

**International Journal of TROPICAL DISEASE  
& Health**  
4(5): 517-529, 2014



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## **Perception and Home Management of Malaria in Rural Communities in Imo State, Nigeria**

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### **Authors' contributions**

*This work was carried out in collaboration between all authors. Author EAN designed the study. Author CICE performed the statistical analysis. Author SNOI wrote the protocol. Authors EAN, UMC and BON wrote the first draft of the manuscript. Authors CICE and SNOI managed the analyses of the study. Authors EAN and UMC managed the literature searches. All authors read and approved the final manuscript.*

**Original Research Article**

**Received 22<sup>nd</sup> December 2013**  
**Accepted 1<sup>st</sup> February 2014**  
**Published 23<sup>rd</sup> February 2014**

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### **ABSTRACT**

**Aims:** The objectives were to determine the rural communities' knowledge on cause, transmission, spread of malaria, breeding sites of mosquitoes, signs and symptoms, health seeking behaviour of respondents, preventive measures and patterns of home management of malaria in the rural communities in Imo State.

**Study Design:** A descriptive survey design was used.

**Place and Duration of Study:** Imo State, Nigeria, between February 2013 and April 2013.

**Methodology:** The sample size was 2674 adults (1650 males, 1024 females, age range 20-70 years). A structured, validated and reliable questionnaire ( $r = 0.81$ ) and focus group discussion were used as instruments for data collection.

**Results:** The result showed that out of 2674 respondents, 1683(62.9%) reported that malaria is transmissible while 976(36.5%) reported that malaria is not transmissible. Majority 2262(84.6%) noted that malaria spreads through mosquito bite while insignificant number said malaria spreads through drinking dirty water and eating unhygienic food. 1501(56.1%) noted that stagnant dirty water is a common breeding site for mosquitoes.

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Most of the respondents had good knowledge of the signs and symptoms of malaria which was used in prompt diagnosis. Majority 41% first patronized medicine stores followed by 38.5% that visited the hospital and health centers. In terms of preventive measures practiced by respondents, the majority 1049 and 1028 used mosquito bed nets and insecticide spray respectively while 237 used firewood smoke to drive mosquitoes away. In the pattern of home management of malaria, 62.3% used anti-malaria drugs, 10.5% used a special herb, *Azadirachta indica* (dogonyaro/Akum shut up leaf), 6.9% used combination of seven leaves (Pawpaw, mango, guava, Nchuanwu (*Occimum basilicum*) and awolowo leaf (*Chromolaena odorata*), orange and lemon grass) While 6.0% used prayers to God.

**Conclusion:** Based on the above results and to keep abreast with the conventional practice, the rural communities require health education on home management of malaria.

*Keywords: Perception; home management; malaria; rural communities; Imo State.*

## 1. INTRODUCTION

Home management of malaria is the care of malaria that is done at the patients' home through family participation within available resources sometimes in collaboration with health care workers. It is the care at home with what is available at hand (herbs, drugs from shops and tepid sponging) and then shifted to the health workers if there is no response or if the situation has worsened [1]. Many episodes of malaria are currently treated outside the formal health system, often with inappropriate or incorrectly used drugs. Most household care givers begin treatment of malaria with anti-malarial drugs which are usually purchased over the counter from drug sellers without prescription and usually without appropriate doses. This is particularly common in rural and remote populations where the right perceptions about the disease are low and contributes both to worsening morbidity patterns and increased drug resistance [2].

Malaria has continued to be a major public health problem being responsible for an estimated 350 to 500 million people being affected every year in Africa and approximately one million people die [3]. According to annual report on National Malaria Control Committee Programme in Nigeria [4], the financial loss due to malaria is estimated to be 132 billion naira in form of treatment cost, prevention and loss of man hours. Furthermore, the report of [5] on Nigeria malaria fact sheet noted that malaria has the greatest prevalence, close to 50% in children age 6-59 months in the south west, north central and north west regions and malaria is also the third leading cause of death for children under five years worldwide, after pneumonia and diarrhoeal disease.

