

# Mothers' understanding of childhood malaria and practices in rural communities of Ise-Orun, Nigeria: implications for malaria control

Adebola Emmanuel Orimadegun<sup>1</sup>, Kemisola Stella Ilesanmi<sup>1</sup>

<sup>1</sup>Institute of Child Health, College of Medicine, University of Ibadan, Ibadan, Nigeria

## ABSTRACT

**Introduction:** Regular evaluations of communities' understanding of malaria-related practices are essential for control of the disease in endemic areas. This study was aimed at investigating the perceptions, prevention and treatments practices for childhood malaria by mothers in rural communities. **Materials and Methods:** We conducted a community-based cross-sectional study at rural communities of Ise-Orun local Government area, Nigeria. We randomly sampled 422 mothers of children less than 5 years and administered a validated questionnaire to assess their perceptions and practices relating to childhood malaria. We used a 10-point scale to assess perception and classified it as good ( $\geq 5$ ) or poor ( $< 5$ ). Predictive factors for poor perceptions were identified using logistic regression. **Results:** Approximately 51% of the mothers had poor perception and 14.2% ascribed malaria illness to mosquito bite only. Majority (85.8%) of the mothers practiced malaria preventive measures, including: Insecticide treated nets (70.0%), chemoprophylaxis (20.1%) and environmental sanitation (44.8%). Of the 200 mothers whose children had malaria fever within the 3 months prior to the study visits, home treatment was adopted by 87.5%. Local herbal remedies were combined with orthodox medicine in the treatments of malaria for 91.5% of the children. The main reasons for not seeking medical treatment at existing formal health facilities were "high cost", "challenges of access to facilities" and "mothers' preference for herbal remedies". Lack of formal education was the only independent predictor of poor malaria perceptions among mothers (OR = 1.91, 95% CI = 1.18, 3.12). **Conclusions:** Considerable misconceptions about malaria exist among mothers in the rural communities. The implications for malaria control in holoendemic areas are highlighted.

**Keywords:** Attitude and practice, childhood malaria, Ise-Orun, knowledge, malaria control, prevention strategies, rural communities, self-medication, under-5

## Introduction

Malaria remains a major public health problem in countries in sub-Saharan Africa despite efforts at controlling the disease.<sup>[1]</sup> According to World Health Organization (WHO) Children under five years of age are one of most vulnerable groups affected by malaria. There were an estimated 660,000 malaria deaths around the world in 2010, of which approximately 86% were in children under five years of age.<sup>[1]</sup> Though the latest estimates, showed that malaria mortality rates reduced globally by 49% in the WHO African regions between 2000 and 2012, the absolute number of malaria cases and deaths did not reducing as expected.<sup>[1]</sup> Malaria occurs in all parts of Nigeria with slight seasonal variations.<sup>[2]</sup> About one-third of the world's malaria deaths occur in Nigeria

and the disease still account for over 60% clinic visits. As much as 132 billion Naira (880,000 Million US Dollars) is lost to malaria as the cost of treatment and loss in man-hours every year.<sup>[2]</sup>

Improvements in access to prompt treatments as part of community-level interventions for strengthening home management of malaria are currently being promoted in the rural areas of Nigeria. To this end, mothers, being the primary caregivers at home, are key players in treatments of childhood malaria.<sup>[3]</sup> However, anecdotal observations revealed that malaria control programs that principally involve mother are not reaching many rural communities as expected. It is uncertain whether Nigeria will meet the malaria control target by 2015, having failed to optimize mothers' involvement in the rural communities.

Previous studies have shown that mothers' understanding of malaria and related issues is a key factor in achieving effective malaria control in endemic communities.<sup>[4-7]</sup> Given the prime roles

**Address for correspondence:** Dr. Adebola E. Orimadegun, Institute of Child Health, College of Medicine, University of Ibadan, Ibadan, Nigeria.  
E-mail: beorimadegun@yahoo.com

### Access this article online

#### Quick Response Code:



**Website:**  
www.jfmpc.com

**DOI:**  
10.4103/2249-4863.154655

play by mothers, there is the need to integrate them properly into malaria control and treatment activities.<sup>16,8)</sup> So far, studies conducted on mothers' involvements in malaria control programs within and outside Nigeria revealed conflicting views about mothers' perceptions of the disease, treatment seeking behaviors and prevention practices. The question of "what factors influence adoption and correct use of available malaria prevention practices by mothers in rural communities?" remains insufficiently addressed. Ise-Orun in Nigeria is predominantly rural communities and has high burden of malaria but little or no efforts have been made to reach the population with effective malaria control measures. Also, the understanding of mothers and treatment practices has not been researched. Therefore, this study was carried out to investigate the perceptions, practices of prevention and treatment for malaria in under-5 children among mothers in rural communities of Ise-Orun, an area holoendemic for malaria in Nigeria. The under-5 children are the focus of this study because of their high vulnerability.

