UMYU Scientifica, Vol. 4 NO. 1, March 2025, Pp 189 – 199
https://doi.org/10.56919/usci.2541.019
ISSN: 2955 – 1145 (print); 2955 – 1153 (online)
A periodical of the Faculty of Natural and Applied Sciences, UMYU, Katsina

ORIGINAL RESEARCH ARTICLE

An Evaluation of Internally Displaced People's Malaria Status in Jos South LGA, Plateau State, Nigeria

Abba, Joseph Ogwuche[1,2]; Akindgh, Terver Mark[3]; Pam, Boyi Dagwom[4]; Amase, Nyamgee[1] and Edungbola, Luke Ekundayo[1]

[1]Department of Medical Microbiology and Parasitology, College of Health Sciences, University of Ilorin, Ilorin, Nigeria
[2]Infectious Disease Unit, Jos University Teaching Hospital (JUTH), Jos Nigeria
[3]Department of Zoology, Faculty of Natural Sciences, University of Jos, Jos, Nigeria
[4]National Coordinator, Calvary International Africa, Jos Nigeria

ARTICLE HISTORY

Received November 17, 2024
Accepted February 19, 2025
Published March 13, 2025

KEYWORDS

IDP, Malaria, Parasite density, KAP

ABSTRACT

Malaria, caused by *Plasmodium* and transmitted by female *Anopheles* mosquitoes, is a major health issue. This study, conducted from September 13-17, 2019, aimed to determine malaria prevalence among internally displaced persons (IDPs) in Anguldi, Jos South LGAs Plateau State Nigeria. A cross-sectional survey included participants aged 12-50 years. Blood samples were screened for *Plasmodium falciparum* using HRPII SD Ag rapid tests and microscopy. Among 284 participants, malaria prevalence was 57.7%. Females had a 56.5% infection rate, while males had 65.2% ($P<0.05$). The highest infection rate (69.6%) was in those aged 42-51, and the lowest (20.0%) in those aged 17-21. Additionally, 48.9% and 80.6% were unaware of malaria's cause and transmission mode, respectively. Only 16.5% identified transmission by infected female *Anopheles* mosquitoes. Despite Knowledge of ACT treatment (86.3%), prevention and control practices were inadequate. Malaria remains the primary health issue in the IDP camp. Enhanced awareness and proper malaria management interventions are needed.

INTRODUCTION

The parasitic protozoa of the genus Plasmodium, which cause malaria, are a potentially fatal disease that is spread primarily by bites from female Anopheles mosquitoes carrying the infection (WHO, 2020). Even in Nigeria's IDP camps, the frequency, severity, and consequences of malaria are rising. (Nigeria Malaria Indicator Survey, 2015). More than 80% of places impacted by humanitarian crises have an endemic malaria population. Like other parts of the world, Nigeria is currently dealing with a variety of natural and man-made calamities, such as the Boko Haram insurgency, insecurity, inter-communal conflicts, violence following elections, and floods. A number of factors have contributed to the majority of these disasters, including food scarcity, disruptions to health systems, increased mortality and morbidity in impacted communities, and difficulties in coping that have resulted in internally displaced persons (IDPs) where we have (Norwegian Refugee Council, 2015). Malaria is a prevalent illness that can affect the health system in IDP camps (Connolly et al., 2002).

Malaria is one of the most significant health issues of our time, affecting a vast number of people in Nigeria, including the Plateau State and many other states (Istifanus et al., 2017). Nigeria is endemic for malaria (Shekarau et al. 2024). Other possible explanations for the high rate of malaria infection in the IDP camps include the proximity of susceptible and infected hosts, increased exposure to malaria vectors during outdoor sleeping, migration from non-endemic to endemic areas, interruptions to disease control efforts, incapacity or lack of use of ITNs, etc. (Istifanus et al., 2017; Connolly et al., 2002).

According to the Internal Displacement Monitoring Center, as of October 2018, there were 2,152,000 internally displaced people in Nigeria, spanning 27 local government areas across 13 states (Norwegian Refugee Council, 2015). This amounts to approximately 40% of all internally displaced people living in all 36 states of Nigeria, including the Federal Capital Territory. According to the National Emergency Management Agency (NRC, 2015), there are no fewer than 325,000 internally displaced people (IDPs) seeking safety in several camps around Plateau State, Nigeria. Thus, the malaria status among

Correspondence: Abba, Joseph Ogwuche. College of Health Sciences, Faculty of Basic Medical Sciences, Department of Medical Microbiology and Parasitology, University of Ilorin, Ilorin, Nigeria. ✉ josephabba89@gmail.com.
How to cite: Abba, J. O., Akindgh, T. M., Pam, B. D., Amase, N., & Edungbola, L. E. (2025). An Evaluation of Internally Displaced People's Malaria Status in Jos South LGA, Plateau State, Nigeria. *UMYU Scientifica*, 4(1), 189 – 199. https://doi.org/10.56919/usci.2541.019

internally displaced people in Plateau State is diminutive. This study thereby provides baseline data.

MATERIALS AND METHODS

Study area

The study was conducted in geoscience Anguldi (Figure 1), which is located in Jos South Local Government Areas in Plateau State, Central Nigeria, with an annual temperature of 18.8^{o}C and latitudes of 9o43'44.76"N and 8o47'28.97"E. Its headquarters are in the town of Bukuru, which is located at 9°48'00 N and 8°52'00 E.

The sample size determination was calculated using Yamani formula: (Israel, G.D. 1992), n = N/1 + Ne2 Where n = sample size,

N = sampling population (935),

e = marginal error (5% was used here). Therefore, n = 935/1 + 935 (0.05)2 n = 284.

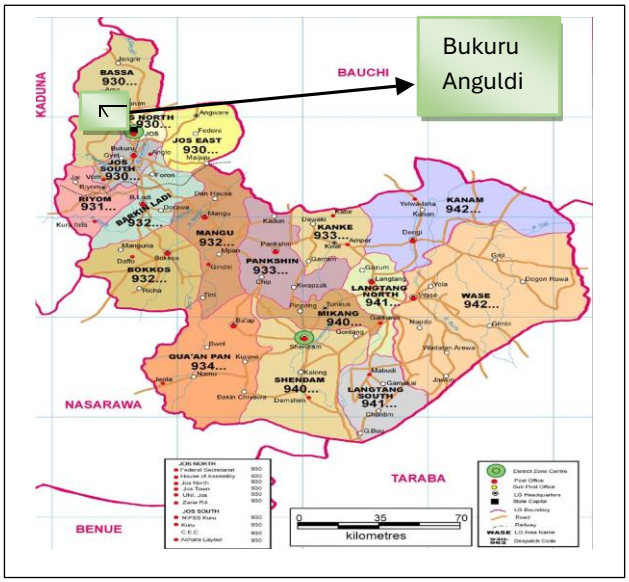

Figure 1: Map of Plateau State showing the study site

The climate of the Plateau State is distinct and lovely, making it ideal for growing cotton, groundnuts, rice, Irish potatoes, maize, and soybeans. The temperatures in December and January are below 15°C. The greatest months of the year, February and March, see another temperature increase to almost 30 degrees Celsius. During the rainy season, the temperature drops to roughly 20°C. The two main winds in Anguldi, Plateau State, are the rain-bearing southwesterly winds and the chilly, dry, and dusty northeasterly winds known as the Harmattan. These winds cause the region's tropical climate, which features wet and dry seasons. The dry season, which lasts from November to March, is marked by a period of chilly weather and the dusty, dry Harmattan wind, which is most noticeable in the north in December and January. The damp season occurs from April to October.

