Direct Research Journal of Health and Pharmacology
Vol. 11(1) Pp. 11-20, January 2024
ISSN: 2449-0814
DOI: https://doi.org/10.26765/DRJHP92487108
Article Number: DRJHP92487108

https://journals.directresearchpublisher.org/index.php/drjhp

Knowledge and attitudinal dispositions as factors associated with self-medication in malaria treatment modality among selected parents and child care-givers in Nigeria

Odis Adaora Isabella[1], Ogbenna Ann[2], Adesina Adefunke Oyeniyi[3], and Okafor Ukamaka[4]

[1]Fellow on Covid-19 Recovery for Routine Immunization Program, Lagos, Nigeria.
[2]Senior Lecturer/Consultant Hematologist, College of The Medicine University of Lagos, Nigeria.
[3]Public Health Physician/Field Epidemiologist, Lagos State Ministry of Health/Nigeria Field Epidemiology and Laboratory Training Program.
[4]Director Lagos Zonal Office, Pharmacy Council of Nigeria.
Corresponding Author E-mail: arisdobel@yahoo.com

Received 5 December 2023; Accepted 17 January 2024; Published 22 January 2024

ABSTRACT: Self-medication with malaria drugs is becoming increasingly common due to multiple factors. The aim of this study was to assess the level of knowledge, attitudinal dispositions, on respondents on the use of self-medication with malaria drugs in Nigeria. The study design was a cross-sectional descriptive study. An online survey was conducted between July and August 2023 using a semi-structured questionnaire. Data were collected with kobotoolbox Forms. A total of 399 respondents participated in the study, with a mean age of 43.52 years (± 10.90) years. Majority of the respondents were young adults between the age ranges of 34 - 44 years. Coartem (68.7%) was most used by the study respondents. Doctor's and Pharmacist's prescription for the respondents were 50.9% and 54.40%, respectively. 96.2% of the respondents complied with the duration of the use of the malaria drug, 68.90% reported that they had no side effects and 34.8% stated that the malaria drug was effective to resolving their illness. The respondents indicated that 25.30% and 21.10% have taken malaria drugs once and twice, respectively, between September 2022 and August 2023. Convenience (58.60%), Cost saving (23.60%), Long delays in hospital (23.10%), and attitude of hospital staff (6.3%) were mostly the reasons why the study respondents were involved in self- medicating with malaria drugs. 96.2% of respondents said they completely understood the instructions for the malaria medications they used to self-medicate. More than half of the respondents (53.9%) sometimes sleep under the mosquito net, 32.6% has never sleep under mosquito net, and this is not a good public health practice given that malaria is a deadly disease. WHO recommends that the public should sleep under insecticide treated mosquito nets, especially pregnant women and children.We recommend in this study that the use of media to discourage the masses from self-medication with malaria drugs.

Keywords: Malaria, malaria drugs, self-medication, Nigeria

Citation: Odis, A. I., Ogbenna, A., Adesina, A. O., and Okafor, U. (2024). Knowledge and attitudinal dispositions as factors associated with self-medication in malaria treatment modality among selected parents and childcare-givers in Nigeria. Direct Res. J. Health Pharm Vol. 11(1), Pp. 1-20. https://doi.org/10.26765/DRJHP92487108. This article is published under the terms of the Creative Commons Attribution License 4.0.

INTRODUCTION

Globally, malaria remains one of the most severe public health problems. It is a serious illness which can be fatal if not promptly treated. According to USCDC, the direct estimated cost of malaria is about 12 million US dollars annually (CDC, 2021). Multiple *Plasmodium* species cause malaria, including *P. falciparum*, which is really

prevalent in Africa, and *P. vivax*, prevalent in some areas of Asia and Latin America. *P. vivax* is one of the two known *Plasmodium* species that can be found in the liver, springing up periodically to cause illness after a very long time from the infectious mosquito bite (Crutcher and Hoffman, 1996). There are interventions like anti-malaria drugs, bed nets and insecticides that have helped to mitigate the burden of malaria in the past decade, even though malaria remains a leading cause of morbidity and mortality in children below the age of 5 years (University of Oxford, 2021).

In 2021, nearly half of the world's population was at risk of malaria, that year, there were an estimated 247 million cases of malaria worldwide and the estimated number of malaria deaths stood at 619 000 in 2021(WHO, 2023). The WHO African Region carries a disproportionately high share of the global malaria burden. In 2021, the Region was home to 95% of malaria cases and 96% of malaria deaths. Children under 5 accounted for about 80% of all malaria deaths in the Region (WHO, 2023). Most deaths are amongst children in Africa were very high transmission rates are found in many countries (WHO, 2021). Previous studies in sub-Saharan Africa have found that malaria is seen as a major public health problem (WHO, 2022). Nigeria accounts for 32.3% of global malaria deaths (WHO, 2023). In 2021, the estimated number of cases was 68 million with 194000 deaths (WHO, 2023).

