



Effects of Malaria Transmission and Prevention Awareness on Infection Prevalence Among Rural Inhabitants of Ukwumango Community, Abia State, Nigeria.



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ABSTRACT

Malaria has continually posed severe threat on the health of rural residents with limited or no knowledge on the practical steps of obstructing the transmission of the parasitic disease. This study evaluates the interplay between awareness and malaria prevention among rural residents. This study examined two groups of participants, one having malaria transmission knowledge and the other with no malaria transmission knowledge designated group A and B respectively. From each participant, 2 ml of blood was taken and immediately thin and thick films were prepared and the blood films stained with 10% Giemsa for 10 minutes and examined using an oil immersion microscope. A total of 92 (42.4%) positive cases were revealed in this study, with 39 (42.4%) occurring from the malaria knowledgeable group and 53 (57.6 %) cases were reported among participants in group B, ignorant of malaria transmission method. In group A, 13 (33.0%) males and 26 (67.0 %) females were infected. Group B had 22 (41.5 %) males and 31 (58.5 %) females infected respectively. There was a high malaria infectivity (84.1%) in group B compare to the infectivity rate as seen in group A. Evidence on malaria awareness in this study suggests that enlightenment on malaria pattern of transmission and prevention enable the individuals to avoid attitude considered risk of the disease. In situation where exposure is inevitable, the knowledgeable adopt the fastest means possible to stay safe by means of preventive diagnosis and treatment against manifestation of symptoms.

Keywords:

Awareness,
Community,
Malaria,
Prevention,
Ukwumango

INTRODUCTION

Nigeria has made tremendous effort in the fight for malaria prevention and control. However, Malaria has continually posed a severe health challenge in the country particularly in the rural communities. The disease has consistently inflicted burden on the populace, and has led to death in severe cases. Malaria is reportedly the principal source of regularly occurring death among children and pregnant women in rural communities of Nigeria (Adeniyi, 2023; Sarma et al., 2019; Godwin et al., 2018; Mogaji et al., 2018; Ubiaru et al., 2018). Its death toll surpasses others including death from diseases in the category of neglected tropical disease (Ezenwaka and Ekine, 2025; Adeniyi, 2023; Erine & Bada, 2023; Nku et al., 2023). Over 40% of world malaria death are reportedly occurring in Nigeria (Ikegbunam et al., 2022; WHO, 2022 Yeda et al., 2022). Akinseye et al. (2024) and Tesfay et al. (2019) reported that malaria is the most common cause of outdoor patient visit of all age and categories in Nigeria, and constitute the leading cause of morbidity and mortality in all parts of the country.

The malaria disease can slow down returns attainable through education and other valuables endeavours due to the infection (Erine and Bada, 2023; Ubiaru et al., 2018; Egbom, et al., 2021).

Malaria is a sensitive infection which occur by means of mosquito bite, particularly the female anopheles mosquito. This anopheles species transmits a *Protozoan* of the genus *Plasmodium* capable of attacking animal host with malaria. Four species of the *Plasmodium* genus have been reported having direct involvement in human malaria disease (Nku et al., 2023; Arora and Arora, 2012) which are *Plasmodium falciparum*, *Plasmodium vivax*, *Plasmodium malriae*, and *Plasmodium ovale* occurring most commonly in the shores of African including Nigeria (Nku et al., 2023; WHO, 2022; Arora and Arora, 2012). Godwin et al. (2018) reported that the most serious malaria infection reported among human in Nigeria are caused by *Plasmodium falciparum* and *Plasmodium vivax*. However, Ubiaru et al. (2018) and Oladosu and Adeniyi (2023) reports that *Plasmodium falciparum* is the common species in Nigeria responsible

for over 80% of malaria infection reported in the Country and *Plasmodium ovale*, *Plasmodium malariae* having insignificant contribution in malaria cases within Nigeria and *Plasmodium vivax* not endemic.

