagnostic testing, artemisinin-based combination therapies, and environmental sanitation programmes (WHO, 2015; Federal

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Ministry of Health [FMOH], 2021). More recently, malaria vaccination programmes have been introduced as additional preventive tools (WHO, 2024).Despite these interventions, malaria prevalence remains high in many rural areas because of poor implementation and inadequate awareness among community members (Oresanya, Hoshen, & Sofola, 2011).

Recent studies have demonstrated that environmental and socioeconomic factors continue to drive malaria transmission in Nigeria. Adekunle et al. (2024) reported that children living in poorly sanitized environments were significantly more likely to contract malaria than those residing in cleaner communities. Similarly, Yusuf and Lawal (2024) observed that inadequate utilization of ITNs remained a major challenge among caregivers despite high awareness levels.

In Ogun State, particularly in Omu-Ijebu, malaria continues to affect children due to inadequate sanitation facilities, poor drainage systems, and limited healthcare resources. The persistence of malaria among children in this community necessitates continuous research and public health interventions aimed at reducing the burden of the disease.

Although previous studies have examined malaria prevalence in various parts of Nigeria, limited studies have specifically focused on the causes and health effects of malaria among children in Omu-Ijebu, Ogun State. This study therefore seeks to bridge this knowledge gap by investigating the causes and effects of malaria among children within the study area.

Malaria remains one of the most serious infectious diseases affecting populations in tropical and subtropical regions, particularly in sub-Saharan Africa. The disease is caused by protozoan parasites of the genus *Plasmodium* and transmitted through the bites of infected female *Anopheles* mosquitoes (White et al., 2014; World Health Organization [WHO], 2024). Despite substantial progress in malaria prevention and treatment over the past two decades, malaria continues to pose significant public health challenges globally, especially among children under five years of age (WHO, 2021, 2022, 2023, 2024).

According to WHO (2024), malaria accounted for over 260 million cases worldwide, with Africa contributing approximately 95% of the global burden. Nigeria remains the country most affected by malaria and contributes nearly one-quarter of global malaria cases and approximately one-third of malaria-related deaths (WHO, 2023; WHO, 2024). Recent reports indicate that malaria remains one of the leading causes of outpatient attendance, hospitalization, and mortality among Nigerian children (UNICEF, 2023; UNICEF, 2024).

Statement of the Problem

Malaria continues to be a major cause of illness and death among children in Nigeria despite numerous public health interventions. In Omu-Ijebu, the persistent occurrence of malaria among children has raised concerns among healthcare workers, parents, and educational stakeholders. Children frequently suffer repeated malaria episodes which negatively affect their growth, nutritional status, educational performance, and overall wellbeing.

Several factors including environmental sanitation problems, inadequate preventive practices, low utilization of insecticide-treated nets, poor drainage systems, and limited access to quality healthcare services contribute to sustained malaria transmission. Furthermore, many households lack adequate knowledge regarding effective malaria prevention strategies.

Although previous studies have examined malaria prevalence in various parts of Nigeria, limited studies have specifically focused on the causes and health effects of malaria among children in Omu-Ijebu, Ogun State. This study therefore seeks to bridge this knowledge gap by investigating the causes and effects of malaria among children within the study area.

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Objectives of the Study

The broad objective of this study was to investigate the causes and effects of malaria among children in Omu-Ijebu, Ogun State.

The specific objectives were to:

1. Examine the major causes of malaria among children in Omu-Ijebu.
2. Assess the health effects of malaria among children.
3. Determine the role of environmental sanitation in malaria transmission.
4. Evaluate awareness and preventive practices against malaria among caregivers.
5. Suggest effective strategies for malaria prevention and control.

Research Questions

The study addressed the following research questions:

1. What are the major causes of malaria among children in Omu-Ijebu?
2. What health effects does malaria have on children?
3. How does environmental sanitation influence malaria transmission?
4. What preventive measures are commonly adopted by caregivers?
5. What strategies can effectively reduce malaria prevalence among children?

Research Hypotheses

The following hypotheses guided the study:

- $H0_1$: There is no significant relationship between environmental sanitation and malaria prevalence among children.
- $H0_2$: There is no significant relationship between malaria infection and the health status of children.