A wide variety of anti-malaria drugs are available to treat malaria. In the last five years, treatment of malaria caused by *Plasmodium falciparum* infections in endemic countries has been transformed by the use of combinations of drugs containing an artemisinin derivative (ACT). Severe malaria is treated with intravenous or intra muscular quinine or increasingly, the artemisinin derivative artesunate [6]. Also fight malaria at home with a new drug (known as OMARIA, which is a non-alkaloid) that offers a paradigm shift has been reported in India [7-11] and it has also been in-vitro evaluated in Gabon, Africa [5]. Home management as a donor driven programme with existing conventional drugs is also noted in Ethiopia [www.Fighting malaria at home; Ethiopia\Africa](#) and in other regions of the world [Personal communication]. We report about 'home management of malaria' using traditional methods

and cultural practices from Nigeria (a tropical hot bed of African resistant and polymorphic malaria).

Prompt treatment with effective antimalarial therapy is essential and African leaders were committed to ensuring that 80% of malaria episodes are adequately treated within 24 hours of onset of symptoms by 2010. But 3 years after the situation remains largely the same. Treatment of malaria is challenged by factors which include inadequate health-care infrastructure in many parts of Africa. Health facilities are often resource-limited, and access to care may be limited by distance, fees, inadequate staffing, and lack of essential medicines. The direct and especially indirect costs of seeking health care from formal facilities may be substantial, providing a major barrier for many households. These have led to febrile illnesses being commonly treated at home, frequently with drugs purchased from drug shops. According to [12], it is estimated that fewer than 20% of children with malaria in endemic areas are treated in formal health-care settings. Lastly, poor perceptions about the disease have hindered adequate care at home in most endemic areas. In Benin republic for example, over exposure to the sun and groundnut consumption are perceived to cause malaria [13] while in parts of South-West, Nigeria, overwork, sunlight, excessive sex, noise as well as witchcraft are thought to cause the disease. In rural parts of South Eastern Nigeria where these perceptions are also largely the same, the type of care given at home is usually informed by the perceived cause of the illness episode [14].

Therefore, to improve prompt and effective management of malaria, the World Health Organization (WHO) is promoting home-based management of malaria (HMM) as a major strategy for Africa. This strategy ensures correct and early recognition of the illness as well as prompt and proper administration of the recommended drugs. Community distributors are also involved in providing medications and educating primary caregivers about correct recognition of malaria, prompt treatment with recommended anti-malarial drugs, and recognition of severe illness. Emphasis on prompt treatment and distribution of pre-packaged anti-malarial drugs are strengths of the HMM strategy. However, there are potential downsides to presumptive treatment at home. Use of anti-malarial drugs to treat all febrile episodes, even if administered correctly, may delay treatment of other illnesses. In addition, unnecessary over-treatment with anti-malarial drugs could promote drug resistance and is likely to have substantial economic consequences [15].

The effectiveness of home treatment and management of malaria will therefore depend upon health education towards correct perceptions about malaria for early diagnosis by mothers and caregivers. Also it requires that mothers and caregivers obtain drugs promptly for early commencement of appropriate treatment which will ensure better outcome and prevent the progression to severe malaria. Furthermore, the need to recognize when there is no improvement in treatment and need to seek immediate help at the health facility is important. It therefore becomes necessary to determine the level of awareness and recommended ways of managing malaria at home among women especially those in the rural areas in Imo State. This will be an evidence based data that will help in better planning of education aimed at improving home management of malaria strategy. The researchers accessed the level of perceptions and pattern of home management of malaria in rural communities in Imo State, Nigeria.

## **2. METHODOLOGY**

A survey design was used and approval was given by research ethical committee of Federal University of Technology Owerri, Imo State, Nigeria. The traditional rulers of the study