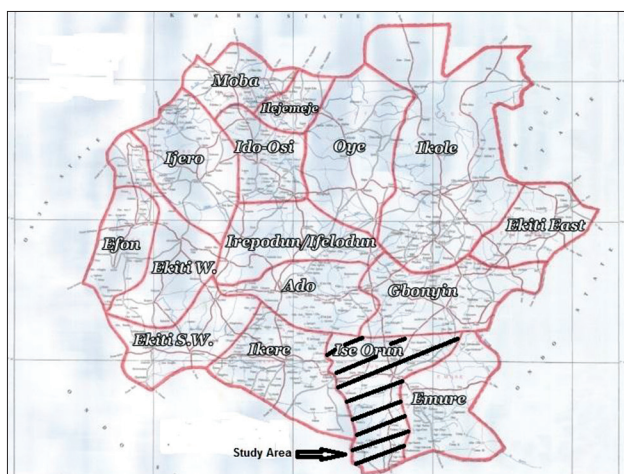
## Materials and Methods

### Study design and population

This study was a community-based cross-sectional survey conducted in villages of Ise-Orun Local Government Area (LGA) of Ekiti State, Nigeria between April and October, 2013. Mothers who had children less than five years old in the study area were interviewed.

### Description of the study area

The Ise-Orun LGA [Figure 1] is situated about 15 km away from Ado Ekiti, the state capital lies on the geographical coordinates of 7° 28'N, 5° 26'E. Malaria occurs throughout the year, the incidence peaks during the rainy season (April–October). Some of the villages are situated off the roads such that the people in these rural settings may have to travel 5–10 km to access healthcare. The Ise-Orun LGA was chosen for this study because of the anecdotal report of high malaria burden and lack of data for planning of malaria control strategies.<sup>9)</sup>



**Figure 1:** Administrative Map of Ekiti State showing the study area (Ise-Orun)

Source: [www.nigerianmuse.com](http://www.nigerianmuse.com)

### Sample size determination and participants recruitment

The investigators estimated that mothers of under-5s could be as many as 1000-2,000 based on 2006 census data. It was also assumed that 50% would have poor perception of malaria, thus the minimum sample size required to achieve the main objective of the study at 95% level confidence with an allowable error rate of 5% was 384. Adjusting for a non-response rate of 10%, this number was increased to 422. A multistage sampling technique was used to randomly select eight villages out of 29 officially delineated villages (called "Aba" in Yoruba language) of Ise-Orun Local Government Area (LGA). The villages selected were Aba Omuaran, Aba Ilogbo, Aba Osogbo (Ajebandele), Aba Odole, Osi Ilofa, Obada, Aba Oloketeta and Aba Ilogbo. Fifty-three households and a mother per household were randomly selected per village except in Aba Omuaran and Aba Ilogbo where a mother declined consents to participate respectively.

### Questionnaire and data collection

A semi-structured questionnaire with items adapted from four previous studies<sup>10-13)</sup> was used for data collection. The questionnaire items included: Socio-demographic characteristics, perceptions about malaria transmission, signs and symptoms, as well as prevention, treatments offered to children who had fever perceived to be malaria within 3-month period before the survey. The questionnaire was translated into the local language (Yoruba) and administered by trained research assistants. The contents of the questionnaire were discussed with malaria experts in the University of Ibadan and pre-tested the questionnaire among 60 mothers (Cronbach's alpha = 0.92).

### Data analysis

Data were entered and analyzed using SPSS 17.0 statistical software (SPSS Inc. USA). Main outcome variables were perceived causes of malaria, signs and symptoms, preventive measures used, and treatments sought for the last malaria episode. Independent variables included demographics variables. Perceptions were determined using a 10-point scale (items listed in Table 1). A score of <5 was regarded as poor perception. Chi-square test was used for test of associations and binary logistic regression was done to identify predictors of poor perception at  $P = 0.05$ .

### Ethical consideration

The study protocol was reviewed and approved by the University of Ibadan/University College Ethical Review Committee (Approval number: UI/EC/11/0295). Participation in the study was completely voluntary and written informed consent was obtained from each respondent.