Self-medication is when someone uses a substance or drugs to treat self-recognized disorders or symptoms without the prescription from a Physician. Taking medication without Doctor's prescription can be dangerous which can lead to addiction or dependence on the substance (Gateway foundation, 2023). Self-medication is a threat to global health because of the emergence and spread of drug- resistance all over the world especially in Africa where malaria is highly prevalent.

Over the last decade, partial artemisinin resistance has emerged as a threat to global malaria control efforts in the Greater Mekong sub-region, WHO is very concerned about recent reports of partial artemisinin resistance in Africa, confirmed in Eritrea, Rwanda and Uganda (WHO, 2023). Regular monitoring of anti-malaria drug efficacy is needed to inform treatment policies in malaria-endemic countries, and to ensure early detection of, and response to, drug resistance (WHO, 2023). Anti-malaria drug failures have been reported anecdotally in Nigeria, and malaria self-treatment practices could be a contributing factor (Oluwayemi et al., 2023).

Self-medication practice is very common in many other African countries. Its frequency was 91.4% among students in southwestern Nigeria in 2012 (Osemene and Lamikanra, 2012), 81% in the northern district of Dakar in Senegal in 2006 (Ndiaye et al., 2006), 65% in Libreville, Gabon (Perret and Ngomo, 1993), 64.5% in Ethiopia in 2003 (Deressa et al., 2003) and 55.7% in Cameroon in 2011 (Nsagha et al., 2011).

In a research conducted in Ibadan, Nigeria, 69% of caregivers self-prescribed and self-managed malaria for children under 5 years old without immediate hospital visits, and 76.4% of the caregivers believed the most recommended and available anti-malaria drugs were ineffective (Oluwayemi et al., 2023). Oluwayemi et al. (2023) also found out that, 44.2% of respondents preferred and used antibiotics as a treatment strategy for malaria, 13.2% used agbo (a locally made liquid extract of plants and roots), 12.5% used prayers, 19.6% used anti-malaria drugs and 57.1% of respondents stated that they always complete the standard anti-malaria dosage regimen (Oluwayemi et al., 2023).

Another similar study from the Republic of Benin stated that (42.09%) had self-medicated including (38.81%) with anti-malaria drugs, fever was the main symptom of malaria reported by respondents (38.51%) followed by headache (27.76%) (Attinsounon et al., 2019). The most commonly used anti-malarial drugs for self-medication in Republic of Benin were quinine (44.45%) followed by artemisinin-based combination therapy (34.07%), eighty-seven respondents (66.92%) did not have a good knowledge of the drug dosage and the reasons for self-medication in Republic of Benin were mainly the high cost of consultation fees (54.10%) and good knowledge of one's illness (28.96%) (Attinsounon et al., 2019). Self-medication-associated factors in Republic of Benin were fever ($p = 0.04$), non-prescription drugs supply in pharmacies ($p < 0.01$), drugs supply in the informal market ($p < 0.01$), previous satisfactory use of the drug ($p < 0.01$), drug cost availability ($p = 0.03$) and drug recommendation by a relative or friend ($p = 0.02$) (Kojom et al., 2018).

Research conducted in Cameroon found out that the prevalence of self-medication was 49.30% (Kojom et al., 2018). The main reasons Cameroonians gave for self-medication were "habit" (38.75%), "Lack of money" (22.48%) and "Lightness of symptoms" (13.18 %). Pharmacy (47.80%) and street medicine stores (30.19%) were the commonest drug providers and age, level of education and curiosity about treatment were risk factors of self-medication (Kojom et al., 2018). A study from Tanzania stated that the prevalence of anti-malaria self-medication was (69.6%), the majority of the respondents (83.1%) reported that they did not get better after medication and about 36% of the respondents mentioned time taken in health facilities as the main factor for self-medication (Mwita et al., 2019).

A study from Congo stated that self-medication has a prevalence of 99%, with 82.4% of subjects who practice self-medication in the event of malaria, and 79.4% use quinine as the drug for self-medication (Akilimali et al., 2022).