communities and participants also gave their consent for the study. The study population involved adults resident in the rural communities of Imo State. A multistage sampling method was used. Imo state has three senatorial zones comprising of Orlu [twelve (12) local government areas (LGAs)], Owerri [Nine (9) local government areas], and Okigwe [six (6) local government areas]. These zones formed the clusters from which proportionate sample of LGAs were drawn by simple random sampling technique. Four LGAs (33.3%), three LGAs (33.3%) and two LGAs (33.3%) were randomly sampled from each zone respectively. Two communities were subsequently selected through simple random sampling method from each LGA giving a total of eighteen communities. Thereafter every household in the selected communities were included for the study. All the heads of households who were present on the day of investigation responded to the questionnaire in their preferred language. A total of two thousand six hundred and seventy four (2,674) adults responded to the questionnaire. The instruments used were the validated and reliable questionnaire as well as the focus group discussion. Each focus group was made up of six adults at a time and information extracted from them, both consensus and divergent views were used in discussion. Section A of the questionnaire sought information on socio-demographic characteristics of the respondents; Section B, sought information on respondents' perception and pattern of home management of malaria in the rural communities of Imo State, Nigeria.

There was a trial test of the instrument on 20 adults from one community which was not included in the main study. The split half reliability technique was adopted in establishing the reliability of the instrument. The Correlation Coefficient of  $r = 0.81$  was got indicating that the instrument was reliable. The administration of the instruments (questionnaire and focus group discussion) lasted for three months and data analysis done using percentages and charts.

For the focused group discussions, the issues canvassed focused on the rural communities' knowledge on cause, breeding site of mosquitoes and spread of malaria, signs and symptoms, health seeking behaviour, preventive measures and patterns of home management in the rural communities.

### **3. RESULTS**

A total of 2,674 complete records of respondents were available for analysis, 963 (36.0%) from Orlu, 881 (33.0%) from Owerri and 830 (31.0%) from Okigwe geopolitical zones of Imo State. The socio-demographic characteristics of the respondents are shown in Table 1. One thousand six hundred and fifty (61.7%) respondents were males while 1,024 (38.3%) were females. The mean age of the respondents was  $45.7 \pm 16.4$  years, with a majority of 639 (23.9%) in the age group of 31 – 40 years. A Majority of 2,043 (76.4%) were married at the time of this study while 286 (10.7%) were widowed. Also majority of 1,239 (46.3%) of the respondents attained secondary level of education, 304 (11.4%) had no formal education, while 422 (15.8%) were literate at tertiary level of education. Distribution of respondents by occupation revealed that trading ( $n=625$ , 23.4%) was the major occupation of rural dwellers in Imo State, followed by farming 497 (18.6%), while 342 (12.8%) were housewives. The result also indicated that majority of 1,356 (50.7%) lived on an average income of 18,000 Naira and below monthly while only 326 (12.2%) lived on an average income of 50,000 naira and above monthly. An average of 8 people made up a household in Imo rural communities with 1,100 (41.1%) respondents having 5-6 persons in a household.

**Table 1. Socio-demographic characteristics of the respondents**

<b>Socio-demographic characteristics</b>	<b>Frequency (N = 2674)</b>	<b>Percentage (%)</b>
<b>Gender</b>		
Male	1024	38.3
Female	1650	61.7
<b>Age group (years)</b>		
<21	66	2.5
21 - 30	504	18.8
31 - 40	639	23.9
41 - 50	526	19.7
51 - 60	399	14.9
61 - 70	317	11.9
71 +	223	8.3
<b>Marital status</b>		
Single	228	8.5
Married	2043	76.4
Divorced	117	4.4
Widowed	286	10.7
<b>Level of education</b>		
No Formal Education	304	11.4
Primary	709	26.5
Secondary	1239	46.3
Tertiary	422	15.8
<b>Occupation</b>		
Housewife	342	12.8
Student	219	8.2
Artisan	281	10.5
Farmer	497	18.6
Trader	625	23.4
Business tycoon	59	2.2
Civil servant	236	8.8
Professional (Lawyer, Engineer, Lecturer etc)	151	5.6
Others ( labourer, bricklayer, driver etc)	264	9.9
<b>Average monthly income</b>		
<18,000	1356	50.7
18,000 - 29,000	598	22.4
30,000 - 49,000	394	14.7
50,000 - 99,000	209	7.8
100,000 and above	117	4.4
<b>Number of persons in household</b>		
1 – 2	48	1.8
3 - 4	307	11.5
5 - 6	1100	41.1
7 - 8	570	21.3
9 - 10	321	12.0
>10	328	12.3

