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Epidemiological Assessment of Malaria Prevention Practices and Socio-Demographic Correlates among Urban Residents of Oshodi-Isolo Local Government Area, Lagos State, Nigeria

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Abstract: Background: Malaria remains a major public health challenge in sub-Saharan Africa, particularly in Nigeria, where transmission is sustained by environmental and behavioural factors despite ongoing control interventions.
Objective: This study assessed malaria prevention practices and socio-demographic correlates among urban residents of Oshodi-Isolo Local Government Area, Lagos State, Nigeria.
Methods: A community-based cross-sectional study was conducted among 250 respondents selected from Oshodi-Isolo LGA. Data were collected using a structured questionnaire covering socio-demographic characteristics, knowledge, attitudes, practices, and environmental risk factors. Data were analysed using descriptive statistics and Pearson correlation at a 5% level of significance.
Results: Most respondents were female (60.0%) and aged 18–25 years (30.0%). While 64.0% had heard of malaria and 68.0% were aware of insecticide-treated nets, misconceptions about transmission persisted. Although 86.0% had positive attitudes toward malaria prevention, 83.3% demonstrated poor preventive practices. Environmental risk factors such as stagnant water (66.0%), poor drainage (68.8%), and frequent mosquito presence (72.0%) were common. Significant correlations were observed between knowledge and attitude ($r = -0.783$, $p < 0.05$), knowledge and practice ($r = 0.469$, $p < 0.05$), and attitude and practice ($r = -0.301$, $p < 0.05$).
Conclusion: Despite relatively good awareness and positive attitudes, malaria prevention practices remain inadequate among urban residents. Sustainable behavioural change communication, improved environmental management, and strengthened community-level malaria prevention interventions are required to reduce transmission in the study area.

Keywords: Malaria, prevention practices, socio-demographic factors, KAP, Lagos, Nigeria.

INTRODUCTION

Malaria is a life-threatening infectious disease caused by parasites of the *Plasmodium* genus and transmitted to humans through the bites of infected female *Anopheles* mosquitoes. It remains one of the most important public health challenges worldwide, particularly in sub-Saharan Africa, where it continues to account for high levels of illness and death. The World Health Organization (WHO) estimated that malaria was responsible for about 627,000 deaths in 2020, reflecting its persistent global burden and the need for strengthened prevention and control efforts.

Human malaria is caused by five main species of *Plasmodium*, namely *Plasmodium falciparum*, *P. vivax*, *P. ovale*, *P. malariae*, and *P. knowlesi* [1]. Among these, *P. falciparum* is the most severe and is responsible for the majority of malaria-related deaths, especially in Africa, which carries over 90% of the global mortality burden. The transmission of malaria is strongly influenced by environmental conditions such as rainfall patterns, temperature, humidity, and the presence of stagnant water, which support mosquito breeding, particularly in tropical and subtropical regions. Although significant progress has been made globally in malaria control, the disease remains endemic in many countries, including Nigeria, which continues to rank among the highest contributors to global malaria cases. In many urban and semi-urban settings, factors such as overcrowding, poor sanitation, and inadequate drainage systems create favourable environments for mosquito proliferation, thereby sustaining transmission.

Several preventive strategies have been introduced to reduce malaria transmission, including the use of insecticide-treated bed nets (ITNs), indoor residual spraying (IRS), environmental sanitation, and chemoprophylaxis [2]. When properly adopted, these interventions have been shown to significantly reduce malaria incidence and mortality (Noor et al., 2016). However, the level of utilization of these preventive measures varies considerably among different population groups.

Evidence from previous studies indicates that socio-demographic factors such as age, gender, level of education, income status, occupation, and cultural beliefs significantly influence malaria prevention practices [3]. Individuals with higher educational attainment and better economic status are generally more likely to adopt effective preventive behaviours, while poverty, limited awareness, and cultural misconceptions often hinder the use of malaria prevention tools among disadvantaged populations.

Malaria is widely recognized as a disease closely linked to poverty, disproportionately affecting vulnerable groups such as children under five years, pregnant women, and low-income households. This relationship creates a vicious cycle in which malaria contributes to poverty through reduced productivity, increased healthcare costs, and loss of income, while poverty in turn increases vulnerability to infection [4].

Despite global initiatives such as the WHO Global Technical Strategy for Malaria (2016–2030) and the introduction of malaria vaccines like RTS,S and R21, challenges such as inconsistent use of preventive measures, insecticide resistance, and gaps in health education continue to hinder malaria control efforts in many endemic regions.