## Results

### Characteristics of the mothers and children

Mothers' age ranged from 16.0 to 65.0 years (mean:  $31.2 \pm 8.8$  years). There were 119 (47.2%) male and 223 (52.8%) female children with mean age of  $35.3 \pm 17.1$  months.

Mothers aged 15–35 years constituted 75.4% ( $n = 318$ ). About 90% ( $n = 384$ ) of the mothers were married and living with husband. Majority ( $n = 329$ ; 78.0%) of the mothers were from the Yoruba ethnic group. Other ethnic groups included: Hausa/Fulani ( $n = 16$ ; 3.8%), Igbo ( $n = 32$ ; 7.6%), Igala ( $n = 3.6\%$ ), Idoma ( $n = 17$ ; 4.0%) and others ( $n = 13$ ; 3.1%). Figure 2 shows the distribution of mothers by educational status and living conditions were as shown in Table 2.

### Perceived causes of malaria in under-5 children stated by mothers

Of the 422 mothers, only 60 (14.2%) mentioned mosquito bite as the sole cause of malaria while 113 (26.8%) mothers attributed it to mosquito bite and other causes. Slightly more than 50% ( $n = 225$ ) of mothers mentioned “drinking dirty water” as a cause of malaria. Other perceived causes mentioned were: Dirty environment ( $n = 109$ , 25.8%), too much stress ( $n = 40$ , 9.5%), working/walking in the sun ( $n = 29$ , 6.9%), eating too much oil ( $n = 21$ , 5.0%), cold weather ( $n = 17$ , 4.0%), witchcraft ( $n = 8$ , 1.9%) and curse from elders ( $n = 5$ , 1.2%). Thirty mothers (7.1%) could not attribute a direct cause to malaria.

### Malaria-related perceptions and knowledge of symptoms

Table 2 shows the responses of mothers to questions or statements posed to assess malaria-related perceptions. Notably, 45% of mothers believed “malaria is a transmittable disease” while only 8.3% opined that mosquito bite is the only means of contracting malaria. Most (82.7%) of the mothers believed malaria has more adverse effect on children than adult. The median perceptions score was 4 (range, 0–9). Two hundred and sixty-nine (63.7%) mothers had poor malaria. Major signs and symptoms mentioned by mothers were as listed in Table 3.

### Malaria prevention practices

Most (85.8%) mothers practiced at least a method and 14.2% did not. The malaria prevention practices for under-5s reported by mothers were as shown in Table 4. The prevention practices adopted

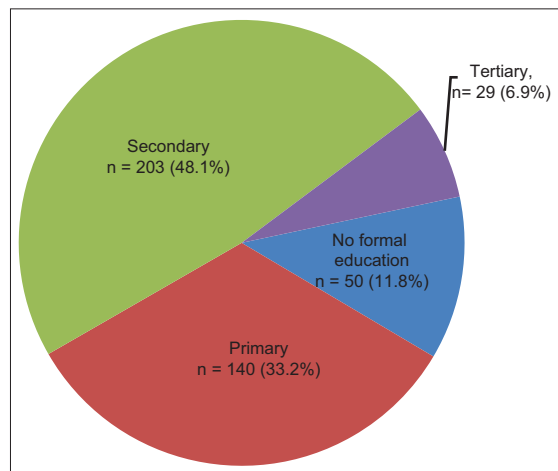


Figure 2: Distribution of mothers/caregivers by educational status

by mothers included: Insecticide treated net (70.0%), insecticide spray (13.8%), removal of stagnant water (29.9%), environmental sanitation (44.8%) and chemoprophylaxis (20.1%). Notably, 15 (3.6%) mothers reported difficulty with sleeping under bed-nets, skin rashes was associated with use of topical insect repellents (0.7%) and feeling of irritation when local herbs were used (1.7%).

### Mothers' experiences of children' recent perceived malaria illness

Of the 422 mothers, 200 (47.4%) reported that their children had perceived malaria illness in the 3-month period preceding the

Table 1: Housing and living conditions of index children

Characteristics	n	%
Types of housing		
Mud house with zinc/iron roofing sheets	186	44.1
Brick house with zinc/iron roofing sheets	123	29.1
Mud house with thatched roof	113	26.8
Number of people sleeping in same room with index child		
1-4	329	78.0
5-9	86	20.4
≥10	7	1.6
Toilet facilities		
Bush	355	84.1
Pit toilet	39	9.2
Modern toilet (water closet)	28	6.4
Sources of water		
Well water	376	89.1
Electricity, Fan, Radio, etc.	267	63.3
Surface water	29	6.9
Tap water	13	3.1
Tap and well water	4	0.9