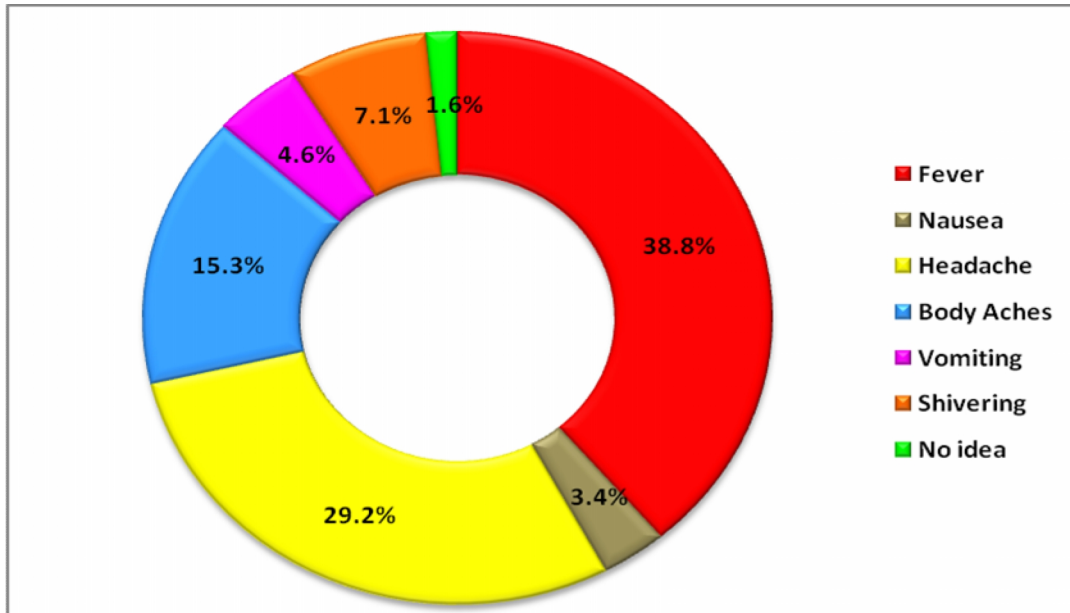
In terms of knowledge on breeding site, cause and spread of malaria, the results on Table 2 showed that a total of 2,542 (95.1%) of rural dwellers in Imo State have heard of malaria. Only about 976 (36.5%) of the respondents knew malaria is transmissible, however 2,262

(84.6%) reported that malaria is spread through mosquito bite. Furthermore; only 812 (30.4%) correctly indicated that female Anopheles mosquito transmits malaria. Majority of 1,501 (56.1%) respondents reported that stagnant dirty water is the most common breeding site of mosquito.

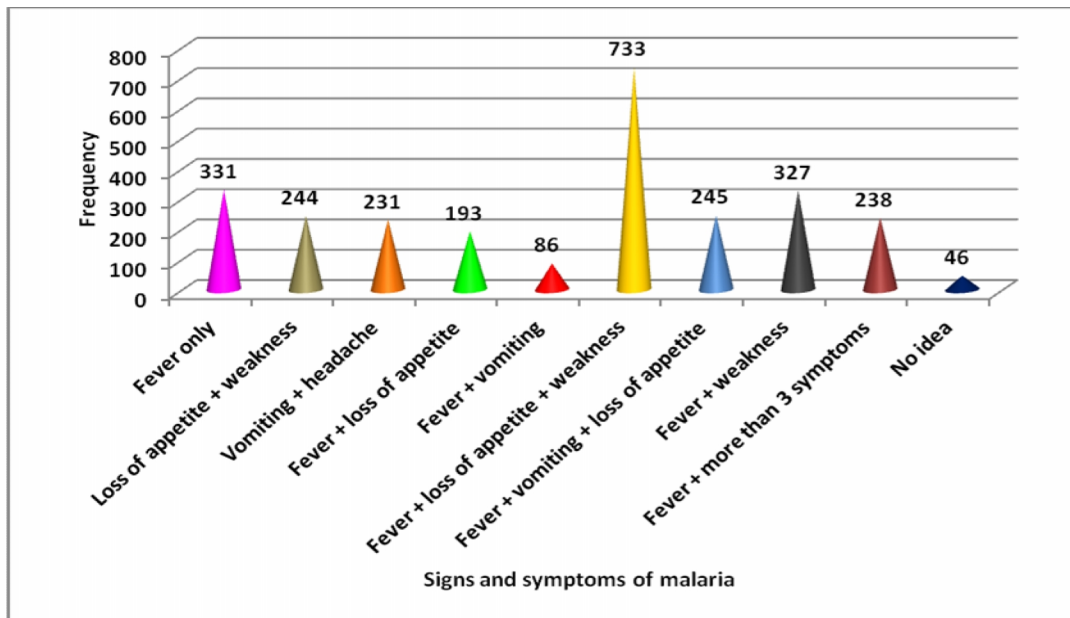
**Table 2. Respondents knowledge on cause, breeding site and spread of malaria**