A study from Enugu, Nigeria discovered that 91.6% had self-medicated with anti-malaria drugs and the most common symptom for which anti-malaria drugs were

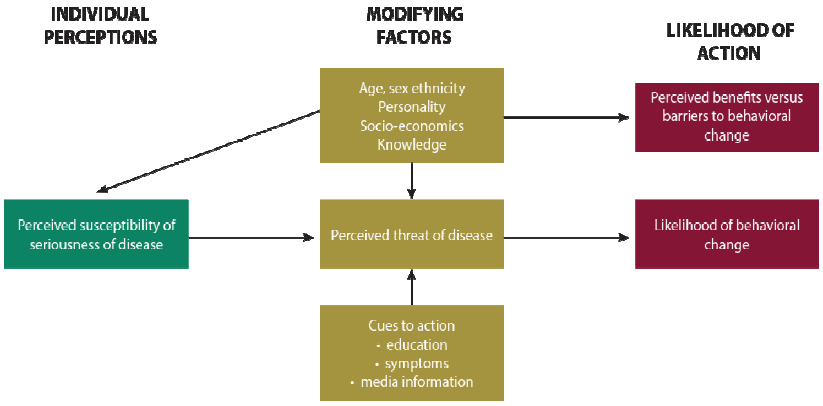

Figure 1: Health belief model by USAID and PMI.

used for self-medication was fever (Ayogu et al., 2021). Iribhogbe and Odoya, (2020) reported that self-medication practice with anti-malaria among postpartum mothers both for themselves and their newborn child was 42.7% and 22.7% respectively. One of the reasons adduced for such practice was that malaria was expensive to treat (37, 24.7%), Artemether/lumefantrine combination was the most commonly used drug for treatment (75.3%), and most of the participants preferred parenteral medication (68%) to oral drugs (Iribhogbe and Odoya, 2020).

The Health Belief Model, social learning theory, self-efficacy, and loss of control have all been applied with varying success to problems of explaining, predicting, and influencing behavior (Rosenstock et al., 1988). The Health Belief Model above highlights how programs need to consider individual beliefs about the problem being addressed, and the costs and barriers associated with changing a behavior (Johns Hopkins University, 2017). The Health Belief Model is best used when promoting individual preventive behaviors, such as vendor or consumer purchasing or verification practices (Johns Hopkins University, 2017). It focuses on the beliefs and perceptions of the individual, so it is appropriate to change behaviors that are not heavily influenced by society and social norms (Figure 1). It tells us the importance of highlighting both the negative consequences of the current behavior and the positive consequences of alternative, suggested behavior (Johns Hopkins University, 2017).

Aim

The aim of the study was to evaluate the knowledge, attitudinal dispositions, and use of self-medication with malaria drugs in Nigeria.

Specific objectives

a) To examine the level of knowledge, use of malaria drugs.
b) To find out the frequency and reasons of Self-medication with malaria drugs among Nigerians.
c) To examine the association of socio-cultural factors with self-medication with malaria drugs.

Research questions

What are the multiple factors that lead to or result to increase of self – medication with malaria drugs?

Assumptions

The assumption in this study is that there is the probability of self-medication with malaria drugs, the effectiveness of malaria drugs, lack of knowledge, and cost that leads to increased self-medication with malaria drugs.

METHODOLOGY

Study design

A descriptive cross-sectional study was carried out to assess the attitudinal dispositions, knowledge of malaria, malaria drugs and reason for self-medication with malaria drugs among parents/child care giversin Nigeria (online population based).

Selection of the study population

The study populations were parents/childcare givers/Guardians that vaccinate their children and live in Nigeria (online population based).

Sample size determination

Using the Cochrane algorithm (Araoye, 2003), the sample size was found to have 95% confidence limits of 5% maximum error of the estimate when the probability of self-medication with anti-malaria among postpartum women for themselves was 42.7% (Iribhogbe and Odoya, 2020). This necessitates the presence of 377 Nigerian residents. After cleaning the data gathered, 399 participants totally filled out the kobotoolbox questionnaires for the study in the aforementioned time period (July - August 2023) using convenience sampling.

Sampling technique

This research utilized convenience sampling, a nonprobability sampling method, to select data from easily accessible individuals through an online survey questionnaire.

Data collection

The questionnaire for this study was created based on past research questions about malaria and malaria drugs. A pilot study of 20 Nigerian citizens with children was conducted, and appropriate revisions were made. The questionnaire has three sections. The first was the demographic section, which asked about age, gender, marital status, educational level, household income, employment status, and health insurance. The second category included the various malaria medications that the participants purchased for self-administration. The third category included the reasons for and frequency of self-medication, the area where malaria medications could be obtained, and the persons they sought assistance from. While sharing the questionnaire online, the primary investigator presented the study to the participants, including the conditions for participation and the privacy and confidentiality of data collection. Although the study had no severe ethical difficulties, the researcher created a participant information sheet that detailed the study's voluntary nature as well as its anonymity and secrecy.