Ethical Consideration and Approval

The University of Ilorin Ethical Review Committee with Ref UIL/UERC/06/68LL001 provided the approval for the research protocol and ethical clearance for the implementation of the study. Permission was sought from the camp manager, and a consent form was given to the study subjects for their consent to participate in the study. Also, adequate explanations were given to the study participants and the benefit of the study to them, and at any point they are free to withdraw from the study. An interviewer-administered semi-structured questionnaire was used for the collection of the data, according to Zablotsky *et al.* (2023). Knowledge, Attitudes, and Practices (KAP) Survey on Malaria.

Sample collection and Preparation for *Plasmodium falciparum* Detection

An intravenous blood sample of 1 mL was collected in an EDTA bottle in accordance with standard laboratory procedures for all study participants. Following this, an immune chromatographic assay using the HRPII SD-PAN Ag rapid test (RDT) was performed to screen for the presence of the malaria parasite for *Plasmodium falciparum*. A microscopy slide template was used to create 6 µL thick and 2 µL thin blood films, which were then stained with 10% Giemsa and viewed under an X100 light microscope to identify the malaria parasites. The parasite density was determined for all positive samples at the APIN-supported HIV clinic (malaria unit), Jos University Teaching Hospital (JUTH), Jos, Nigeria.

RESULT

Overall Malaria Prevalence among IDPs: From September 13–17, 2019, 248 participants were examined in the IDP camp. Of these, 246 (86.6%) were female and 38 (13.0%) were male. The participants' ages ranged from 12 to 50 years, and their ethnic groups included Berom 280 (98.5%), Ron 2 (0.7%), and Kulere 2 (0.7%). They had been in the camp for 8–14 months, and 124 (43.6%) had completed primary education, 110 (38.7%), and tertiary 50 (17.6%). All participants in the IDP camp were Christian. Of the 284 IDPs examined, 164 (57.7%) had Plasmodium falciparum malaria (Figure 1).

Malaria prevalence among internally displaced people (IDPs) by gender: According to Table 4.1, 246 (56.5%) of the females and 38 (65.8%) of the males were infected with malaria. As a result, 65.8% of men and 56.5% of women were respectively much more infected (P<0.05).

Malaria prevalence among internally displaced persons (IDPs) by age group: According to Table 4.2, the age group most affected by Plasmodium falciparum malaria was 42–51 69 (69.6%), whereas the least affected age group was 17–21 20 (30.0%). Accordingly, there was a significant difference (P<0.05) in the prevalence of

Plasmodium falciparum malaria among IDPs according to age group.

Malaria Prevalence by Ethnicity: Berom makes up the majority of the three ethnic groupings, with 99% of cases. Malaria prevalence is 57% among the Berom, but the sample sizes of the other 2 ethnic groups are noticeably too small (Table 4.3). Nonetheless, there was a notable variation in the frequency of malaria among IDPs according to ethnic group. (P<0.05).

Malaria Prevalence by Educational Level: Three educational levels—Primary, Secondary, and Tertiary—were found among the 284 IDPs that were studied (Table 4.4). Compared to IDPs with primary and tertiary levels of education, those with secondary education made up the majority and had a much higher prevalence of malaria (63.6%). The proportion of IDPs with primary (52.8%) and secondary (52.0%) education was equal. However, there was no discernible variation in the prevalence of malaria between the educational levels of the IDP population. P is greater than 0.05. (P>0.05).

Malaria Prevalence by Educational Level: Three educational levels—Primary, Secondary, and Tertiary—were found among the 284 IDPs that were studied (Table 4.4). Compared to IDPs with primary and tertiary levels of education, those with secondary education made up the majority and had a much higher prevalence of malaria (63.6%). The proportion of IDPs with primary (52.8%) and secondary (52.0%) education was equal. However, there was no discernible variation in the prevalence of malaria between the educational levels of the IDP population. P is greater than 0.05. (P>0.05).

IDs' sociodemographic characteristics: Of the internally displaced people (IDPs) in the camp, 87.0% are female and 13.0% are male. Additionally, there was a significant difference in the prevalence of malaria between the genders of IDPs (P<0.05). There was a significant difference between IDPs by age group (P<0.05), with the age group of 32–41 having the greatest *Plasmodium falciparum* infection among the IDPs in the camp with 113 (40.0%). There was a significant difference in the prevalence of *Plasmodium falciparum* malaria among IDPs based on ethnicity (P<0.05), with Berom being the most prevalent ethnic group with 98.6% (280) of the total. There was a significant difference in the frequency of malaria among IDPs according to their educational level (P<0.05). Of them, 44.0% completed primary school, 39.0% completed secondary school, and 17.0% completed university education. 4.5 Table. There was a significant correlation (P<0.05) between the period of stay in the IDP camp and the prevalence of malaria, with 52.1% of the 284 IDPs staying for 8 months and 1.4% for 14 months. Table Five. 66.2% of the 284 professionals among the IDPs were farmers, and there was a notable disparity in malaria prevalence among IDPS' occupations. (P<0.05) Table 5.