Against this backdrop, it becomes essential to examine how socio-demographic characteristics influence malaria prevention practices within specific communities. This study therefore assesses malaria prevention practices and socio-demographic correlates among urban residents in Oshodi-Isolo Local Government Area, Lagos State, Nigeria.

METHODS

Study Design

This study employed a community-based descriptive cross-sectional research design to assess malaria prevention practices and socio-demographic correlates among urban residents of Oshodi-Isolo Local Government Area, Lagos State, Nigeria. The cross-sectional design was considered appropriate because it enabled the collection of data from participants at a single point in time and facilitated the examination of relationships between socio-demographic characteristics and malaria prevention practices.

Study Area

The study was conducted in Oshodi-Isolo Local Government Area (LGA) of Lagos State, Nigeria. Oshodi-Isolo is one of the metropolitan LGAs in Lagos State and is characterized by high population density, rapid urbanization, commercial activities, and mixed residential settlements. The area experiences environmental challenges such as poor drainage systems, overcrowding, and inadequate waste management, which contribute to favourable breeding conditions for mosquitoes and increase the risk of malaria transmission. The LGA comprises several wards and communities with diverse socio-economic characteristics, including traders, artisans, civil servants, transport workers, and individuals engaged in informal economic activities. Healthcare services are provided through public primary healthcare centres, private hospitals, and community-based health facilities.

Study Population

The study population consisted of adult residents of Oshodi-Isolo Local Government Area aged 18 years and above who had resided in the area for at least six months prior to the study. Both male and female residents were included in the study.

Sample Size and Sampling Technique

A total sample size of 250 respondents was used for this study. The sample size was considered adequate to provide reliable information on malaria prevention practices and socio-demographic correlates among urban residents in Oshodi-Isolo Local Government Area, Lagos State.

A multistage sampling technique was employed in selecting participants for the study. In the first stage, selected wards within Oshodi-Isolo Local Government Area were chosen using simple random sampling techniques. In the second stage, streets and residential communities within the selected wards were randomly selected. Subsequently, households within the selected communities were chosen through systematic sampling procedures. Where more than one eligible respondent was present in a household, one participant was selected through simple random sampling.

Only adult residents aged 18 years and above who had resided in the study area for at least six months and consented to participate were included in the study. This sampling approach ensured fair representation of residents across different socio-demographic groups within the Local Government Area

Instrument for Data Collection

Data were collected using a structured interviewer-administered questionnaire adapted from relevant literature and previous studies on malaria prevention practices. The questionnaire was designed to obtain information on respondents' socio-demographic characteristics, knowledge of malaria transmission and prevention, attitudes toward malaria prevention, and malaria prevention practices, including environmental factors associated with malaria transmission. The instrument was prepared in English language and interpreted in local languages where necessary to enhance respondents' comprehension and ensure accuracy of responses during data collection. A pre-test of the questionnaire

was conducted among residents in a neighbouring Local Government Area outside the study setting. Data obtained from the pilot study were analyzed using Cronbach's alpha reliability test to assess internal consistency. A reliability coefficient of 0.70 or higher was considered acceptable for the study.

Method of Data Collection

Data collection was conducted by trained research assistants under the supervision of the researcher. Prior to questionnaire administration, respondents were informed about the objectives and relevance of the study, and written informed consent was obtained from all participants. The questionnaires were administered through face-to-face interviews to ensure clarity and completeness of responses. Confidentiality and anonymity of participants' information were strictly maintained throughout the study.

Data Analysis

Completed questionnaires were carefully reviewed for completeness and consistency prior to data entry. Data obtained from the study were coded and entered into the Statistical Package for Social Sciences (SPSS) version 25.0 for analysis. Descriptive statistical methods, including frequencies, percentages, means, and standard deviations, were used to summarize respondents' socio-demographic characteristics and malaria prevention practices. Inferential statistical analyses, including Chi-square tests and logistic regression analysis, were performed to determine associations between socio-demographic factors and malaria prevention practices. Statistical significance was established at a p-value of less than 0.05.

Ethical Considerations

Ethical approval for the study was obtained from the appropriate Health Research Ethics Committee prior to the commencement of data collection. Permission to conduct the study was also obtained from relevant authorities within Oshodi-Isolo Local Government Area, Lagos State.

Participation in the study was entirely voluntary, and informed consent was obtained from all respondents before their inclusion in the study. Participants were assured of the confidentiality and anonymity of all information provided, and they were informed of their right to withdraw from the study at any stage without penalty or consequences. All data collected were used strictly for academic and research purposes.