<b>Variable</b>	<b>Frequency (N = 2674)</b>	<b>Percentage (%)</b>
<b>Have you heard of malaria</b>		
Yes	2542	95.1
No	132	4.9
<b>Is malaria transmissible</b>		
Yes	1683	62.9
No	976	36.5
No idea	15	0.6
<b>How do malaria spread</b>		
Mosquito bite	2262	84.6
Fly bite	110	4.1
Drinking dirty water	75	2.8
Eating unhygienic food	53	2.0
No idea	174	6.5
<b>Name the vector that transmits malaria parasite</b>		
Female Anopheles mosquito	812	30.4
Male Anopheles mosquito	105	3.9
Culex mosquito	52	1.9
Aedes mosquito	337	12.6
No idea	1368	51.2
<b>What is the common breeding site of mosquito</b>		
Running dirty water	289	10.8
Garbage/trash	179	6.7
Standing clean water	64	2.4
Stagnant dirty water	1501	56.1
Running clean water	73	2.7
Plants/flowers/bushes	421	15.7
No idea	147	5.5
<b>What is the frequent bite time of mosquito</b>		
Morning	289	10.8
Evening/Night	148	5.5
Noon	113	4.2
No idea	2124	79.5

The findings on knowledge of signs and symptoms of malaria indicated that fever (38.8%) was the most common symptom of malaria identified by the respondents, followed by headache (29.2%) and body aches (15.3%), the least reported symptom was nausea (3.4%); as shown in Fig. 1. Further investigation as shown in Fig. 2 on the symptoms utilized by respondents in making diagnosis of malaria at home revealed that a combination of fever + loss of appetite + weakness (n = 733, 27.4%) was the major signs & symptoms utilized by respondents to diagnose malaria, 12.4 percent utilized only having fever to diagnose malaria at home, fever + vomiting + loss of appetite was utilized by 9.2 percent of the respondents while 8.9 percent utilized fever + more than 3 symptoms.



**Fig. 1. knowledge of signs and symptoms of malaria as reported by respondents**



**Fig. 2. Signs and symptoms utilized by respondents in diagnosing malaria at home**

Health seeking behavior of respondents when they suspect malaria as documented in Fig. 3 below, revealed that majority, 41 percent patronize patent medicine stores/chemist, also 38.5 percent visits health centre/hospital. It is also indicated that 5.9 percent consult family member/friends/neighbor for help. The results on malaria preventive measures adopted by

respondents were shown in Fig. 4, it indicated that use of mosquito bed net (22.3%) and mosquito spray (21.8%) were the most practiced measures utilized in preventing malaria, this is followed by the use of mosquito mat, mosquito repellent/coils, liquid and vapourizer (14.8%). While 6.8 percent prefer covering their body with protective clothing to prevent malaria bite.