Data analysis

511 participants completed the koboboxtool questionnaire; 12 submitted blank forms, and 100 did not complete all questions; we needed 377 participants, and we received n = 399 after cleaning up the data. The data was initially summarized using descriptive data analysis. The outcome of interest was to learn about their knowledge of malaria and malaria drugs, attitudinal dispositions and self-medication with malaria medications. The data collected was analyzed using GNU PSPP. Second, a linear regression model was used to examine the relationship between high hospital care costs, potential multiple factors or significant determinants that are challenging to measure and quantify, such as convenience, lack of health insurance, insufficient time to visit the hospital, hospital staff attitude, and self-medication with malaria drugs. The significance level (alpha) was established at 0.05.

Ethical considerations

Ethical approval was obtained from the Research and Ethics Committee of Lagos University Teaching Hospital before the commencement of the study. The ethical approval number is ADM/DSCST/HREC/APP/5956. Participation was voluntary, all the participants were required to provide written informed consent and they were assured of the confidentiality regarding information collected from them.

RESULTS

The results of the study are divided into four sub–sections, namely: Socio-demographic characteristics of respondents, the different malaria drugs that the participants bought for self-administration, the reasons for self-medication and its frequency, the location for obtaining malaria drugs, and the people they approached for advice.

Socio-demographic data

52.6% of respondents were female, and 47.4% were male. The majority of respondents (77.7%) were married, compared to 20.3% who were single and 1% who were split or divorced. Muslims made up 11.80% of parents and guardians, while Christians made up the majority (87.7%). A significant proportion of the respondents (67.2%) were employed, with about 28.1% being self-employed and 4.8% being unemployed (Figure 2 and Table 1).

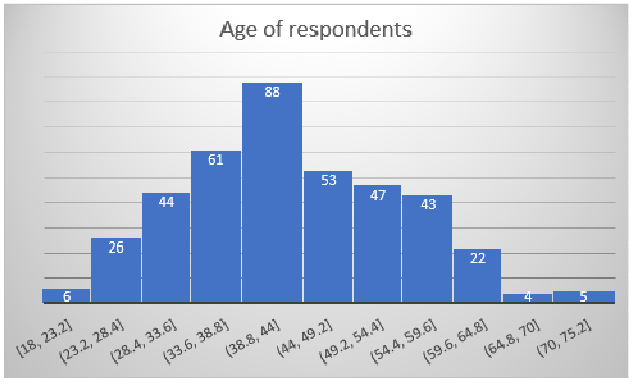

Figure 2: Socio-Demographic Data

The mean, modal ages, and standard deviation of respondents,

Table 1: Socio-demographic Characteristics of Respondents.

	Frequency n = 399	Percentage (%)
Sex of respondent		
Male	189	47.4
Female	210	52.6
Marital Status		
Single	81	20.3
Married	310	77.7
Divorced	4	1.0
Separated	4	1.0
Education		
No formal education	0	0
Primary	0	0
Secondary	3	0.8
Tertiary	396	99.2
Religion		
Christian	350	87.7
Islam	47	11.8
Others	2	0.5
Employment Status		
Employed	268	67.2
Unemployed	19	4.8
Self employed	112	28.1
Income		
<50,000 Naira	35	8.8
50,000 – 99,999	63	15.8
100,000 – 150,000	38	9.5
>150,000	263	65.9
Health Insurance status		
Yes	210	52.6
No	189	47.4
Have you ever taken malaria drugs?		
Yes	396	99.2
No	3	0.8
Have you ever treated yourself (self-medicated) with malaria drugs?		
Yes	383	96
No	16	4

were 43.52 years, 39years old, and 10.90. The youngest respondent was 18 years old, and the oldest respondent was72years old and range was 54 years old (Figure 2). The majority of respondents (67.2%) had tertiary education, while 0.8% had secondary education. Of those surveyed, 65.9% earned more than Naira 150,000 per month, 15.8% earned between Naira 50,000 and Naira 99,999, 9.5% earned between Naira 100,000 and Naira 150,000, and 8.8% earned less than Naira 50,000 per month. More than half of respondents (52.6%)have health insurance, while only 47.4% of respondents do not have health insurance, 99.2% of the respondents have taken malaria drugs, while0.8% have not taken malaria drugs before. Majority of the respondents (96%)have self-medicated with malaria drugs, while4% do not self-medicate with malaria drugs.