Literature Review

Concept of Malaria

Malaria is an infectious disease caused by protozoan parasites belonging to the genus *Plasmodium* (White et al., 2014). The disease is transmitted primarily through the bites of infected female *Anopheles* mosquitoes. The major species affecting humans include *Plasmodium falciparum*, *P. vivax, P. malariae, P. ovale*, and *P. knowlesi*. Among these, *P. falciparum* is the most dangerous and accounts for the majority of malaria deaths in Africa.Malaria transmission occurs predominantly in areas with warm temperatures and high humidity that favor mosquito breeding. Rural and peri-urban communities with poor sanitation are particularly vulnerable.

The disease is transmitted primarily through the bites of infected female *Anopheles* mosquitoes and remains a major public health challenge worldwide (WHO, 2024). Among the various species affecting humans, *Plasmodium falciparum* is responsible for the majority of severe malaria cases and deaths in Africa (Greenwood et al., 2015).

Epidemiology of Malaria in Nigeria

Nigeria bears the highest malaria burden globally (WHO, 2023). National malaria surveys indicate that children under five years remain the most affected population group due to limited acquired

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immunity (Nigeria Malaria Indicator Survey, 2021). Isiko et al. (2024) reported that environmental and socioeconomic factors significantly influence malaria risk among Nigerian children.

Adebayo et al. (2023) found that malaria prevalence among school-aged children in Southwestern Nigeria remained above 40%, despite extensive public health campaigns. Similarly, Ibrahim and Yusuf (2022) reported persistently high malaria prevalence among children in Northern Nigeria.

Environmental Determinants of Malaria

Environmental sanitation has been consistently identified as a major determinant of malaria transmission (Hay et al., 2010). Stagnant water bodies, blocked drainage systems, bushy surroundings, and poor waste disposal practices create favorable conditions for mosquito breeding (Adekunle et al., 2024).

Chiziba et al. (2024) found that children living in poorly sanitized environments were significantly more likely to contract malaria than those residing in cleaner communities. Similar findings were reported by Ezeh et al. (2024), who identified environmental sanitation as a major predictor of malaria infection among under-five children in Nigeria.

Socioeconomic Determinants

Socioeconomic status influences malaria risk and healthcare-seeking behavior (Alaba & Alaba, 2010). Poverty limits access to preventive tools such as insecticide-treated nets and quality healthcare services. Families living in poor housing conditions are often more exposed to mosquito bites and delayed treatment seeking (Ibrahim & Yusuf, 2022).

Utilization of Insecticide-Treated Nets

Insecticide-treated nets remain one of the most effective malaria prevention tools (WHO, 2015). Oresanya et al. (2011) reported that consistent use of ITNs significantly reduced malaria infection among under-five children. Similarly, Afolabi et al. (2015) found that households possessing and regularly utilizing treated mosquito nets recorded lower malaria prevalence.

Recent evidence suggests that utilization remains suboptimal despite high awareness levels. Yusuf and Lawal (2024) observed that many caregivers fail to use mosquito nets consistently because of discomfort, heat, and cultural beliefs.

Health Effects of Malaria Among Children

Repeated malaria infections contribute significantly to anemia among children (WHO, 2024). White et al. (2014) noted that destruction of red blood cells during malaria episodes often results in severe anemia, delayed growth, and increased mortality.

Malaria also contributes to poor nutritional outcomes and reduced cognitive performance (Zhang et al., 2022). Okonkwo et al. (2023) found that recurrent malaria infections negatively affected school attendance and academic achievement among primary school pupils in Nigeria.

Empirical Review

A study conducted by Ibrahim and Yusuf (2022) in northern Nigeria reported that poor environmental sanitation and low ITN utilization significantly increased malaria prevalence among children.

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Similarly, Adekunle et al. (2024) found that children living in households with stagnant water around their homes were three times more likely to contract malaria compared to those in cleaner environments.

Another study by Okonkwo et al. (2023) showed that repeated malaria infections negatively affected school attendance and cognitive performance among primary school pupils in southeastern Nigeria.