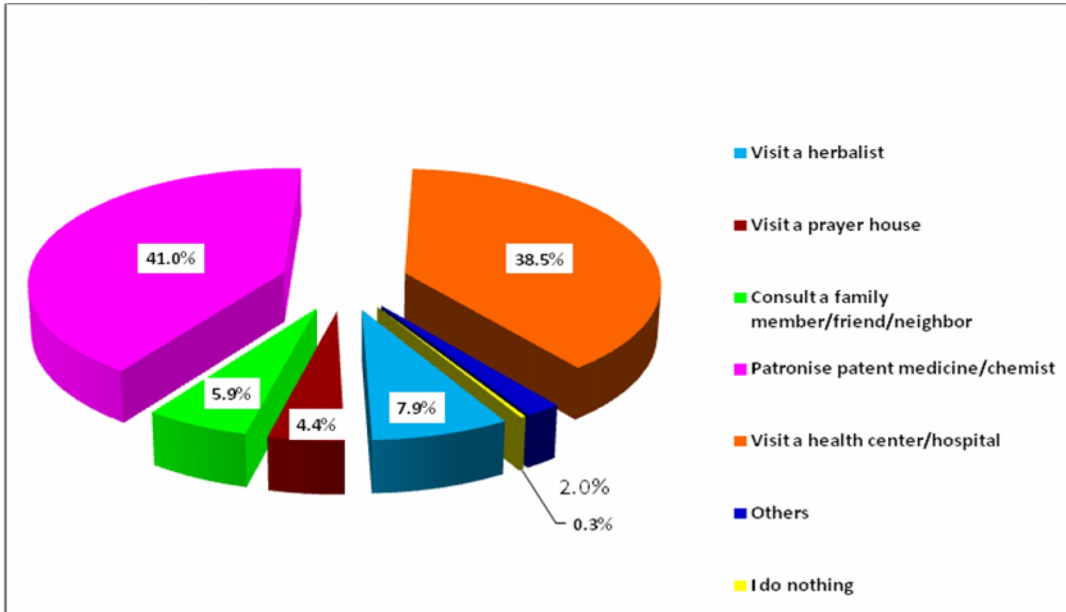


Fig. 3. Health seeking behavior of respondents when malaria is suspected

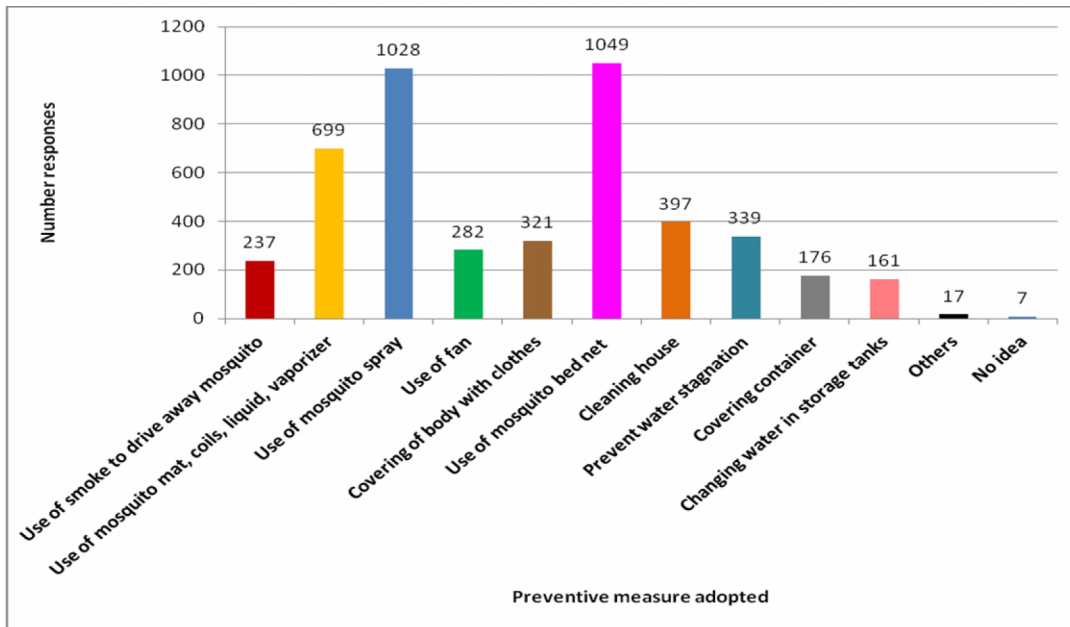


Fig. 4. Malaria preventive measures adopted by respondents



Malaria management methods practiced in rural communities of Imo state as shown in Fig. 5, revealed that majority of 62.3 percent adopted the use of anti-malaria drugs in the treatment of malaria at home, 10.5 percent utilized a locally found leaf (dogonyaro/Akum shut up) botanically known as *Azadirachta indica*. It is used in managing malaria at home because of its identified potency in curing malaria. Also 6.1 percent used a combination of seven different leaves (Pawpaw, mango, guava, Nchuanwu (*Occimum basilicum*) and awolowo leaf (*Chromolaena odorata*), orange and lemon grass) in managing malaria at home. Roots of herb were used by 6.1 percent of the respondents while 6.0 percent visited prayer houses for spiritual relief of the illness. Further investigation on the type of anti-malaria drug utilized in managing malaria at home indicated that 25.8 percent of the respondents used Chloroquine/Quinine, 30.2 percent used an Artemisinin-based Combination Therapy (ACT) and 6.3 percent used Sulphadoxine/Pyrimethamine.