The rural inhabitants are the most likely of the commonest victims of malaria disease as majority of the individuals in the rural setting are devoid of the basic knowledge on malaria transmission strategy, its predisposing factors and risk behaviours. Considering that a greater number of malaria victims may have no idea on how the disease is transmitted and disperse; nor have knowledge on how to avoid the infection, breaking the yolk of malaria in our rural communities is entirely challenging. Therefore, assessing malaria prevalence as it relates to disease awareness will inform society on the actual incidence in the community and can awaken consciousness on the necessity to explore new options in achieving tangible prevention and control for the life threatening parasitic disease. It will inform rural communities of the need to absolutely put into practice behaviours that can impair vector propagation and keep the community safe and reduce disease implicated treatment like financial burden and related death. Godwin *et al.* (2018) reports that all rural communities in Nigeria are malaria endemic and severe transmission have been noticed across all states not excluding the federal capital territory. According to Mogaji *et al.* (2018) malaria has proven obstinately a public health threat in Nigeria and have severely impacted on the rural inhabitants with no knowledge about its transmission process.

Malaria disease could be preventable by individuals and community concerned effort through prioritizing environmental sanitation, adequate use of insecticides treated nets and early diagnosis and interventions (Ayanbamiji *et al.*, 2024; Eleazar *et al.*, 2022; Dambach *et al.*, 2019). These measures can only be exhibited by individuals with adequate orientation on malaria occurrence and prevention, which are lacking in many rural communities. Therefore, this study investigates the influence of malaria knowledge on the prevalence of the parasitic infection in rural community of Ukwumango village, Abia State, Nigeria.

MATERIALS AND METHODS

Study Area

This study was conducted at the Embassy hospital and Laboratories in Ukwumango community Aba north Local Government Area, Abia State. The study area, Ukwumango is a village-semi urban setting 18 kilometres away from Ariaria international market, Aba. The area experience two seasons yearly which are the rainy and dry seasons. The area is a fast-growing settlement with influx of people coming in for commercial purposes with a GPS coordinate of 5° 6' 55''N, 7° 20' 3''E.

Participants Designation

The study participants were inhabitants of Ukwumango community who on oral approach consent to carry out malaria screening at the Embassy hospital and Laboratories for the purpose of this study. The study examined individuals of all ages and gender. Demographic information of the participants was taken. Oral interview was also conducted on the participants to test their knowledge on malaria transmission pattern, prevention and control technique. Based on the malaria awareness information provided by each participant, the participants were grouped into two groups designated A and B with A representing participants knowledgeable on malaria transmission and basic preventive measures. Group B was participant devoid of knowledge on malaria transmission and preventive measures. The study was carried out between November, 2024 through May, 2025 and surveyed a total of 217 participants including infant, children, young adult and adult.

Ethical clearance

Ethical clearance for this study was given by the ethical committee of the Embassy hospital and Laboratories on approval of the topic by the Departmental Board, Biology Department Federal University Otuoke.

Sample Collection

Blood samples were collected from the participants who on oral approach agree and carry out malaria screening at the Embassy hospital and Laboratories for the purpose of this study. At the same time, basic demographic parameters for each participant were also taken. Blood was collected by pricking the finger using a sterile disposable. Immediately after blood collection, a thin film was spread on the grease-free, frosted-end adequately labelled slide using a smooth-edged slide spreader. A thick film was also prepared and allowed to dry. The films were then fixed with methanol. The blood films were stained with 10% Giemsa for 10 minutes. After which the blood film was examined using an oil immersion microscope objective (100×), and the result recorded against each participant. The films were recorded negative when at x100 objective view show no evidence of parasite. The plus sign (+) used to indicate positive slides. However, parasitaemia level was shown using the plus sign also as seen in Abebe *et al.* (2024). This laboratory procedure was aided by the laboratory technicians of the Embassy hospital and Laboratories.

Data Analysis

Data in this study was analysed using Statistical package for Social Science version 25. Data presented in tables and charts using simple percentages and the interplay between malaria awareness and malaria prevalence was test at 95% confidence level. Malaria infective rate was

calculated using the expression: $\text{Number of positive samples} / \text{Total population sampled} \times 100$ ($n/N \times 100$).