RESULTS

Table 1: Socio-Demographic Characteristics of Respondents (n = 250)

Characteristics	Category	Frequency (n=250)	Percentage (%)
Age (years)	18–25	75	30.0
	26–35	65	26.0
	36–45	60	24.0
	46–55	50	20.0

Characteristics	Category	Frequency (n=250)	Percentage (%)
Gender	Male	100	40.0
	Female	150	60.0
Marital Status	Single	95	38.0
	Married	140	56.0
	Divorced	15	6.0
Religion	Christianity	110	44.0
	Islam	130	52.0
	Others	10	4.0
Occupation	Employed	60	24.0
	Self-employed	95	38.0
	Student	75	30.0
	Unemployed	20	8.0
Level of Education	No Formal Education	40	16.0
	SSCE	85	34.0
	ND/NCE	70	28.0
	HND/B.Sc.	55	22.0

The socio-demographic distribution of respondents is presented in Table 1. The age distribution showed that the highest proportion of respondents were within the 18–25 years age group (30.0%), followed by 26–35 years (26.0%), 36–45 years (24.0%), while the least were within 46–55 years (20.0%). This indicates a relatively young study population. In terms of gender, females constituted a higher proportion (60.0%) compared to males (40.0%). Regarding marital status, more than half of the respondents were married (56.0%), while 38.0% were single and 6.0% were divorced.Religious

affiliation revealed that most respondents were Muslims (52.0%), followed by Christians (44.0%), and a small proportion belonging to other religions (4.0%) [5]. Occupational distribution showed that self-employed respondents constituted the largest group (38.0%), followed by students (30.0%), employed individuals (24.0%), and unemployed respondents (8.0%). Educational attainment indicated that a significant proportion had secondary education (SSCE) (34.0%), followed by ND/NCE holders (28.0%), HND/B.Sc. holders (22.0%), while 16.0% had no formal education. Overall, the findings reflect a moderately educated, economically diverse urban population.

Table 2: Knowledge and Awareness of Malaria among Respondents (n = 250)

Knowledge Indicators	**Response**	**Frequency (n=250)**	**Percentage (%)**
Ever heard of malaria	Yes	160	64.0
	No	90	36.0
Perceived cause of malaria	Mosquito bites	150	60.0
	Contaminated food	15	6.0
	Dirty water	75	30.0
	Don’t know	10	4.0
Awareness of insecticide-treated nets (ITNs)	Yes	170	68.0
	No	80	32.0
Knowledge that stagnant water breeds mosquitoes	Yes	140	56.0
	No	110	44.0
Perception that malaria can be fatal	Yes	120	48.0
	No	130	52.0

Knowledge of Malaria Signs and Symptoms

Symptoms Identified	Response	Frequency (n=250)	Percentage (%)
High temperature (fever)	Yes	140	56.0
Vomiting	Yes	120	48.0
Sweating	Yes	95	38.0
Headache	Yes	150	60.0

Findings on knowledge and awareness of malaria are presented in Table 2. A total of 64.0% of respondents had heard of malaria, while 36.0% had not. Regarding perceived causes, 60.0% correctly identified mosquito bites as the cause of malaria, while misconceptions were observed among respondents who attributed malaria to dirty water (30.0%), contaminated food (6.0%), and those who did not know (4.0%) [6]. Awareness of insecticide-treated nets (ITNs) was reported by 68.0% of respondents. Slightly more than half (56.0%) were aware that stagnant water serves as a breeding site for mosquitoes. However, only 48.0% perceived malaria as a fatal disease. In terms of symptoms, headache (60.0%) and fever (56.0%) were the most commonly identified, followed by vomiting (48.0%) and sweating (38.0%).

Table 3: Attitudes toward Malaria Prevention among Respondents (n = 250)

Attitude Statements	Response	Frequency (n=250)	Percentage (%)
Malaria can be prevented	Agree	180	72.0
	Disagree	70	28.0
Insecticide-treated nets are effective in preventing malaria	Agree	165	66.0
	Disagree	85	34.0
Sleeping under ITNs is comfortable	Agree	120	48.0
	Disagree	130	52.0
Regular environmental sanitation reduces malaria risk	Agree	190	76.0

Attitude Statements	Response	Frequency (n=250)	Percentage (%)
	Disagree	60	24.0
Indoor spraying helps reduce mosquito infestation	Agree	160	64.0
	Disagree	90	36.0
Malaria prevention is expensive	Agree	140	56.0
	Disagree	110	44.0
Traditional remedies are more effective than modern prevention methods	Agree	65	26.0
	Disagree	185	74.0

The findings on attitudes toward malaria prevention show generally positive perceptions among respondents. A majority (72.0%) agreed that malaria can be prevented, while 66.0% believed that insecticide-treated nets are effective in prevention. Most respondents (76.0%) agreed that environmental sanitation reduces malaria risk, and 64.0% supported the effectiveness of indoor spraying [7], [8]. However, only 48.0% agreed that sleeping under ITNs is comfortable, indicating a potential barrier to consistent usage. More than half (56.0%) perceived malaria prevention as expensive, while only 26.0% believed that traditional remedies are more effective than modern prevention methods.