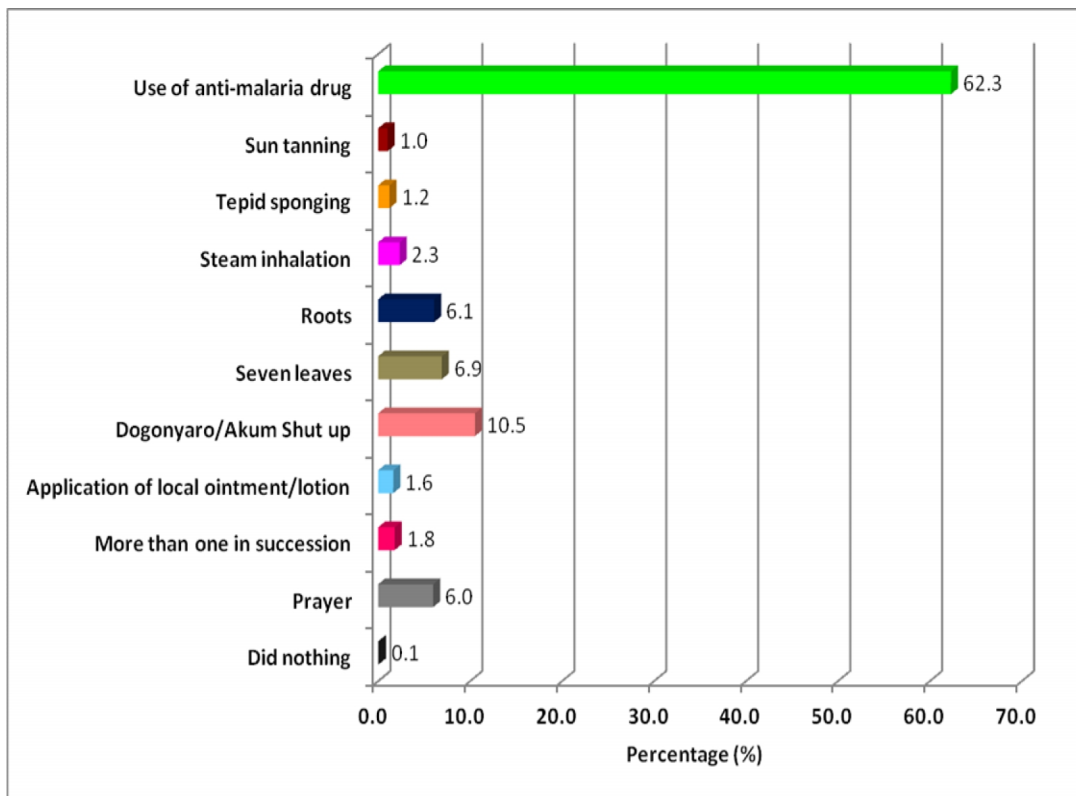


Fig. 5. Home management of malaria in rural communities in Imo State

#### 4. DISCUSSION

In this study, majority of the respondents 95.1% have heard of malaria but only 976 (36.5%) knew that it is transmissible and majority, 84.6% reported that malaria is spread through mosquito bite. About 30.4% indicated correctly that female anopheles mosquito transmits malaria while 56.1% reported that dirty stagnant water is the common breeding site for mosquitoes. The result showed that most people in the rural communities are still not clear about transmission of malaria and various breeding sites of mosquitoes which invariably

affect the preventive and treatment measures at home. This is in line with the study of [14,2, 13]. The most common symptom of malaria as indicated by respondents is fever and is used in diagnosis at home in combination with other symptoms like loss of appetite, headache, vomiting and weakness.

