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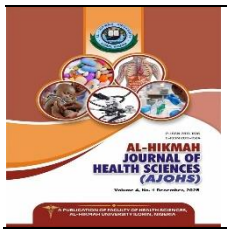

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Original Article

Impact of Environmental Health on the Prevalence of Malaria in Ilorin Metropolis, Kwara State, Nigeria

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ABSTRACT

Background: Environmental health plays a critical role in the transmission dynamics of malaria. Factors such as poor waste management, inadequate drainage systems, and the presence of stagnant water bodies create ideal breeding grounds for mosquitoes, thereby increasing the risk of malaria transmission. This study examines the impact of environmental health on the prevalence of malaria in Ilorin metropolis, Kwara State, Nigeria.

Methods: This study adopted a survey research design. The study population comprised of all sample of residents in Ilorin Metropolis, Kwara State, Nigeria. Using Cochran's formula, a total of 250 respondents were selected using the multistage sampling techniques, was used for this study. Data collected was analysed statistically using descriptive and inferential statistics.

Results: The study revealed a high malaria prevalence (78.56%) in Ilorin Metropolis, linked to poor drainage, waste disposal, sanitation, and water quality. Housing quality, sanitation practices, waste management, access to clean water, and vector control were found to significantly impact malaria prevalence, with most homes moderately built and residents practicing effective waste and vector control measures.

Conclusion: The study concluded that improving environmental health conditions, particularly waste management, sanitation, housing quality, and water supply, is crucial in controlling malaria in Ilorin Metropolis.

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Introduction

Malaria remains one of the most significant public health challenges globally, particularly in sub-Saharan Africa. It is caused by Plasmodium parasites transmitted through the bites of infected female Anopheles mosquitoes, with *P. falciparum* responsible for most severe cases and deaths (WHO, 2023). In 2020, malaria accounted for over 241 million cases worldwide, with Nigeria contributing about 27% of global cases and 23% of deaths, making it the most affected country (NMEP, 2021; WHO, 2022). The transmission of malaria is strongly influenced by environmental conditions that support mosquito breeding and survival. Factors such as stagnant water, poor drainage, rainfall, and high humidity provide ideal breeding grounds for Anopheles mosquitoes (Olawale et al., 2022). In Ilorin Metropolis, the tropical climate, inadequate waste management, blocked drainage systems, and improper disposal of refuse further heighten malaria transmission

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(Akinwale et al., 2021). Additionally, substandard housing with poorly screened windows and unclean surroundings allows mosquitoes easy access into homes (Chukwu et al., 2020).

Environmental health, including water quality, sanitation, housing conditions, and waste management, therefore, plays a major role in malaria prevalence (WHO, 2021). However, socioeconomic and behavioural factors also contribute significantly. Many low-income households in Ilorin lack access to clean water, sanitation facilities, and malaria prevention tools such as insecticide-treated nets (Tusting et al., 2019). Practices like open water storage and indiscriminate waste dumping further increase exposure to mosquito breeding sites (Olawale et al., 2022). Despite these clear connections, research on the environmental determinants of malaria in Ilorin remains limited, with most studies focusing on clinical aspects. This gap in local evidence highlights the need to investigate how environmental health conditions influence malaria prevalence in the metropolis to inform targeted and effective control strategies.

Objectives of the Study

The study aims to examine the impact of environmental health on the prevalence of malaria in Ilorin metropolis, Kwara State, Nigeria. The specific objectives are to;

determine the prevalence of malaria in Ilorin metropolis, Kwara State, Nigeria;

Discover the current environmental health condition that predisposes to an increased incidence of malaria in Ilorin metropolis, Kwara State, Nigeria;

Identify the factors that influence environmental health in Ilorin metropolis, Kwara State, Nigeria; and

Methodology

Study Design and Setting

This study adopted a survey research design to investigate the impact of environmental health on the prevalence of malaria in Ilorin Metropolis, Kwara State, Nigeria.