Table 4: Malaria Prevention Practices among Respondents (n = 250)

Prevention Practices	Response	Frequency (n=250)	Percentage (%)
Use of insecticide-treated nets (ITNs)	Always	110	44.0
	Sometimes	80	32.0
	Never	60	24.0
Sleeping under ITNs every night	Yes	120	48.0
	No	130	52.0

Prevention Practices	Response	Frequency (n=250)	Percentage (%)
Regular environmental cleaning around home	Yes	170	68.0
	No	80	32.0
Use of mosquito repellents (coils/sprays)	Yes	140	56.0
	No	110	44.0
Screening windows and doors to prevent mosquitoes	Yes	150	60.0
	No	100	40.0
Indoor residual spraying in the past 12 months	Yes	95	38.0
	No	155	62.0
Seeking hospital treatment immediately when sick	Yes	180	72.0
	No	70	28.0
Self-medication before visiting hospital	Yes	130	52.0
	No	120	48.0

Table 4 presents respondents' malaria prevention practices. Less than half (44.0%) reported always using insecticide-treated nets, while 32.0% used them occasionally and 24.0% never used them. Similarly, only 48.0% reported sleeping under ITNs every night [9]. Environmental hygiene practices were relatively better, with 68.0% engaging in regular environmental cleaning and 60.0% reporting the use of window or door screening. More than half (56.0%) used mosquito repellents such as coils or sprays. However, only 38.0% reported indoor residual spraying in the past 12 months, indicating low uptake of this intervention. Health-seeking behavior was relatively good, as 72.0% sought hospital treatment immediately when ill, although 52.0% also practiced self-medication before visiting a health facility [10].

Table 5a: Distribution of Respondents' Knowledge, Attitude, and Practice (KAP) Scores (n =

150)

Variable	Category	Frequency (n=150)	Percentage (%)
Knowledge Score	Low Knowledge	82	54.7
	Average Knowledge	26	17.3
	High Knowledge	42	28.0
Attitude Score	Negative Attitude	21	14.0
	Positive Attitude	129	86.0
Practice Score	Poor Practice	125	83.3
	Good Practice	25	16.7

Table 5b: Correlation Analysis of Knowledge, Attitude, and Practice among Respondents (n = 150)

Variables	Knowledge	Attitude	Practice
Knowledge	1		
Attitude	-0.783** (p = 0.000)	1	
Practice	0.469** (p = 0.000)	-0.301** (p = 0.000)	1

Note: Correlation is significant at $p < 0.05$ (2-tailed).

The distribution of Knowledge, Attitude, and Practice (KAP) scores is presented in Table 5a. More than half of the respondents (54.7%) had low knowledge of malaria prevention, while 28.0% had high knowledge and 17.3% had average knowledge. Despite this, a large majority (86.0%) demonstrated a positive attitude toward malaria prevention. However, most respondents (83.3%) exhibited poor prevention practices [11]. The correlation analysis presented in Table 5b revealed a strong negative relationship between knowledge and attitude ($r = -0.783$, $p < 0.05$), indicating that higher knowledge did not necessarily translate to more positive attitudes in this population. A moderate positive relationship was observed between knowledge and practice ($r = 0.469$, $p < 0.05$), suggesting that increased knowledge improves preventive practices [12]. However, attitude showed a weak negative relationship with practice ($r = -0.301$, $p < 0.05$), indicating inconsistencies between attitudes and actual behavior.

Table 6: Environmental Risk Factors Associated with Malaria Transmission among Respondents (n = 250)

Environmental Factors	Response	Frequency (n=250)	Percentage (%)
Presence of stagnant water around residence	Yes	165	66.0
	No	85	34.0
Poor drainage system in the community	Yes	172	68.8
	No	78	31.2
Bushy/overgrown surroundings near home	Yes	140	56.0
	No	110	44.0
Frequent presence of mosquitoes indoors	Yes	180	72.0
	No	70	28.0
Improper waste disposal in the environment	Yes	155	62.0
	No	95	38.0
Open water containers around household	Yes	120	48.0
	No	130	52.0
Use of window/door screening	Yes	150	60.0
	No	100	40.0

The environmental risk assessment showed that a high proportion of respondents were exposed to malaria-conducive conditions. Presence of stagnant water around residences was reported by 66.0% of respondents, while 68.8% reported poor drainage systems in their communities. More than half (56.0%) indicated bushy or overgrown surroundings near their homes, and 72.0% reported frequent presence of mosquitoes indoors [13], [14], [15]. Improper waste disposal was reported by 62.0% of respondents, further contributing to mosquito breeding conditions. Additionally, 48.0% reported open water containers around households, while 60.0% had window or door screening as a protective measure.