Different malaria that the Participants Bought for Self-administration

The reasons for self-medication and its frequency, the location for obtaining malaria drugs and the people they approached for advice

Regarding how frequently they use malaria medication, the majority of respondents (58.9%) fell into the "others" category, whereas 23.8% use it every three months (Table 3). 50.9% of the respondents had a prescription from a doctor, and 54.40% had one from a chemist; 47.9% of them had a prescription for the malaria medication themselves. The two locations where the respondents buy the malaria medications they use for self-medication are pharmacies (63.9%) and patent medicine stores (31.8%). It was astounding that 96.2% of respondents followed the recommended dosage for the malaria medication, which is commendable. Additionally, 68.90% of respondents said they experienced no adverse effects, while 31.10% reported experiencing some. Remarkably, 51.60% of respondents were satisfied with

Table 2: Different malaria that the participants bought for self-administration

Name of Malaria drug	Frequency n = 399	Percentage (%)
Coartem	274	68.7
Lonart	265	66.4
Amatem_forte	241	60.4
P–Alaxin	161	40.4
Artesunate	154	38.6
Camosunate	137	34.3
Lokmal	97	24.3
Fansider	90	22.6
Artequick	88	22.1
Chloroquine	80	20.1
Artequin	56	14.0
Primaqunie	13	3.3
Quindine	11	2.8
Atovaquone	7	1.8
Others	33	8.3

Coartem (68.7%), Lonart (66.4%),Amatem_forte (60.4%), P – Alaxin (40.4%), Aretesunate (38.6%), Camosunate (34.3%), Lokmal (24.3%), Fansider (22.6%), Artequick (22.1%), Chloroquine (20.1%), Artequin (14.0%)are the malaria drugs our respondents used most for Self – medication (Table 2).

Table 3: The reasons for self-medication and its frequency, the location for obtaining Malaria drugs.

Questions	Frequency n = 399	Percentage (%)
What is your frequency of malaria drug use?		
Weekly	1	0.3
Monthly	18	4.5
Once in two months	50	12.5
Every 3 months	95	23.8
Others	235	58.9
Who prescribed the malaria drugs? (Multiple answers)		
Doctor	203	50.9
Nurse	33	8.3
Pharmacist	217	54.4
My self	191	47.9
Others	17	4.3
Place of malaria drugs purchase (Multiple answers)		
Pharmacy	255	63.9
Patent Medicine store	127	31.8
Local drug hawkers	1	0.3
Others	84	21.1
Did you comply with the duration of use of malaria drugs?		
Yes	384	96.2
No	15	3.8
Were there any side effects?		
Yes	124	31.1
No	275	68.9
Was the malaria drugs effective in resolving the illness?		
Excellent	139	34.8
Good	53	13.3
No results	1	0.3
Satisfactory	206	51.6
How many times did you treat yourself with malaria drugs in the past one year		
Nil	45	11.3
Once	101	25.3
Twice	84	21.1
Thrice	73	18.3
Four times	47	11.8
Five times	18	4.5
Six time	14	3.5
More than six times	15	4.4

Table 3 contd.

What were your reasons for self – medication with malaria drugs?(Multiple answers)	Frequency n = 399	Percentage (%)
Cost	94	23.6
Convenience	234	58.6
Lack of trust or confidence in prescribing Doctor	17	4.3
Attitude of hospital staff	25	6.3
No hospital near me	10	2.5
Long delays in hospital	92	23.1
It's cheaper	65	16.3
Others	105	26.3
How much did you understand the instructions?		
Fully understood	384	96.2
Partly understood	15	3.8
Have you ever found out that you had taken the same malaria with different names at the same time?		
Yes	81	20.3
No	318	79.7
How many different malaria drugs did you take for a single illness		
1 malaria drug	296	74.0
2 malaria drugs	72	18.0
3 malaria drugs	8	2.0
4 malaria drugs	23	6.0

the malaria drug's ability to resolve their disease, while 34.8% of respondents said it was effective in doing so (Table 3).

According to the respondents, between September 2022 and August 2023, 25.30% and 21.10%, respectively, had taken malaria medications once. Notably, 11.30% of respondents did not take anti-malarial medication in the previous year. Convenience (58.60%), cost savings (23.60%), lengthy hospital delays (23.10%), and hospital staff's attitude (6.3%) were the main causes of the respondents' self-medication for malaria.

Ninety-six percent of the respondents said they understood the instructions on the malaria medications they self-medicated. When they were ill, the majority of the respondents (74.20%) took only one type of malaria medication, followed by 18% who took two types, 2% who took three types, and 6% who took four types. Twenty percent of the respondents discovered that they had taken the identical malaria medications under different names at the same time.