Study Population and Sampling

The study population comprised all residents of Ilorin Metropolis, estimated at 1.4 million. A sample size of 250 respondents was determined using Cochran's formula at a 95% confidence level and 5% margin of error, including allowance for non-response. A multistage sampling technique was employed. First, Ilorin West LGA was purposively selected. Second, three wards were chosen through simple random sampling. Third, two communities were selected from each ward, making six communities. Fourth, 20 households were systematically selected in each community. Finally, two eligible residents were randomly selected from each household.

Data Collection Instrument

A researcher-designed questionnaire containing variables related to environmental health and malaria served as the instrument for data collection.

Validity and Reliability of the Instrument

The questionnaire was pre-tested on 30 respondents to ensure clarity, validity, and reliability.

Data Collection Procedure and Ethical Considerations

The researcher personally administered the questionnaires after obtaining ethical approval from the Health Research Ethics Committee of Al-Hikmah University. Respondents were assured of confidentiality and voluntary participation. Ethical considerations and confidentiality were strictly upheld throughout the study.

Data Analysis

Collected data were coded and analysed using SPSS version 23. Mean score was used to answer the research questions.

Results

Research Question One: What is the prevalence of malaria in Ilorin Metropolis, Kwara State, Nigeria?

Table 1: Prevalence of Malaria in Ilorin Metropolis, Kwara State, Nigeria

S/N	ITEMS	SA	A	D	SD	X
1	Malaria is a common health issue in my household.	28	176	39	07	3.68
2	I or a member of my household has been diagnosed with malaria in the past year.	26	180	42	02	4.06
3	The frequency of malaria cases in my community is high.	59	143	43	05	3.62
4	Malaria symptoms are often observed in my area.	50	138	49	13	3.55
5	The occurrence of malaria has increased in recent years in Ilorin metropolis.	42	140	54	14	3.58

From Table 1, it was observed that all the mean of the items are higher than 2.5 and are therefore interpreted to mean that majority of the respondents agreed that there is high (78.56%) prevalence of malaria in Ilorin Metropolis, Kwara State, Nigeria.

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Research Question Two: What is the current environmental health condition that predisposes to an increased incidence of malaria in Ilorin metropolis, Kwara State, Nigeria?

Table 2: Current Environmental Health Conditions that Predispose to Increase Incidence of Malaria in Ilorin Metropolis, Kwara State, Nigeria

S/N	ITEMS	SA	A	D	SD	X
1	Poor drainage systems in my area contribute to stagnant water.	30	165	44	11	3.66
2	The presence of open refuse dumps in my community contributes to mosquito breeding.	32	147	61	10	3.57
3	The sanitation practices in my neighborhood are inadequate.	40	130	62	18	3.41
4	The water supply in my community is often contaminated.	49	141	43	17	3.52
5	The lack of proper waste disposal increases the risk of malaria in my area.	40	130	62	18	3.43

Table 2 explained that all the mean of the items is higher than 2.5 and are therefore interpreted to mean that majority of the respondents agreed that among the current environmental health condition that predisposes to increase incidence of Malaria in Ilorin Metropolis, Kwara State, Nigeria include, poor drainage systems, presence of open refuse dumps, inadequate sanitation practices, contaminated water supply and lack of proper waste disposal.

Research Question Three: What are the factors that influence environmental health in Ilorin metropolis, Kwara State, Nigeria?

Table 3: Factors that Influence Environmental Health in Ilorin Metropolis, Kwara State, Nigeria

S/N	ITEMS	SA	A	D	SD	X
1	The quality of housing in my area affects our exposure to mosquitoes.	56	103	71	20	3.14
2	Access to clean water is a challenge in my community.	50	124	62	14	3.40
3	Waste management practices in my area are effective.	40	152	39	19	3.57
4	Sanitation facilities in my community are well-maintained.	48	138	47	17	3.45
5	The effectiveness of vector control measures (e.g., insecticide-treated nets, spraying) is high in my area.	49	136	54	11	3.42

From Table 3, it was revealed that all the mean of the items is higher than 2.5 and are therefore interpreted to mean that majority of the respondents agreed that among the factors that influence environmental health in Ilorin Metropolis, Kwara State, Nigeria are; housing quality; access to clean water; effective waste management practices; well-maintained sanitation facilities; and effectiveness of vector control measures.