DISCUSSION

This study assessed malaria prevention practices and socio-demographic correlates among urban residents in Oshodi-Isolo Local Government Area, Lagos State, Nigeria. The findings provide important insights into knowledge levels, attitudes, preventive practices, and environmental risk factors associated with malaria transmission in an urban setting. The socio-demographic characteristics revealed a predominantly young and female population, with most respondents engaged in self-employment and informal occupations [16]. Similar demographic patterns have been reported in previous Nigerian studies where urban populations are largely composed of economically active individuals with varying levels of education and exposure to health information [17]. Educational attainment in this study was moderate, which may have contributed to the observed variation in knowledge and preventive behaviours.

Findings on knowledge of malaria showed that although a majority of respondents had heard of malaria and correctly identified mosquito bites as its cause, misconceptions remained regarding its transmission. A notable proportion attributed malaria to contaminated food and dirty water. This aligns with earlier findings by Adebayo et al. who reported persistent misconceptions about malaria causation among rural and peri-urban populations in southwestern Nigeria. Similarly, inadequate comprehensive knowledge has been documented among different population groups in sub-Saharan Africa. Awareness of insecticide-treated nets (ITNs) was relatively high in this study, which is consistent with national malaria control efforts promoting ITN distribution. However, despite this awareness, knowledge of malaria severity was moderate, as less than half of respondents perceived malaria as a fatal di [18] sease. This finding is concerning, as perceived severity is a key determinant of preventive behaviour in health belief models [19]. The attitude of respondents toward malaria prevention was generally positive. Most participants acknowledged that malaria is preventable and that ITNs and environmental sanitation are effective control measures. This agrees with findings from Ambrose et al. who reported generally favourable attitudes toward malaria prevention among antenatal clinic attendees in Tanzania. However, comfort-related concerns regarding ITN use were identified, as nearly half of respondents reported discomfort while sleeping under nets. Similar barriers to consistent ITN use have been documented in Nigeria and other malaria-endemic regions [20], [21], [22].

Despite relatively positive attitudes, actual preventive practices were suboptimal. Less than half of respondents consistently used ITNs, and only a minority reported indoor residual spraying. This discrepancy between knowledge, attitude, and practice has been widely documented in malaria studies, where awareness does not always translate into behavioural change [23], [24]. Poor adherence to preventive measures may be influenced by convenience, perceived discomfort, and economic constraints. Environmental findings in this study revealed high exposure to malaria risk factors, including stagnant water, poor drainage systems, improper waste disposal, and frequent mosquito presence indoors [25], [26], [27]. These findings are consistent with the observations of Brooker et al, who highlighted environmental conditions as major drivers of malaria transmission in urban and semi-urban African settings. Similarly, WHO emphasized that vector breeding is strongly associated with poor environmental sanitation and stagnant water bodies.

The correlation analysis demonstrated a strong negative relationship between knowledge and attitude, and a moderate positive relationship between knowledge and practice. This suggests that while knowledge may influence preventive behaviour, it does not necessarily translate into improved

attitudes. Similar inconsistencies between knowledge and practice have been reported in malaria-related behavioural studies [28]. The weak relationship between attitude and practice further highlights the presence of structural and behavioural barriers limiting effective malaria prevention.

CONCLUSION

This study assessed malaria prevention practices and socio-demographic correlates among urban residents of Oshodi-Isolo Local Government Area, Lagos State. The findings revealed moderate levels of malaria knowledge, generally positive attitudes, but poor preventive practices among respondents. Although awareness of malaria and preventive measures such as insecticide-treated nets was relatively high, misconceptions about transmission and disease severity still persist. Environmental conditions including stagnant water, poor drainage systems, improper waste disposal, and high mosquito density were also widely reported, indicating sustained exposure to malaria transmission risks. The study further demonstrated that knowledge, attitude, and practice are significantly interrelated, although increased knowledge does not necessarily translate into improved preventive behaviour. This suggests that behavioural, environmental, and structural barriers continue to limit effective malaria control at the community level. Therefore, strengthening sustained community-based health education, improving environmental sanitation, promoting consistent use of insecticide-treated nets, and enhancing access to preventive tools and behaviour change interventions are essential to bridge the gap between awareness and practice and reduce malaria transmission in the study area.

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