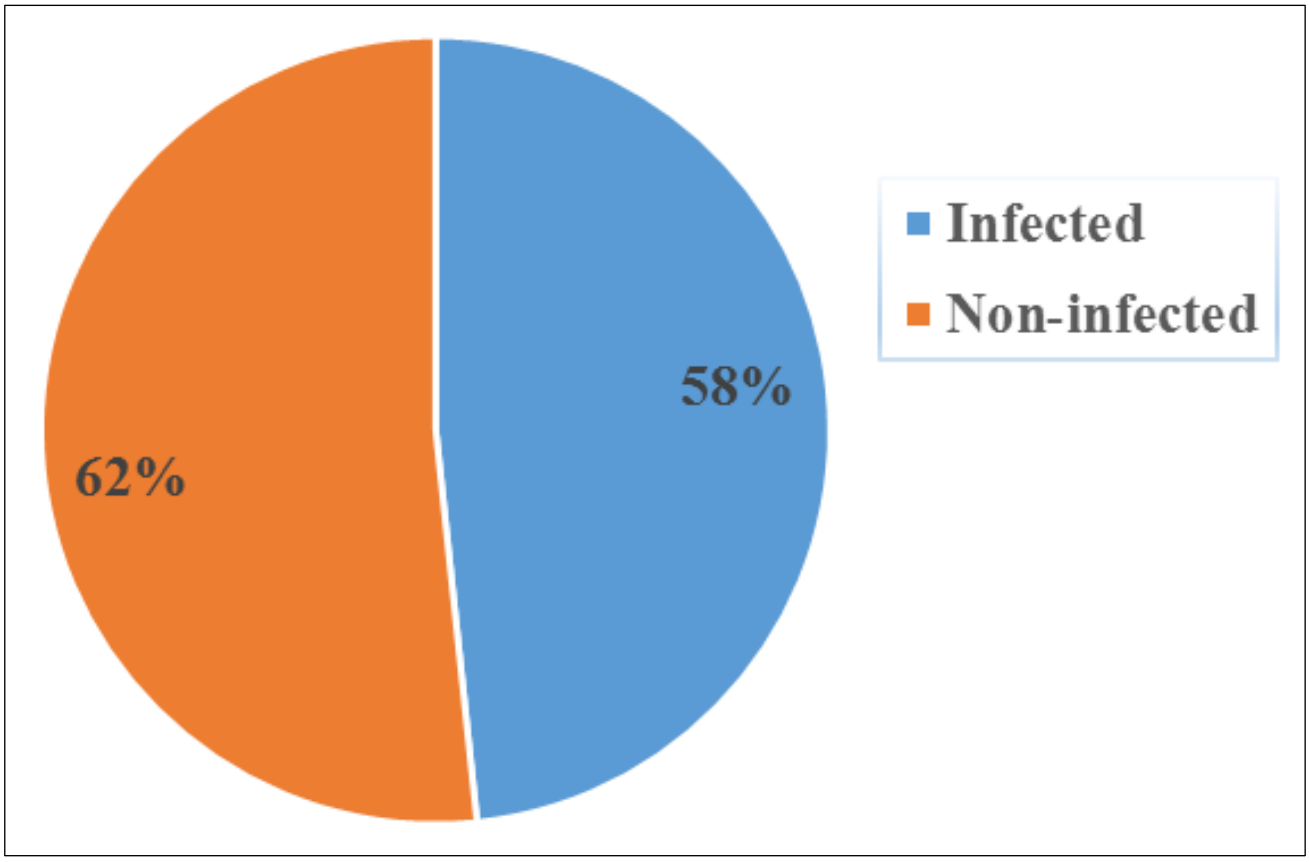

Figure 2: Overall prevalence of *Plasmodium falciparum* malaria among IDPs.