RESULTS AND DISCUSSION

A total of 217 residents of Ukwumango community were examined for malaria prevalence as it relates to their knowledge about the transmission and prevention

strategies for the disease and reported 92 (42.4%) positive cases. Among the 92 cases reported, 39 (42.4) were reported from group A (people that are knowledgeable about transmission technique and prevention methods for malaria) and 53 (57.6 %) cases were seen in group B (people with no awareness about malaria transmission and prevention strategies).

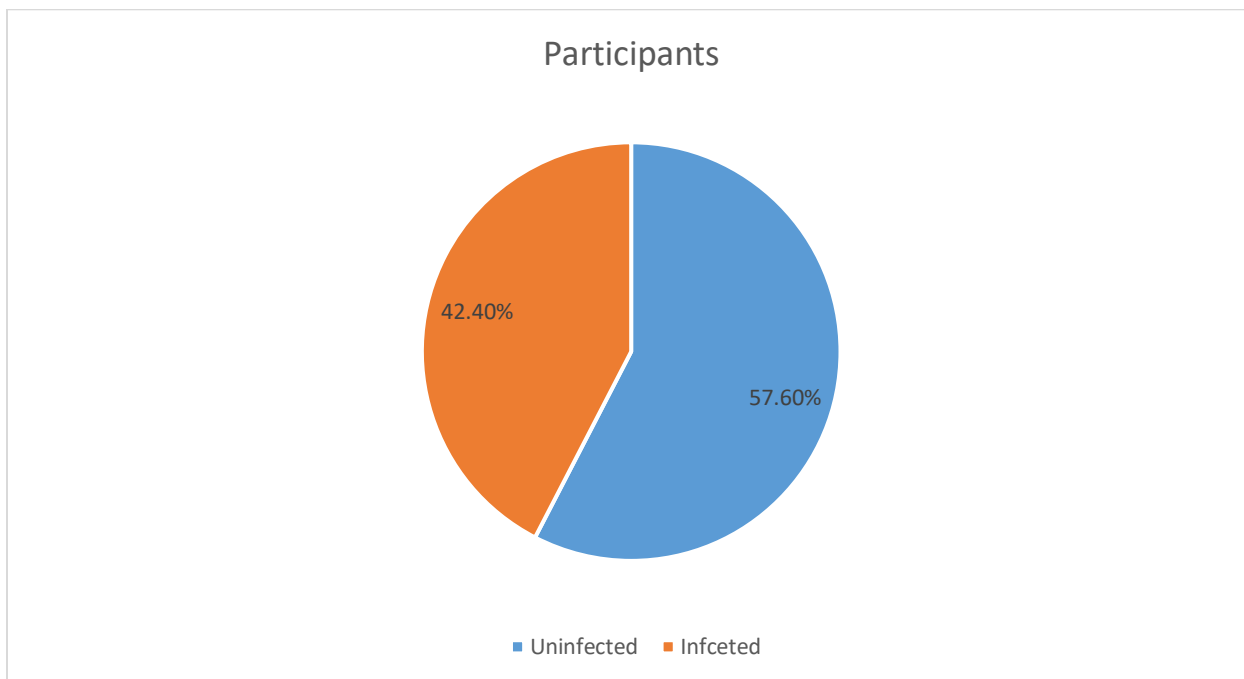


Figure 1: Malaria prevalence in Ukwumango community

Table 1: Prevalence in relation to malaria transmission and prevention Knowledge in Ukwumango community

	Group A (%)	Group B (%)	Total
Examined	154 (71.0)	63 (25.3)	217
Infected	39 (25.3)	53 (84.1)	92 (42.4%)