The reviewed literature indicates that malaria remains strongly associated with environmental, socioeconomic, and healthcare-related factors.

Methodology

Data collected were analyzed using descriptive statistics including frequency counts and percentages. Chi-square statistical analysis was used to test the hypotheses at a 0.05 significance level using SPSS version 23.

The study adopted a descriptive survey research design. This design was considered appropriate because it facilitated systematic collection of information from healthcare professionals regarding malaria prevalence, causes, and health effects among children.

The study was conducted in Omu-Ijebu, Ogun State, Nigeria. The area experiences a tropical climate characterized by high rainfall, warm temperatures, and environmental conditions favorable for mosquito breeding.

The target population comprised nurses, physicians, and community health workers working in selected healthcare facilities within the study area. A purposive sampling technique was used to select fifty respondents with direct professional involvement in malaria diagnosis and management.

Data were collected using a structured questionnaire containing demographic items and sections addressing malaria determinants, health effects, preventive practices, and intervention strategies. Content validity was established through expert review, while reliability was confirmed through pilot testing and Cronbach's alpha assessment. The questionnaires were administered personally by the researcher with assistance from trained research assistants. Respondents were informed about the purpose of the study and confidentiality was maintained

Data analysis involved frequencies, percentages, means, standard deviations, and chi-square statistical tests. Statistical significance was determined at $p < .05$ using SPSS version 23.

Results

Demographic Characteristics of Respondents

Table 1: Distribution of Respondents by Gender

Gender	Frequency	Percentage (%)
Male	18	36
Female	32	64
Total	**50**	**100**

The findings indicate that females constituted the majority of respondents (64%). This distribution reflects the dominance of women within nursing and community health practice in many Nigerian healthcare facilities.

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Table 2: Distribution by Professional Category

Profession	Frequency	Percentage (%)
Nurses	24	48
Doctors	10	20
Community Health Workers	16	32
Total	**50**	**100**

Nurses represented the largest professional group. Their frequent interaction with pediatric patients makes their perspectives particularly relevant to malaria management.

Major Causes of Malaria Among Children

Table 3: Perceived Determinants of Malaria Prevalence

Determinant	Frequency	Percentage (%)
Poor Environmental Sanitation	45	90
Stagnant Water Bodies	43	86
Poor Drainage Systems	40	80
Inadequate Use of ITNs	38	76
Bushy Environment	35	70
Poor Housing Conditions	30	60
Poverty	28	56

Environmental sanitation emerged as the strongest determinant. Ninety percent of respondents agreed that poor sanitation significantly contributes to malaria prevalence among children.

Awareness and Utilization of Preventive Measures

Table 4: Use of Insecticide-Treated Nets

Response	Frequency	Percentage (%)
Consistent Use	20	40
Occasional Use	18	36
No Use	12	24

Although awareness was generally high, only 40% reported consistent utilization of ITNs.

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Figure 1: Percentage Utilization of ITNs

Table 5
Major Health Effects Among Children

Effect	Frequency	Percentage (%)
Fever and Weakness	48	96
Anemia	42	84
School Absenteeism	40	80
Loss of Appetite	38	76
Poor Academic Performance	35	70
Convulsions	20	40
Mortality in Severe Cases	18	36

The findings demonstrate that malaria significantly affects both physical health and educational outcomes.