Malaria symptoms, the People they approached for advice and use of ITN

For fever (71.40%), malaria (66.7%), aches and pains (56.9%), vomiting (5.0%), and infection (1.50%), the respondents self-medicated with malaria medications (Table 4). The selection of malaria treatments by the respondents was based on their personal experience and knowledge of the disease (62.2%), as well as recommendations from community chemists (41.4%), doctors (29.8%), previous doctors' prescriptions (23.13%), and nurses (9.8%). 33.8% of the respondents stopped taking the malaria medication when it ran out or was finished, 1.8% quit after a few days regardless of the outcome, and 67.9% of the respondents ceased taking the medication after the course was completed, a few days after recovery (5.3%), and after symptoms subsided (11.3%). Only 13.5% of respondents consistently sleep beneath a mosquito net, compared to more than half (53.9%) who do so occasionally. Of those who responded, 32.6% had never slept in treated mosquito net.

DISCUSSION

The major findings from the study are divided into four subsections namely: Socio-demographic characteristics of respondents, the different malaria drugs that the participants bought for self - administration, the reasons for self-medication and its frequency, the location for obtaining malaria drugs, and the people they approached for advice.

The demographics study showed that there was a greater number of young adults that responded to the attitude, knowledge and use of self-medication with malaria drugs survey. There was a slightly symmetrical distribution of gender respondents which was akin to findings obtained from a similar study which showed a slightly greater proportion of the female respondent (Odis, 2021). Majority of the respondents interviewed with advanced Knowledge and exposure was about 99.2% while 0.8% had secondary education. The study further shows that the majority of the respondents with health insurance accounted for was 52.6% which is a little higher than non-health insurance holders unlike a similar study (Odis, 2021) where respondents with health insurance accounted for were 33.83%than non-health insurance holders.

Majority of the respondents (96%) have self-medicated with malaria drugs, Self-medication practice is very

Table 4: Malaria symptoms, the People they approached for advice and use of ITN.

	Frequency n = 399	Percentage (%)
For which of the following complaint(s) did you use malaria drug?(Multiple answers)		
Fever	285	71.4
Aches and pains	227	56.9
Vomiting	20	5.0
Infection	6	1.5
Stomach pains	22	5.5
Malaria	266	66.7
Others	29	7.3
Your selection of malaria drug was based on? (Multiple answers)		
Recommendation by community pharmacists	166	41.6
Opinion of family members	38	9.5
Opinion of friends	21	5.3
My own experience and Knowledge of malaria drugs	248	62.2
Recommendation by local hawkers	2	0.5
Previous doctor's prescription	92	23.1
The advertisement	18	4.5
Recommendation by a Doctor	119	29.8
Recommendation by a Nurse	39	9.8
When did you normally stop taking malaria drug?		
After a few days regardless of the outcome	7	1.8
After symptoms disappeared	45	11.3
A few days after the recovery	21	5.3
After malaria drug finished	135	33.8
At the completion of the course	271	67.9
After consulting a doctor/pharmacist	14	3.5
Do you sleep under insecticides treated mosquito nets?		
Always	54	13.5
Sometimes	215	53.9
Never	130	32.6

common in many other African countries. It's frequency was 91.4% among students in south western Nigeria in 2012 (Osemene and Lamikanva, 2012), 81% in the northern district of Dakar in Senegal in 2006 (Ndiaye, et al., 2006), 65% in Libreville, Gabon (Perret and Ngomo, 1993), 64.5% in Ethiopia in 2003 (Deressa, Ali, and Enqusellassie, 2003) and 55.7% in Cameroon in 2011 (Nsagha et al. 2011). Coartem (68.7%), Lonart (66.4%), Amatem_forte (60.4%), P – Alaxin (40.4%), Aretesunate (38.6%), Camosunate (34.3%), Lokmal were the common malaria drugs the respondents bought for self-medication. While the most commonly used anti-malaria drugs for self-medication in Republic of Benin were quinine (44.45%) followed by artemisinin-based combination therapy (34.07%) (Attinsounon, Sissinto, Avokpaho, et al, 2019).And in another study conducted in Nigeria Artemether/lumefantrine combination was the most commonly used drug for treatment (75.3%) (Iribhogbe and Odoya, 2020).