In terms of health seeking behaviour when malaria is suspected, majority patronize patent medicine stores/chemist, visit health centers/hospital, consult family members/friends/neighbour, visit herbalists and prayer house. Similar study was reported by [16,17]. The results on malaria preventive measures adopted by respondents revealed that the use of mosquito bed net and mosquito spray were the most practiced measures utilized in preventing malaria, this is followed by the use of mosquito mat, coils, liquid and vapourizer. While some prefer covering their body with protective clothing. Some preferred other measures to bed net because they do not have access to the net.

Malaria management methods practiced at home in rural communities of Imo state revealed that majority 62.3 percent adopted the use of anti-malaria drug in the treatment of malaria at home, 10.5 percent utilized a locally found leave Dogonyaro (Akum shut up) known as *Azadirachta indica*, for its locally identified potency in curing malaria. Furthermore, some used a combination of seven different leaves (Pawpaw, mango, guava, Nchuanwu (*Occimum basilicum*) and awolowo leaf (*Chromolaena odorata*), orange and lemon grass) in managing malaria at home. Roots of herb were used while some visited prayer houses for spiritual relief of the illness. Study by [18,19] confirmed the use of herbs in home management of Malaria. Further investigation on the type of anti-malaria drug utilized in managing malaria at home indicated that 25.8 percent of the respondents used Chloroquine/Quinine, 30.2 percent used an Artemisinin-based Combination Therapy (ACT), and 6.3 percent used Sulphadoxine/Pyrimethamine. A similar study by [20,14], used drug combinations in home management of malaria.

#### 4.1 Focus Group Discussion (FGD)

Eight qualitative FGDs were conducted, three in Orlu zone, three in Owerri zone and two in Okigwe zone. The areas explored were knowledge of causes, transmission, spread, preventive measures and home management of malaria. The participants were six adults in each focus group. Summary of the results from focus group discussion indicated that majority were aware that mosquito bites transmit and cause malaria while some said that oily, fatty food and excessive exposure to sun shine equally increase the occurrence of malaria. Various preventive measures were practiced but they acknowledged that the use of treated bed nets were more effective but not always available. Those who used smoke to drive away mosquito did so because they had no access to other preventive measures. They also reported that some had nets but did not use them due to hot weather as they had no cooling system. Participants reported that parts of the problems faced in the control of malaria at home are ignorance, belief, financial constraint and limited knowledge on how to manage malaria. Some noted that it was difficult to convince anyone who has been using herbs to change to the conventional home management pattern. Participants also noted that lack of money and distance from health center compel people to patronize non evidence based prescriptions which give rise to wrong diagnosis, fake drugs and complications of malaria.

## **5. CONCLUSION**

This study explored the perception and home management of malaria in rural communities in Imo State. Some had good knowledge of causes, transmission spread, breeding sites, signs and symptoms of malaria. Majority visited medicine stores first before going to hospital/health centers when they feel they were not having expected result while some visited the hospital first. Herbalists and prayer houses were equally visited. Various patterns were used in home management and mostly used were anti-malaria drugs including drug combination therapy and use of herbs. There is a new found surge in malaria drug discovery efforts [21-31]. There is also a world-wide interest in herbalism as new sources for new drugs [32], herbalism arises out of home management and our focus is on 'home management'. Therefore, there is need for health education on conventional pattern of home management of malaria in rural communities in Imo State, Nigeria.

## **CONSENT**

A survey design was used and approval was given by research ethical committee of Federal University of Technology Owerri, Imo State, Nigeria. The traditional rulers of the study communities and participants also gave their consent for the study.

## **ACKNOWLEDGEMENTS**

The authors would like to express their heart felt gratitude to Federal University of Technology Owerri for funding this research. We also appreciate the traditional rulers, Head of households and field assistants for their cooperation.

## **COMPETING INTERESTS**

Authors have declared that no competing interests exist.

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