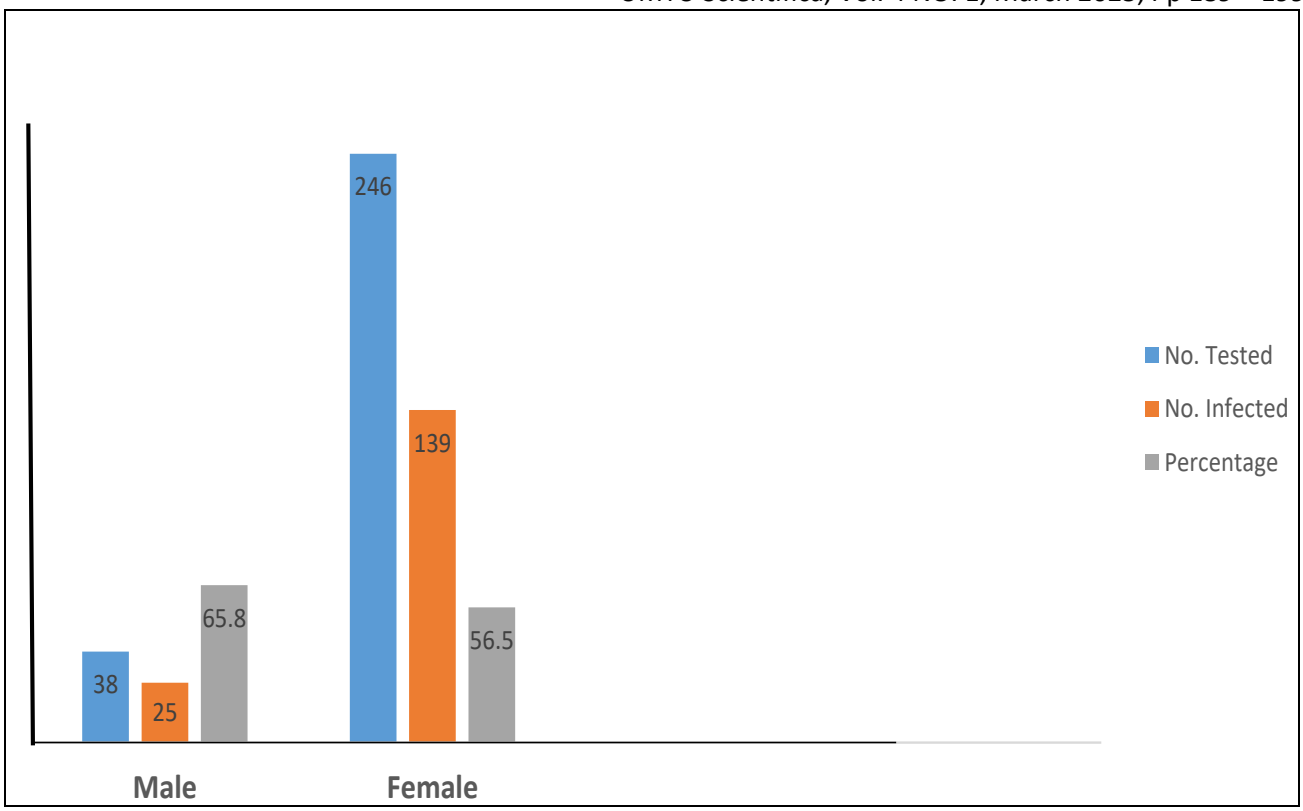

Figure 3: Prevalence of malaria among IDPs by gender

χ^2	1.163
P-value	0.02

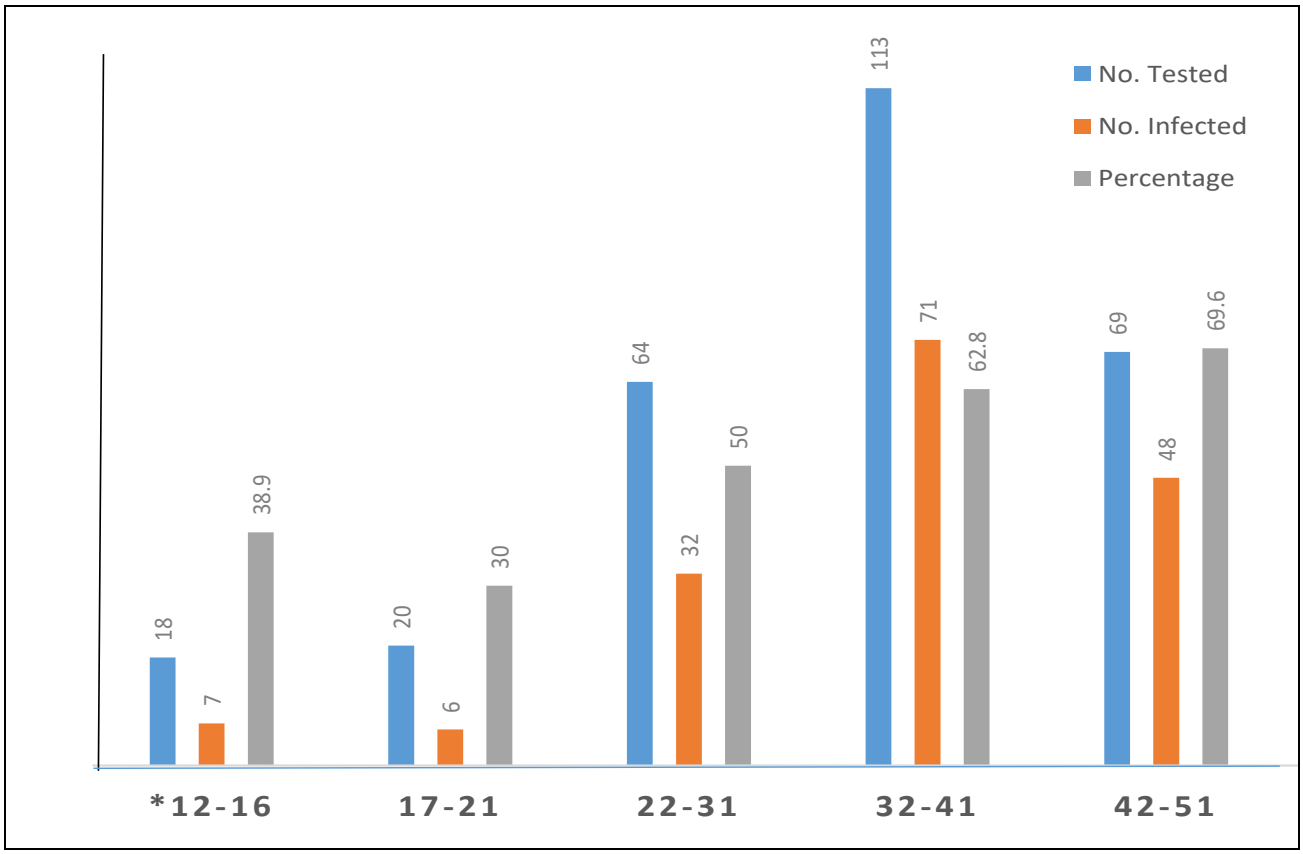

Figure 4: Prevalence of malaria among IDPs by age group

χ^2	15.655
P-value	0.003

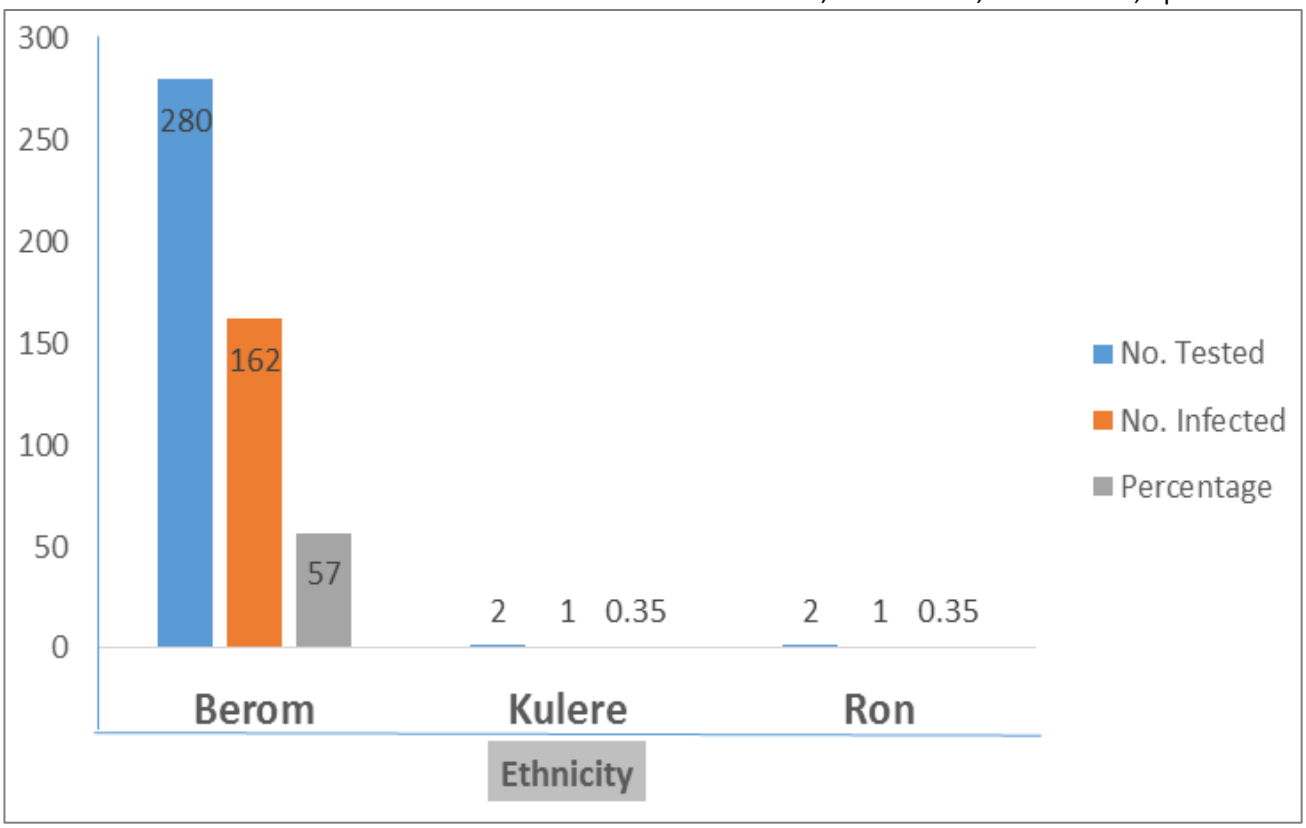

Figure 5: Prevalence of *Plasmodium falciparum* malaria among IDPs by Ethnicity

χ^2	0.099
P-value	0.04

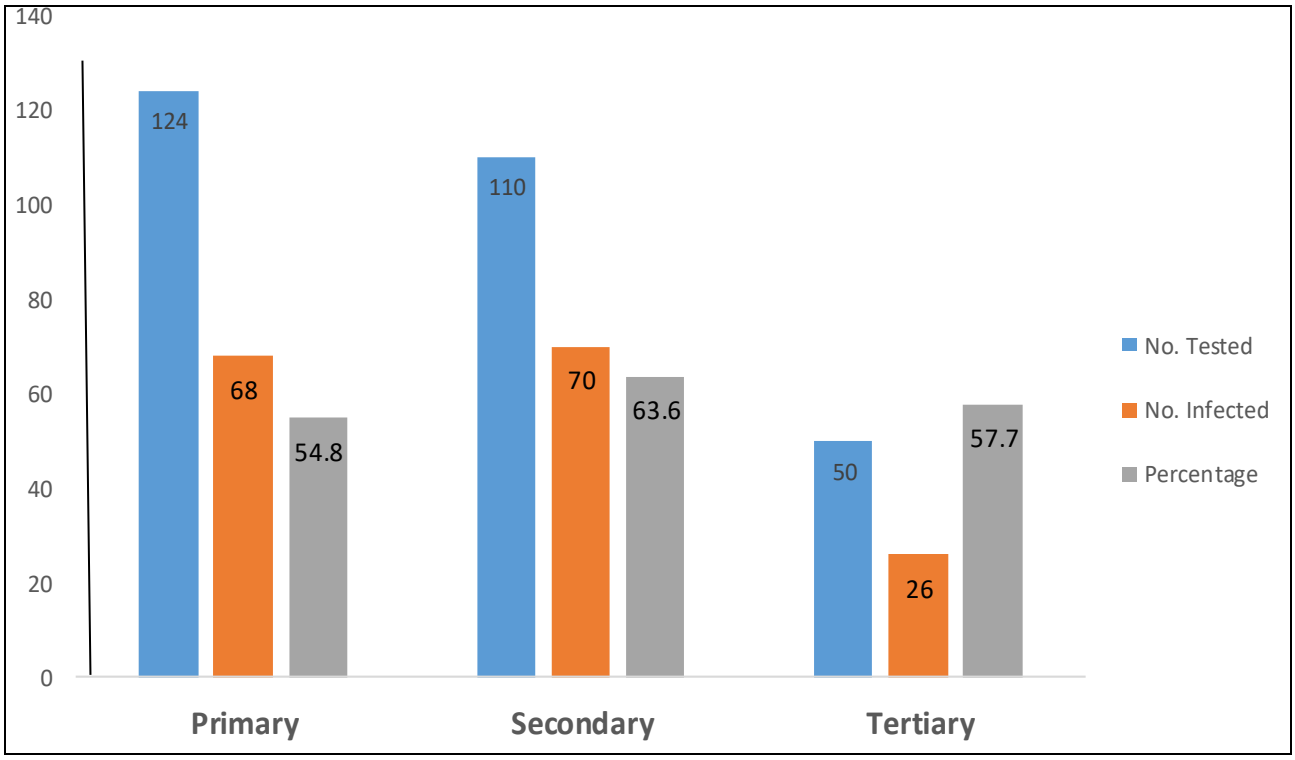

Figure 6: Malaria prevalence by educational level

χ^2	1.99
P-value	0.36

x

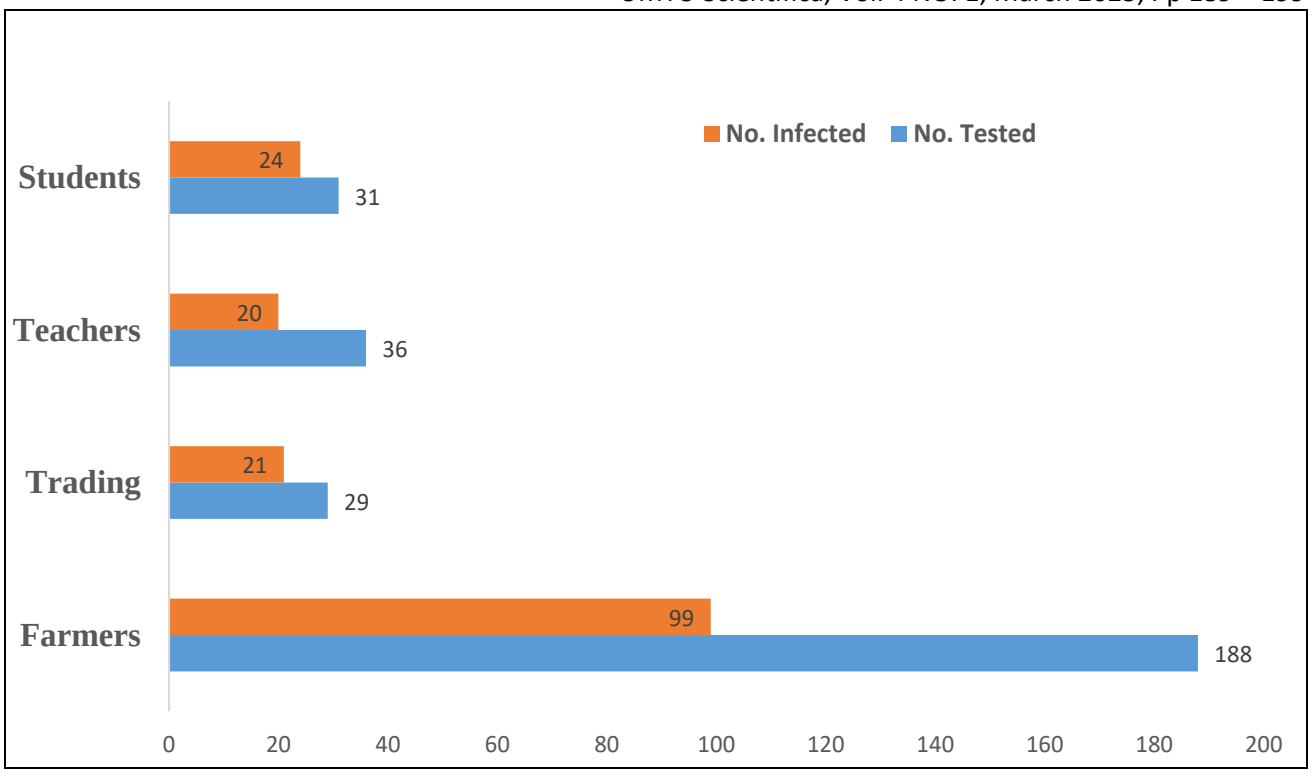

Figure 7: Prevalence of malaria among IDPs by occupation

χ^2	9.538
P-value	0.022

Knowledge, attitude, and practice (KAP) among the internally displaced people (IDPs): Of the 284 (100.0%) IDPs surveyed, 164 of 284 were infected with malaria; of these, 17% correctly associated malaria with mosquito bites as the mode of transmission; 214 (75%), however, very little information about malaria came from health workers 4.2%. IDPs' knowledge of malaria symptoms was high, at 67% (191); only approximately 33% of the respondents had little knowledge about malaria symptoms. The majority of participants (87%) knew that effective malaria medication was available and exhibited positive treatment-seeking behavior. Table 6. However, 28 (9.9) took one dose or half of anti-malaria medication, which is an indication of anti-malaria drug resistance.

Respondent's knowledge and practice about malaria preventive measures in the IDPs camp.

The usage of LLIN-treated bed nets and knowledge of malaria prevention methods were both high (88%). However, 12% provided additional strategies for avoiding contact with malaria vectors. 90% of mosquitoes, which are carriers for malaria, hide in dark areas of the house during the day. The remaining 10% of the space is designated for additional daytime hiding locations for malaria vectors. Ninety-one percent of IDPs knew when malaria vector mosquitoes bite. They also knew a high percentage of breeding sites (99%) and biting times (91%). (Table 7).