The place of Purchase of malaria drugs the respondents use for Self – medication was Pharmacy (63.9%) which is different from a similar study where respondents use for Self – medication were Local chemist (46.27%) and Patent Medicine stores (41.79%) (Odis, 2021)While in Cameroon, Pharmacy (47.80%) and street medicine stores (30.19%) were the commonest drug providers Kojom et al., 2018).The respondents indicated that 25.30% and 21.10% have taken malaria drugs once and twice, respectively, between September 2022 and August 2023. It is worthy to note 11.30% didn't take malaria drugs in the last one year. The respondents self-medicated with malaria drugs for Fever (71.40%) which is similar to other findings from many researchers (Attinsounon et al, 2019; Ayogu et al., 2021).

Convenience (58.60%), Cost saving (23.60%), Long delays in hospital (23.10%), and attitude of hospital staff (6.3%) were mostly the reasons the respondents were self- medicating with malaria drugs, this sis similar to other self-medication research (Odis, 2021). However cost (Iribhogbe and Odoya, 2020) and time spent in the hospital (Attinsounon et al, 2019) **(**Mwita et al., 2019) were reported by other researchers.

Respondent's selections of malaria were based on their own experience and knowledge of malaria drugs (62.2%), recommendation by community Pharmacist (41.4%), Recommendation by a Doctor (29.8%), Previous Doctor's prescription (23.13%) which is slightly different from a self-medication with antibiotics study (Odis, 2021).While in some studies Self-medication associated factors in Republic of Benin were fever($p = 0.04$), non- prescription

drugs supply in pharmacies ($p < 0.01$), drugs supply in the informal market ($p < 0.01$), previous satisfactory use of the drug ($p < 0.01$), drug cost availability ($p = 0.03$) and drug recommendation by a relative or friend ($p = 0.02$) (Attinsounon et al., 2019).

More than half of the respondents (53.9%) sometimes sleep under the mosquito net, 32.6% has never slept under mosquito net, and this is not a good public health practice given that malaria is a deadly disease. The WHO recommends sleeping under mosquito net and prevention is better than cure (WHO, 2021). The results of the study shows that high cost of hospital care plus other multiple factors like convenience, and lack of health insurance, lack of time to visit the hospital and attitude of hospital staff determine causes of self – medication with malaria drugs and gives rise to self-medication with malaria drugs $p < 0.05$.

Recommendation

a) There is pressing importance for public health agencies, professionals, and the Federal Ministry of Health in Nigeria to enforce existing laws on malaria drug sales by Pharmacies, drug hawkers and enlighten the people on the dangers of self-medication.

b) The Public should ensure that they sleep under insecticide treated mosquito nets especially children and pregnant women.

c) WHO has recommended the use of mosquito repellents (containing DEET, IR3535 or Icaridin) after dusk, use coils and vaporizers, wear protective clothing and use window nets.

d) We recommend the use of media (television, radio, newspaper, magazine, billboards, Facebook, Twitter, Instagram, Linkedin, Telegram, TikTok, Threads, Whatsapp etc.) to encourage the masses to use insecticide treated mosquito nets.

e) Leaders at all levels should be involved in public health education on importance of enrolling to the National Health Insurance scheme or State insurance scheme like Anambra state health insurance scheme.

Limitations

This study has its limitations which cannot be overlooked; like those that have access to internet, those that belong to the media platforms where the survey link was shared, a particular age group like young parents or guardian or child care givers that vaccinate their children residing in Nigeria. However the authors made efforts to ensure widespread sharing of the study link.

ACKNOWLEDGEMENT

We would like to express our gratitude to Mr. Isaac Adedeji and Mr. Janson Solomon for their contribution and hard work.

Conflicts of interest

The authors declare no conflict of interest.

REFERENCES

Akilimali, Aymar , Charles Bisimwa, Abdullahi Tunde Aborode, Chrispin Biamba, Leonard Sironge, Alain Balume, Rahma Sayadi, Samuel Babatunde Ajibade, Akintola Ashraf Akintayo, Tolulope Olamide Oluwadairo, Emmanuel Adebowale Fajemisin,(2022). Self-medication and Anti-malarial Drug Resistance in the Democratic Republic of the Congo (DRC): A silent threat https://tropmedhealth.biomedcentral.com/articles/10.1186/s41182-022-00466-9

Araoye, M.O. (2003). Research methodology with statistics for health and social sciences, First edition Nathadex Publisher Ilorin Nigeria. Page 119.

Attinsounon, Cossi Angelo , Yollande Sissinto, Euripide Avokpaho, Adébayo Alassani, Majid Sanni, Marcel Zannou, (2019). Self-Medication Practice against Malaria and Associated Factors in the City of Parakou in Northern Benin: Results of a Population Survey in 2017.