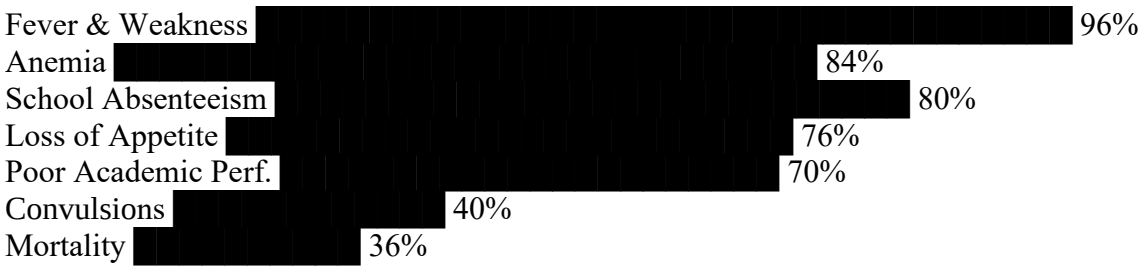

Figure 2: Major Health Effects of Malaria

Discussion of Findings

The findings of this study revealed that poor environmental sanitation was the most significant determinant of malaria prevalence among children in Omu-Ijebu. This finding agrees with previous studies conducted by Hay et al. (2010), Adekunle et al. (2024), and Chiziba et al. (2024), which identified poor sanitation and stagnant water as major contributors to malaria transmission. The study further found that inadequate utilization of insecticide-treated nets contributes significantly to malaria prevalence. This observation supports the findings of Oresanya et al. (2011), Afolabi et al. (2015), and Yusuf and Lawal (2024), who reported that inconsistent use of mosquito nets remains a major challenge in malaria control efforts.

The high prevalence of anemia among children observed in this study is consistent with reports by White et al. (2014), WHO (2023), and WHO (2024), which identified anemia as one of the most common complications of malaria infection. Malaria-induced anemia remains a major cause of childhood hospitalization and mortality across sub-Saharan Africa.

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Similarly, the findings regarding school absenteeism and poor academic performance support previous studies by Okonkwo et al. (2023) and Zhang et al. (2022), which demonstrated that recurrent malaria infections negatively affect educational outcomes and cognitive development among children.

The significant relationship between environmental sanitation and malaria prevalence confirms the importance of environmental management as a key malaria control strategy. This finding aligns with recommendations contained in the National Malaria Strategic Plan (FMOH, 2021) and WHO malaria control guidelines (WHO, 2015).

Overall, the findings reinforce evidence from previous studies indicating that effective malaria control requires integrated interventions involving environmental sanitation, healthcare access, community education, ITN utilization, prompt treatment, and sustained governmental support (WHO, 2024; UNICEF, 2024; National Malaria Elimination Programme, 2023).

Conclusion

This study investigated the causes and effects of malaria among children in Omu-Ijebu, Ogun State. Findings revealed that malaria remains a significant public health challenge among children despite ongoing awareness efforts.

Malaria remains a major public health challenge among children in Omu-Ijebu, Ogun State, Nigeria. Environmental sanitation deficiencies, stagnant water accumulation, inadequate utilization of insecticide-treated nets, poor drainage infrastructure, and poverty continue to drive malaria transmission.

The study further established that malaria negatively affects children's health through anemia, weakness, malnutrition, school absenteeism, poor cognitive performance, and increased mortality. Statistical evidence demonstrated significant relationships between environmental sanitation and malaria prevalence as well as between malaria infection and child health outcomes.

Effective malaria control therefore requires integrated approaches involving environmental management, improved healthcare access, community education, and strengthened public health interventions.

Recommendations

Based on the findings of the study, the following recommendations were made:

- Government and public health agencies should intensify environmental sanitation campaigns to eliminate mosquito breeding sites.
- Insecticide-treated bed nets should be distributed freely or subsidized for vulnerable households.
- Community health education programs should be strengthened to promote proper malaria prevention practices.
- Drainage systems should be improved to prevent water stagnation.
- Healthcare facilities should be adequately equipped for prompt diagnosis and treatment of malaria.
- Schools should implement malaria awareness programs for pupils and parents.
- Government should increase funding for malaria research and control programs.

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- Community participation should be encouraged in environmental sanitation activities. The findings have important implications for public health policy in Nigeria.
- First, local governments should prioritize environmental sanitation initiatives as a core malaria-control strategy. Routine clearing of drainage systems and waste management programmes should be strengthened.
- Second, malaria prevention programmes should incorporate behavioral-change communication strategies capable of improving consistent ITN utilization among caregivers.
- Third, schools should be integrated into malaria control programmes through health education and awareness campaigns.
- Fourth, primary healthcare centres should receive increased funding to strengthen malaria diagnosis, treatment, and surveillance activities.
- Fifth, implementation of the RTS,S and R21 malaria vaccines should be expanded to vulnerable populations in rural and semi-urban communities.

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