DISCUSSION

Overall prevalence of *Plasmodium falciparum* malaria among Internally Displaced Persons (IDPs)

In Jos South LGA, Plateau State, North Central Nigeria, a study was conducted to evaluate the malaria status of internally displaced individuals. Of the 284 IDPs examined, 164 had an overall prevalence of Plasmodium falciparum malaria (57.7%). This was noticeably higher than the malaria prevalence across Nigeria (27%), in North East Nigeria (50%), and in Plateau State (34.3%) (Shwe et al., 2018). The disparity in prevalence indicates that poverty, ignorance, neglect, overcrowding, and poor health care contributed to a higher intensity of illness transmission among internally displaced people. On the other hand, a significant contributing component can be the differences in research duration and methods.

Prevalence of *Plasmodium falciparum* malaria among Internally Displaced Persons (IDPs) by gender.

According to Table 1, the prevalence of *Plasmodium falciparum* malaria among IDPs by gender reveals that 38 males (65.8%) and 246 females (56.5%) are infected. This finding is consistent with a study conducted by Eshag et al. (2020), which found that the prevalence of malaria was 67.1% for males and 56.8% for females. Perhaps different genders in the IDP camp are more or less exposed to malaria vector bites? Connolly et al. (2002) found that

malaria infection is the leading cause of morbidity and mortality in displaced populations, especially when there are high rates of malnutrition. Istifanus et al. (2017) also reported that males in the IDP camp have a higher prevalence of *Plasmodium falciparum* malaria due to increased exposure and seasonal migration to support the family. A significant difference in malaria prevalence among IDPs by gender was observed. (P<0.05).

Prevalence of *P. falciparum* malaria among IDPs by age group: The age range 42–51 69 (69.6%) had the highest prevalence of malaria among IDPs, while the age group 17–21 20 (30.0%) had the lowest prevalence of *Plasmodium falciparum* malaria (Table 2). Accordingly, there was a significant difference (P<0.05) in the prevalence of Plasmodium falciparum malaria among IDPs according to age group.

Prevalence of *P. falciparum* malaria among IDPs by Ethnicity: The majority (99.0%) of the three ethnic groups are Berom. Malaria prevalence is 57% among the Berom, whereas samples from the other two ethnic groups are too small to be statistically significant, and there is a considerable variation in malaria prevalence among IDPs based on ethnicity. (P<0.05).

Malaria prevalence by educational level among IDPs: Three educational levels—Primary, Secondary, and Tertiary—were discovered among the 284 IDPs that were analyzed. Compared to IDPs with primary and tertiary levels of education, those with secondary education made up the majority and had a much higher prevalence of malaria (63.6%). (Table 4). The proportion of IDPs with primary (52.8%) and secondary (52.0%) education was equal. This could be because they were not as knowledgeable about malaria preventive measures and did not put them into practice, such as sleeping under an LLIN; however, there was no discernible difference in the prevalence of malaria among IDPs based on educational attainment. P is greater than 0.05.

Table 5: Sociodemographic characteristics of IDPs in the study area

Characteristics	No. Examined	No. Infected (%)	χ^2	P-value (0.05)
Gender				
Male	38	25 (65.8)		
Female	246	139 (56.5)	1.163092	0.02
Age group in years				
12-16	18	7 (38.9)		
17-21	20	6 (30.0)	15.65546	0.003
22-31	64	32 (50.0)		
32-41	113	71(62.8)		
42-51	69	48 (69.6)		
Ethnicity				
Berom	280	162(57.9)		
Ron	2	1(50)	0.099779	0.04
Kulere	2	1(50)		
Marital status				
Married	252	145 (57.5)		
Single	32	19 (59.3)		
Religion				
Christianity	284	164 (57.7)		
Muslim	0	0(0.0)		
Level of education completed				
Primary	124	68 (54.8)		
Secondary	110	70 (63.6)		
Tertiary	50	26 (52.0)	1.9936199	0.36
Duration of stay in the camp (in months)				
8	148	85 (57.4)		
9	14	8 (57.1)		
10	77	35 (45.4)		
11	11	9 (81.8)		
12	30	25 (83.3)	15.53624	0.008
14	04	2 (50)		
Distribution of IDPs by occupation				
Trading (Business)	29	21 (72.4)		
Teachers	36	20 (55.5)		
Farmers	188	99 (52.7)	9.538581	0.022
Students	31	24 (77.4)		

Table 6: Respondents' Knowledge, Attitude and Practice about malaria.

Characteristic	n (%)
Heard about malaria	
Yes	284 (100.0)
No	0(0.0)
Sources of information	
Hospital	214(75.4)
Health worker	12(4.2)
Radio	14(4.9)
Television	09(3.2)
Neighbors	20(7.0)
Suffered malaria	8(2.8)
Mode of malaria transmission	
Bite of infected anopheles female mosquitoes	47(16.5)
Bite of any mosquitoes	91(32.0)
Don't know	139(48.9)
Causes	
Dirt	23(8.0)
Stagnant water	24(8.5)
Plasmodium species	08(2.8)
Don't know	229(80.6)
Symptoms	
Fever	191(67.3)
Fever plus shivering	78(27.5)
Headache	15(5.3)
How do you treat malaria	
Use drugs from the doctor	201(70.8)
Home treatment with anti-malaria	10(3.5)
Take a full course of anti-malaria medicine	45(15.8)
Take a single dose/Half of the anti-malaria	28(9.9)
Medication used	
ACT	245(86.3)
Chloroquine	30(10.6)
Fansidar	9(3.2)
First response if your child develops a fever	
Go to the hospital	260(91.5)
Self-treatment at home	05(1.8)
Go to chemist	19(6.7)

Table 7: Respondent's Knowledge and practice about malaria preventive measures in the IDPs camp.

Characteristic	n (%)
Preventive measures	
Use of LLIN treated bed nets	251(88.3)
Use of window nets	5(1.7)
Use of insecticides spray	10(3.5)
Use of mosquitoes coils	12(4.2)
Vector hiding places	
Dark places in the house during the day	256(90.1)
Stagnant water	11(3.9)
Dirty places	10(3.5)
Inside tires	07(2.5)
Vector habitat	
Bushes	03(1.1)
Crevices	01(0.4)
Stagnant water	280(98.6)
Vector biting period	
Night	257(90.5)
Day time	12(4.2)
Any time	15(5.3)

Prevalence of *P. falciparum* malaria among IDPs by occupation: Of the many occupations that were looked at among IDPs, students made up 31 (77.4%), and traders made up 29 (72.0%). Although traders are exposed when they travel and do business to support their families, they are less infected than students. There was a significant difference in the prevalence of malaria among IDPs by occupation (P<0.05). Farmers had 188 (50.0%) infected individuals; this could be due to their occupation as farmers, where they are constantly exposed to malaria vector bites and must migrate seasonally to support their families. Teachers had 36 (56.0%) infected individuals. One could argue that teachers and students are well-versed in malaria preventive measures, but that is not the case here, or not all knowledge is put into practice.