Ayogu, Ebere E., Aluh, Deborah O., Igboeli, N. U. (2021). Self-medication with antibiotics and anti-malarial drugs among rural dwellers in Enugu State, Nigeria, https://www.psnnjp.org/index.php/home/article/view/82.

CDC, (2021). Malaria's Impact Worldwide

Crutcher JM, Hoffman SL. Malaria. In: Baron S, editor. Medical Microbiology. 4th edition. Galveston (TX): University of Texas Medical Branch at Galveston; (1996). Chapter 83. Available from: https://www.ncbi.nlm.nih.gov/books/NBK8584/

Deressa, W., Ali, A. and Enqusellassie, F. (2003). Self-Treatment of Malaria in Rural Communities, Butajira, Southern Ethiopia. Bulletin of the World Health Organization, 81, 261-268.

Gateway foundation, (2023), Dangers of Self-Medication.

Iribhogbe, O. I., Odoya, E.M. (2020). Self-medication practice with anti-malaria & the determinants of malaria treatment-seeking behavior among postpartum mothers in a rural community in Nigeria. https://onlinelibrary.wiley.com/doi/10.1002/pds.5178

Johns Hopkins University, (2017). Quality-malaria-medicines: health-belief-model https://sbccimplementationkits.org/quality-malaria-medicines/health-belief-model/

Kojom, L. P. F. , Ntoumba, A. A. , Nyabeyeu, H., Bunda Wepnje, G. , Tonga, C. Lehman, L. G. (2018). Prevalence, patterns and predictors of self-medication withanti-malaria drugs among Cameroonian mothers during a recent illness episode http://dx.doi.org/10.4314/jmbs.v7i1.4

Mwita, Stanley, Meja, Omary, Katabalo, Deogratias and Richard, Catherine (2019). Magnitude and factors associated with anti-malaria self-medication practice among residents of Kasulu Town Council, Kigoma-Tanzania https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7040277/

Ndiaye, P., Tal-Dia, A., Diedhiou, A., Juergens-Behr, A. and Lemort, J. (2006). L'automédication de la fièvredans le district nord de Dakar au Sénégal. MedecineTropicale, 66, 74-78.

Nsagha, D.S., Njunda, A.L., Kamga, H.L.F., Nsagha, S.M., Assob, J.C.N., Wiysonge, C.S. (2011). Knowledge and Practices Relating to Malaria in a Semi-Urban Area of Cameroon: Choices and Sources of Anti-malaria, Self-Treatment and Resistance. Pan African Medical Journal, 9, 8. https://doi.org/10.4314/pamj.v9i1.71180 http://www.panafrican-med-journal.com/content/article/9/8/full/

Odis, A. I. (2021). Attitude, Knowledge, and Use of Self–Medication with Antibiotics by Outpatients of Gbagada General Hospital Gbagada Lagos.

Oluwayemi J. Bamikole, Taiwo H. Olajide, Babajide A. Adedeji, Subulade A. Ademola, Ayorinde F. Fayehun, Noah O. Bukoye, Miles-Dei B. Olufeagba, Olukemi K. Amodu, (2023). Drug Use Practices and Self-Treatment for Suspected Malaria in Ibadan, Nigeria, https://www.ajtmh.org/view/journals/tpmd/108/6/article-p1122.xml

Osemene, K. and Lamikanra, A.(2012). A Study of the Prevalence of Self Medication Practice among University Students in Southwestern Nigeria. Tropical Journal of Pharmaceutical Research, 11, 683-689. https://doi.org/10.4314/tjpr.v11i4.21

Perret, J. and Ngomo, M. (1993). Auto-médication antipalustre chez les adultes consultant pour fièvre au Centre hospitalier de Libreville. Médecined' Afrique Noire Electronique, 40, 522-524.

Rosenstock, I. M., Strecher, V. J., & Becker, M. H. (1988). Social learning theory and the Health Belief Model. *Health Education Quarterly, 15*(2), 175–183. https://doi.org/10.1177/109019818801500203.

University of Oxford, (2021). Malaria vaccine becomes first to achieve WHO-specified 75% efficacy goal

WHO, (2021). WHO recommends groundbreaking malaria vaccine for children at risk,

WHO, (2022).Learning lessons from the pilots: overcoming knowledge gaps around the malaria vaccine schedule in support of vaccine uptake,https://www.who.int/news-room/feature-stories/detail/learning-lessons-from-the-pilots--overcoming-knowledge-gaps-around-the-malaria-vaccine-schedule-in-support-of-vaccine-uptake

WHO, (2023). Malaria,https://www.who.int/news-room/fact-sheets/detail/malaria

WHO, (2023). Report on malaria in Nigeria (2022).