NB: A – participant with malaria transmission and prevention knowledge

Table 2: Gender related prevalence and Malaria Knowledge in Ukwumango community

Gender	Group A (%)	Infected (%)	Group B (%)	Infected (%)	Total infected (%)
Male	48 (31.2)	13 (33.0)	25 (39.7)	22 (41.5)	35 (38.0)
Female	106 (68.8)	26 (67.0)	38 (61.9)	31 (58.5)	57 (62.0)
Total	154 (100)	39 (25.3)	63 (29.0)	53 (84.1)	92 100

NB: A – participant with malaria transmission and prevention knowledge

B - participant with no knowledge on malaria transmission and prevention

B - participant with no knowledge on malaria transmission and prevention

Among the 217 individuals subjected to malaria examination in this study, 73 were males with infective rate of 35 (38.0 %) and 144 were females having 57 (62.0 %) positive cases respectively. In group A, 13 (33.0%) males and 26 (67.0 %) females were infected. Group B had 22 (41.5 %) males and 31 (58.5 %) females infected respectively.

Malaria prevalence in relation to age

The participants in this study were grouped into four categories based on age. These categories were A, B, C and D comprising of participants of the age range of 0-5

years, 6-14 years, 19-40 years and above 40 years old. Malaria prevalence as against age group was shown to be 4 (4.3%), 14 (15.2 %), 54 (58.7 %) and 20 (12.7 %) for people between the ages of 0-5 years, 6-18 years, 19-40 years and above 40 years old respectively.

Table 3: Malaria prevalence in relation to age

Age Range	No examined	Infected	% Infected
0-5	14	4	4.3
6-14	41	14	15.2
19-40	87	54	58.7
Above 40	75	20	12.7
Total	217	92	100

Evidence of malaria Knowledge among participants

Basic malaria knowledge test was given to the participants on oral interview in simple English. Where the need arises, questions were interpreted to the language of choice for the participants. The result indicates that 154 (71.0 %) participants are knowledgeable about malaria and attest mosquito bit as malaria transmission method.

A total 121 (55.8%) and 32 (14.7%) agree that malaria is preventable by the use of bed net and destruction of mosquito. For malaria symptoms, 88 (40.5%), 35 (16.1%) and 45 (20.7%) attest that fever, headache and increase in body temperatures are the basic malaria symptoms.

Table 4: Evidence of malaria Knowledge among participants

Question	Option	Respondent (%)	Infected (%)
Do you have malaria knowledge	Yes	154 (71.0)	39 (18.0)
	No	20 (9.2)	14 (6.5)
	Not really	43 (19.8)	39 (18.0)
How is malaria transmitted	Mosquito bit	154 (71.0)	39 (18.0)
	Intense sun	5 (3.2)	3 (1.4)
	Stress	32 (14.7)	26 (12.0)
	Contaminated food/ water	25 (11.5)	21 (9.7)
What are the ways of preventing malaria	Use of bed net	121 (55.8)	32 (14.7)
	Use of protective cloth	34 (15.6)	29 (13.4)
	Drinking clean water	30 (13.8)	24 (11.0)
	Killing mosquito	32 (14.7)	7 (3.2)
Malaria symptoms	Fever	88 (40.5)	17 (7.8)
	Body pains	29 (13.4)	26 (12.0)
	Headache	35 (16.1)	19 (8.7)
	Increase body temperature	45 (20.7)	13 (6.0)
	Restlessness	20 (9.2)	17 (7.8)

Nigeria have made strict effort to curtail malaria disease and save the populace of the menace posed by the disease. Yet malaria occurrence has continually increased, particularly in localities with limited knowledge on the practical measures of preventing transmission. This study sampled 217 rural inhabitants with 154 (71.0%) having a good knowledge on malaria transmission and control strategies (designated group A) and 92 with no idea about the transmission and control strategy for the parasitic disease (designated group B). In group A, 39 (25.3%)

were infected and 53 (84.2%) were infected from group B. However, the total infective rate observed was 42.4%. This result suggests that malaria still portrayed a serious health problem in rural communities in Nigeria. Elsewhere, Ubiaru *et al.* (2018) reports that malaria disease constitutes a severe health concern in countries with continuous transmission including Nigeria. The infective pattern as seen in this study implies that having a good knowledge on the transmission pattern and prevention strategy for the deadly parasitic disease is