Sociodemographic characteristics of IDPs in the study area: The camp's internally displaced people (IDPs) exhibit different sociodemographic traits; a higher percentage of females (87.0%) than males (13.1%) have *P. falciparum* malaria infection. The higher proportion of females may be attributed to polygamy, a high rate of male deaths from war, or men staying on the front lines of battle; yet, there was a significant difference in the frequency of malaria among IDPs in the camp based on gender (P<0.05). There was a significant difference in the prevalence of Plasmodium falciparum malaria among IDPs by age group (P<0.05), with the age group of 42–51 having the highest infection rate (69.6%) and the age group of 17–21 having the lowest infection rate (20.0%). In the meantime, 98.6% of the ethnic group residing in the Berom IDP camp is protuberant, and 57.0% of them have *Plasmodium falciparum* malaria. This protuberance may be due to the tribe that has been most affected by the crises and occupies a larger portion of Plateau State. There was a notable variation in *Plasmodium falciparum* malaria rates among IDPs based on their ethnic background. (P<0.05). According to the educational status of internally displaced people, P. falciparum malaria-infected 54.8% of primary school students and 63.6% of secondary school students. There was a significant difference (P<0.05) in the prevalence of *Plasmodium falciparum* malaria, depending on how long a person stayed in the IDP camp. 83.3% of IDPs who spent up to a year in camp were afflicted with malaria. The longer a person stays in the IDP camp, the more likely it is that they will have malaria because of the subpar conditions there and the interruption of federal government intervention methods during that time.

Knowledge attitude and practice of IDPs on malaria (KAP): In line with previous research, the study found that all participants had heard about malaria (Mazigo et al., 2010; Chovatiya et al., 2013; Abate et al., 2013). Although there is a significant prevalence of malaria among internally displaced people (IDPs), both among males (66%) and females (57%), this may indicate that the IDPs' high level of awareness of malaria does not convert into actual malaria prevention and control. According to studies conducted in Nigeria, hospitals are their main source of information on malaria (Olayemi et al., 2012; Fatungase et al., 2012). Of the study population, 48.9% and 80.6% had gaps in their knowledge regarding the mode and cause of malaria transmission, respectively, whereas only 16.5% of participants gave accurate answers. Comparing this to the results of other studies conducted throughout Africa, the research participants' level of knowledge regarding the mechanism of malaria transmission and its cause was low—only 2.8% of them correctly identified the cause of malaria (Abate et al., 2013; Amron, 2013; Masangwi et al., 2012). The low level of educational activity in the camps for internally displaced people and the areas from where the individuals originated may be the cause of this. In order to take effective malaria preventative measures, it is important to understand the behavior of the malaria vector, and among the study population in this study, this comprehension was reasonably high. Given that the majority of respondents cited fever as the most common symptom of malaria (67.3%), the study population has established a good knowledge of common symptoms of malaria. This level of consciousness of the clinical features of malaria may be due to increased access to health education from hospital staff, the media, and personal experience with the disease. On the other hand, some respondents have a fair knowledge of malaria symptoms, which is consistent with observations from other related studies (Joshi et al., 2008; Hanafi-Bojd et al., 2011; Okwa et al., 2011). The study participants, comprising 88.3% of the sample, possessed extensive knowledge of the application of Long-lasting Insecticide Nets (LLIN) as a preventive intervention against malaria. We were unable to establish the usage of any bed nets (LLIN or non-ITNs) in the IDP camp despite the fact that 83.8% of people use LLIN bed nets to prevent contact with the malaria vector at home. This poor knowledge may be the result of the camp's lack of educational efforts. Ninety-one percent of the respondents had some knowledge of the most common locations in the home where malaria vectors hide during the day (90.1%), while the remaining three percent had little understanding of the subject. Ninety-one percent of the respondents knew when the malaria vector bites, but ninety-five percent knew very little. Ninety-eight percent of the study population is aware that malaria vectors breed in stagnant water, but knowledge of this fact does not always translate into better practices. The study population's use of hospitals for malaria treatment demonstrates progressive attitudes (91.5%), which is consistent with research from Ethiopia (Abate et al., 2013). This may be related to the issue of the quality and accessibility of health facilities. 1.8% of the population treats their malaria at home, which may be due to their inability to pay hospital bills and their need for immediate treatment (which is consistent with research from Nigeria (Okwa et al., 2011 & 2012; Fatungase et al., 2012). 6.7% of the study population sought assistance from a chemist, as some of the study population in the IDP camp received initial treatment for perceived malaria from a patent and proprietary vendor medicine shop (PPVM), whose veracity and efficacy are in question. They should be well thought-out when designing treatment and intervention

programs also. Others identify mosquito preventive measures in practice as the use of mosquito coils (6.3%), the use of insecticides 3.2%, and others should be strategically targeted to given behavioral change communication (BCC) to upgrade their knowledge. The PPMV must be educated on the signs and symptoms of malaria as well as appropriate treatment, which includes antimalarial medication doses. In other malaria-endemic locations, it has been demonstrated that these educational interventions alter the behavior of individuals seeking treatment for malaria (Tavrow et al., 2003; Oguche et al., 2004). By preventing misuse and underdosing, making sure medication sellers are aware of the right medication regimen for treating a malaria episode may help prevent the rise of drug resistance. The study found that 86.3% of respondents understood the anti-malaria drug of choice (ACT) and how to treat malaria with it as long as the doctor gave the patient the medication for three days. However, while this knowledge is useful, it may not always result in better practice, as 3.2% of respondents gave Fansidar, and 10.6% of respondents gave chloroquine. These are drugs that studies have established their little effect on the malaria parasites, especially Plasmodium falciparum in Nigeria (Oguche, et al., 2004; Molta, 2004).

CONCLUSION

The study found a high prevalence of *Plasmodium falciparum* malaria among internally displaced people (IDPs) in the study area, with higher rates in males and those aged 42-51. Despite having a fair understanding of the disease, there were inadequate behaviors for controlling and preventing it, highlighting the need for improved prevention strategies.

CONFLICT OF INTEREST

None

REFERENCES

Abate, A., Degarege, A., Erko, B. (2013). Community knowledge, attitude and practice about malaria in a low endemic setting of Shewa Robit Town, northeastern Ethiopia. *British Medical Council Public Health.* 2013;13:312. https://doi.org/10.1186/1471-2458-13-312

Abuya T.O., Mutemi, W., Karisa, B., Ochola, S.A., Fegan, G., Marsh, V. (2007). Use of over-the-counter malaria medicines in children and adults in three districts in Kenya: Implications for private medicine retailer interventions. *Malaria Journal.*6:57. https://doi.org/10.1186/1475-2875-6-57

Ahmed, S.M., Hossain, M.A. (2007). Knowledge and practice of unqualified and semi-qualified allopathic providers in rural Bangladesh: Implications for the HRH problem. Health Policy. 84:332–43. https://doi.org/10.1016/j.healthpol.2007.05.011

Amron, O.E. (2013). Impact of health education intervention on malaria prevention practices among nursing mothers in rural communities in Nigeria. *Nigeria Medical Journal.* 2013;54:115–22. https://doi.org/10.4103/0300-1652.110046

Chovatiya SK, Gajera NB, Soni VC. (2013). People's perception on malaria: A case study in rural areas of Rajkot district, Gujarat-India. *Health Science International Journal*; 2:1–5.