Discussion

The study revealed a high malaria prevalence of 78.56% in Ilorin Metropolis, Kwara State, Nigeria. This is consistent with other findings in regions of Nigeria with similar environmental conditions. For instance, a study by Aina et al. (2020) found malaria prevalence rates ranging from 70% to 80% in urban areas where environmental degradation and poor sanitation were prevalent. This high prevalence can be linked to the subtropical climate, which favors mosquito breeding. In contrast, studies in well-planned urban centers with better environmental conditions, such as Lagos, reported significantly lower malaria prevalence rates of 30% to 40% (Onyido et al., 2019). This suggests that the environmental health conditions in Ilorin might contribute significantly to the high prevalence of malaria.

The study identified poor drainage systems, open refuse dumps, inadequate sanitation, contaminated water, and poor waste disposal as major contributors to the high incidence of malaria in Ilorin Metropolis, Kwara State, Nigeria. These findings align with Okafor and Okochi's (2018) research, which highlighted that inadequate sanitation and open refuse dumps create ideal breeding grounds for mosquitoes. Similarly, Adebayo et al. (2020) pointed out that poor drainage systems, especially in densely populated urban areas, often lead to stagnant water, promoting mosquito breeding. In contrast, regions with better waste management and effective drainage systems, such as Abuja, report lower malaria incidences (Yakubu et al., 2021). This comparison reinforces the idea that addressing environmental health issues is key to reducing malaria rates in Ilorin.

The study highlighted housing quality, access to clean water, effective waste management, proper sanitation,

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and vector control as key factors influencing environmental health in Ilorin Metropolis, Kwara State, Nigeria. This is corroborated by Ojo et al. (2021), who found that poor housing and inadequate access to clean water were significant predictors of environmental health and malaria incidence. Similarly, Yakubu et al. (2019) identified the effectiveness of vector control measures, such as the use of insecticide-treated nets (ITNs) and indoor residual spraying, as essential in reducing malaria prevalence. However, in contrast to these findings, a study by Adekunle et al. (2020) in rural areas indicated that cultural practices and lack of awareness about proper sanitation practices also significantly affect environmental health, a factor that may be less prominent in Ilorin's urban setting.

Additionally, the study noted that 68% of residents in Ilorin metropolis practice proper waste management, contributing to reduced mosquito breeding sites. This is comparable to findings by Aina et al. (2020) in urban areas where good waste management practices significantly reduced malaria incidences. However, studies from peri-urban areas with inadequate waste management, like in Akure (Ogunleye et al., 2020), reported higher rates of malaria due to the proliferation of waste dumps that serve as mosquito breeding grounds. This study reported that 64.4% of Ilorin residents have access to good quality water. This is important, as Onyido et al. (2019) indicated that contaminated water can serve as breeding grounds for mosquitoes. Lastly, this study revealed that the use of mosquito nets and insecticides rate was 62%. This reflects the findings of Okonofua and Akintunde (2020), who noted that in areas where such preventive measures are widely used, malaria incidence is significantly reduced.

Conclusion

Malaria remains highly prevalent, with 78.56% of residents affected. Key environmental health factors contributing to this high incidence include poor drainage systems, open refuse dumps, inadequate sanitation practices, contaminated water supply, and improper waste disposal. These conditions create ideal breeding grounds for mosquitoes, which increase malaria transmission. Overall, improving environmental health conditions, particularly waste management, sanitation, housing quality, and water supply, is crucial to controlling malaria in Ilorin Metropolis. Addressing these factors through targeted interventions can help reduce the malaria burden and improve public health in the area.

Recommendations

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

The government should improve drainage systems across Ilorin Metropolis to prevent stagnant water, which serves as breeding grounds for mosquitoes.

The community should actively participate in environmental sanitation efforts by organizing regular clean-up activities to eliminate mosquito breeding sites.

Individuals should use insecticide-treated mosquito nets and insect repellents consistently, especially at night, to protect against mosquito bites.

Health workers should educate the public on the importance of environmental hygiene in preventing malaria and demonstrate proper sanitation practices.

Conflict of Interest

The authors declare no conflict of interest.

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