significant in the fight against malaria spread. The disparity in terms of prevalence between group A and B as observed in this study can be attributed to malaria knowledge and practical preventive attitudes exhibited by the participants in each group evaluated. This result is indicative that the rural inhabitants within the reach of Embassy hospital still need orientation on how best to play safe in the prevention of malaria in the locality. This submission agrees with Nasiru and Mohammad (2025) who reported that adequate hygiene knowledge is important in the quest for disease prevention in every locality. Ayanbamiji *et al.* (2024) reports that Nigeria needs continuous education on malaria knowledge regarding transmission and control and the importance of sleeping with insecticides treated net as a measure to mitigate malaria prevalence.

The result in this study revealed that malaria infection is not gender specific, as both males and female participants showed positive cases. However, female 57 (62.0%) participants had higher prevalence than males 35 (38.0%). In a similar study, Mogaji *et al.* (2018) reported more susceptible females than males. Lema *et al.* (2021) reported 47.7 % and 52.3% female and male prevalence respectively. The relatively higher susceptibility as observed among female participants in this study is not unconnected with domestic obligations, predisposing females to malaria vector attacks particularly at nights. The observation in this study was statistically significant ($p < 0.05$). The United Nations Development Programme (UNDP, 2015), reports that females are less knowledgeable on how to play safe on malaria prevention due to lower understanding rate.

Malaria was prevalence among people of all age range in this study. Although, those with adequate knowledge on the practical measures of staying safe from malaria vector recorded low malaria occurrence when compare with the group with limited understanding on how to practically avoid malaria infective and transmission pattern. This observation is indicative that age does not confer immunity against malaria infections on human, rather, orientation on how to play safe is significant in mitigating infections not minding age. However, participant under the age range of 15-40 (58.7%) showed higher prevalence. People between the ages of 19 -40 constitute the most active age engaged in rigorous endeavour such as fishing, hunting and farming for the substance of the household which increases vulnerability of people between this age (15-40) range to malaria infections. This observation is in contrast with the postulation that malaria is a serious disease of childhood (Ezenwaka and Ekine, 2025; Abebe *et al.*, 2024; Lema *et al.*, 2021; Yahaya *et al.*, 2012). However, Ayanbamiji *et al.*, (2024) reported higher malaria prevalence among individuals older than 30 years. The disparity observed in this study is significant of malaria knowledge.

Literatures have revealed high malaria susceptibility among the elderly (Pam *et al.*, 2018) contrary to the observation in this study. In this study, it was observed that the elderly (above 40 years) was the most knowledgeable and consistently play safe using treated mosquito net and ensure adequate sanitation around living homes to inhibit mosquito propagation and also employed regular medical checks ups. In the same vein, the knowledge of mothers influences child care and children between 0-5 years reported low prevalence as against previous reports on malaria susceptibility on infant and children vulnerability.

Evidence on malaria awareness suggests that enlightenment on malaria pattern of transmission and prevention strategies enable the individuals to avoid attitude considered risk of the disease. In situation where exposure is inevitable, the knowledgeable adopt the fastest means possible to stay safe by means of preventive diagnosis and treatment against manifestation of symptoms. This evidence was evidence among group A participants and recorded (25.3%) less infection when compare to the result in group B (84.1%) respectively. This result implies that, rural inhabitants predispose self to malaria on ignorance of causative agent strategy and possible preventive measures. The result of this study is in conformance with the opinion that achieving control for malaria in Nigeria require continuous rural orientation on practical measures of playing safe (Tesfay *et al.*, 2019).

CONCLUSION

The study summit that proper awareness on malaria transmission and prevention is essential in the fight to mitigate malaria disease in the rural communities. Adequate malaria knowledge will impact behaviour and prompt the individual to employ suitable practical measures to stay safe and mitigate burden, and reduces mortality in the rural communities.

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