Connolly, M.A., Heymann, D.L. (2002). Deadly comrades: War and infectious Diseases. *Lancet.* 360:S23-4. https://doi.org/10.1016/S0140-6736(02)11807-1

Fatungase, K.O., Amoran, O.E., Alausa, K.O. (2012). The effect of health education intervention on the home management of malaria among the caregivers of children aged under 5 years in Ogun State, Nigeria. *European Journal Medical Research.* 17:11. https://doi.org/10.1186/2047-783X-17-11

Hanafi-Bojd, A.A., Vatandoost, H., Oshaghi, M.A., Eshraghian, M.R., Haghdoost, A.A., Abedi, F. *et al.,* (2011). Knowledge, attitudes and practices regarding malaria control in an endemic area of southern Iran. *Southeast Asian Journal Tropical Medical Public Health.* 42:491–501.

Istifanus A.J.,Benjamin, David. B., Abdulrazak, A.G., Alhaji, A. A., Audu, O., Awawu, G.N., Jerry, G.M., Matthew, B., Abimbola, G., Olayemi, K.A. (2017). Social Characteristics and Risk Factors for Diseases among Internally Displaced Persons: A Study of Stefano's Foundation Camp in Jos, Nigeria. *Archives of Medicine and Surgery:* 1(2):42-49.

Joshi, A.B, Banjara, M.R.. (2008). Malaria related knowledge, practices and behaviour of people in Nepal. *Journal of Vector Borne Diseases.* 45:44–50.

Masangwi, S.J., Grimason, A.M., Morse, T.D., Ferguson, N.S., Kazembe, L.N. (2012). Community knowledge variation, bed-net coverage and the role of a district healthcare system, and their implications for malaria control in southern Malawi. *South African Journal of Epidemiology Infection*; 27:116–25. https://doi.org/10.1080/10158782.2012.11441496

Mazigo, H.D., Obasy, E., Mauka, W., Manyiri, P., Zinga, M., Kweka, E.J., et al. (2010). Knowledge, attitudes, and practices about malaria and its control in rural northwest Tanzania. *Malaria Research Treatment*: 794261. https://doi.org/10.4061/2010/794261

Molta, N.B., Oguche, S., Pam, S.D., Afolabi, B.M., Amajoh, C.N. *et al.,* (2004). Declining efficacies of chloroquine and sulphadoxine combination against *Plasmodium falciparum* on the North central Plateau Nigeria: Parasitological performance of

the drugs. *Nigerian Journal of Parasitology*. 25:57-63. https://doi.org/10.4314/njpar.v25i1.37710

Nigeria Malaria Indicator Survey (2015). *Federal Ministry of Health, Abuja,* Nigeria.

Norwegian Refugee Council. IDMC. Global Overview 2015, People Internally Displaced by Conflict and Violence; 2015. p. 210-39.

Oguche, S., Molta, N.B., Pam, S.D., Omalu, I.C.J., Odujoko, J.B., Amajoh, B., Wuyep, V.P. (2004). Comparative assessment of the clinical performance of chloroquine and sulphadoxine pyrimethamine in the treatment of *Plasmodium falciparum* infection in Plateau State: An open randomized study of 109 children with acute uncomplicated malaria. *Nigeria Journal of Paediatrics*. 31(3) 87-92. https://doi.org/10.4314/njp.v31i3.12107

Okwa, O.O., Bello, B.A., Olundegun, S.A. (2011). Social aspects of malaria among students in two tertiary institutions in Lagos, Nigeria. *Sierra Leone Journal Biomedical Research*. 3:97–103. https://doi.org/10.4314/sljbr.v3i2.71810

Okwa, O.O., Soremekun, B.M., Adeseko, O., Raheem, A.M. (2012). Artisans and traders' knowledge, attitude and practices of malaria in selected areas of Lagos, Nigeria. *Advance Research Journal Medical Science*.1:68–74.

Olayemi, I.K., Omalu, I.C., Abolarinwa, S.O., Mustapha, O.M., Ayanwale, V.A., Mohammed, A.Z., et al, (2012). Knowledge of malaria and implications for control in an endemic urban area of north central Nigeria. *Asian Journal of Epidemiology* 2012;5:42–9. https://doi.org/10.3923/aje.2012.42.49

Owoaje, E.T., Uchendu, O., Ajayi, T.O., Cadmus, E. (2016). A review of the health problems of internally displaced persons in Africa. *Nigeria Postgraduate Medical Journal*; 23:161-71. https://doi.org/10.4103/1117-1936.196242

Shekarau, E., Uzoanya, M., Ogbulafor, N. (2024). Severe Malaria Working Group. *Malaria Journal*. 23:177. https://doi.org/10.1186/s12936-024-05001-1

Shwe, D.D., Ofakunrin, A.O.D.,, klison, D.B, Christopher, B., Gana, I.R., Magaji, E.T., Moses, A.L., *et al.,* (2018). Sero-prevalence of *Plasmodium falciparum* malaria in Rural Communities of Bassa, Plateau State. *Jos Journal of Medicine:* 12(1):1-7.

Tavrow, P., Shabahang, J., Makama, S. (2003).Vendor-to-vendor education to improve malaria treatment by private drug outlets in Bungoma District, Kenya. *Malaria Journal*; 2:10. https://doi.org/10.1186/1475-2875-2-10

United Nations guiding principle on Internal Displacement. UN Documents: Gathering a body of global agreements, 1998. E/ CN.4/1998/53/Add. Available from: www.un-documents.net/gpid.htm (Last accessed on 12 Dec 2018). Noji, E. (1997). Public Health Consequence of Disasters. New York: Oxford Press; 1997.

World Health Organization (2018). World Malaria Report. https://www.who.int/en/news-room/fact-sheets/detail/malaria

World Health Organization (2020). World Malaria Report. https://www.who.int/en/news-room/fact-sheets/detail/malaria.

World Health Organization. Communicable Diseases Following Natural Disasters: Risk Assessment and Priority Interventions. Programme on Disease Control in Humanitarian Emergencies Communicable Diseases Cluster. Geneva: WHO; 2006. Available from: http://www.who.int/ disease control emergencies/guidelines/CD_Disasters_26_06.pdf. (Last accessed on 10 March 2019).

World Health Organization. Malaria Control in Complex Emergencies: An Interagency Field Handbook. Geneva: World Health Organization; 2005. Available from: https://www.who.int/malaria/publications/atoz/924159389x/ en/. (Last accessed 10:03:19).

Zablotsky, B., Lessem, S. E., Gindi, R. M., Maitland, A. K., Dahlhamer, J. M., & Blumberg, S. J. (2023). Overview of the 2019 National Health Interview Survey questionnaire redesign. *American Journal of Public Health, 113*(4), 408–415. https://doi.org/10.2105/AJPH.2022.307197