Table 2: Malaria-related perception among 422 mothers/caregivers

	Yes/ True		No/ False		I don't know	
	n	%	n	%	n	%
Malaria has more adverse effects on children than older people	349*	82.7	73	17.3	0	0.0
Malaria illness occur more commonly during the raining season among children	295*	69.9	106	25.1	21	5.0
People who live in areas where there is stagnant water are at higher risk of malaria than those who are not	290*	68.7	103	24.4	29	6.9
Is malaria is a transmittable disease?	190*	45.0	225	53.3	7	1.7
Malaria occur more commonly among people with bushy environments	156*	37.0	237	56.2	29	6.9
Can someone get malaria by sleeping on the same bed with someone who has it?	96	22.7	94*	22.3	232	55.0
Those who have dirty bathroom and toilet are more likely to have malaria	89*	21.1	304	72.0	29	0.0
Mosquito bite is the only means of contract malaria	35*	8.3	387	91.7	0	0.0
Can a child get malaria from the mothers through breastfeeding?	30	7.1	160*	37.9	232	55.0
Malaria has more effect on children than adult because of their low immunity	6*	1.4	318	75.4	98	23.2

\*Responses correspond to good perception

**Table 3: Mothers' perceived signs and symptoms of malaria among under-5s**

	Mild cases		Severe cases	
	*n	%	*n	%
Fever	218	51.7	184	43.6
Headache	256	60.7	0	0.0
Cold and shivering	178	42.2	0	0.0
Vomiting	99	23.5	21	5.0
Body pain	69	16.4	0	0.0
Loss of appetite	32	7.6	42	10.0
Colored urine	27	6.4	0	0.0
Tiredness/fatigue	25	5.9	77	18.2
Convulsion	0	0.0	142	33.6
Red eyes	17	4.0	0	0.0
Excessive crying	10	2.4	0	0.0
Catarrh	8	1.9	0	0.0
Bitter mouth	7	1.7	2	0.5
Mouth blister/sore	0	0.0	2	0.5
Cough	6	1.4	0	0.0
Excessive sleeping	5	1.2	0	0.0
Diarrhea	4	0.9	0	0.0
Stomach pain	3	0.7	0	0.0
Bedwetting	2	0.5	0	0.0
Nausea	1	0.2	0	0.0
Inactive and dull	1	0.2	0	0.0
Pale/Anemia	0	0.0	109	25.8
Restless and incoherent	0	0.0	22	5.2
Difficult breathing	0	0.0	1	0.2
I don't know	1	0.2	34	8.1

**Table 4: Malaria prevention practices for under-5 as reported by mothers**

Prevention practices	*n	(%)
Insecticide treated bed nets (ITNs)	253	70.0
Wearing protective clothing	8	2.2
Insecticide spray	50	13.8
Environmental sanitation	189	44.8
Mosquito coil	45	12.4
Burning of herbs	15	3.6
Burning of dry orange peel	13	3.1
Cutting of bush around the house	10	2.8
Closing of windows	9	2.5
Net screened window and door	5	1.4
Burning of cow dung	4	1.1
Removal of stagnant water	2	0.6
Sprinkling of kerosene and water	1	0.3
Removal of stagnant water	126	29.9
Chemoprophylaxis	85	20.1
I don't use any method	60	14.2

study. Of the 200 mothers, 122 (61.0%) reported just one episode, 52 (26.0%) reported two episodes and 26 (13.0%) reported more than two episodes of febrile illness. Majority ( $n = 364$ ; 86.3%) of the mothers first manage the febrile illness at home. In cases of persistence of fever after home treatments, mothers stated that they visited the government health centers ( $n = 137$ ; 68.5%), local patent medicine stores ( $n = 23$ ; 11.5%), traditional medicine homes ( $n = 17$ ;

8.5%) and prayer houses ( $n = 7$ , 3.5%) and 16 (8.0%) mothers did not seek alternative care but change to other home remedies.

Regarding the preferred treatment, 222 (52.6%) mothers preferred orthodox medicine compare to herbal medicine ( $n = 200$ ; 47.4%). The preference for herbal over orthodox medicine was significantly associated with cheaper cost (33.0% versus 4.5%;  $P < 0.001$ ), and ready availability (40.0% versus 12.2%;  $P < 0.001$ ) and popular use among community members (2.5% versus 0.2%;  $P = 0.023$ ). Those mothers who preferred orthodox medicine (24.8%) than herbal medicine (10.0%) mainly gave "fewer adverse side effects" as the reason ( $P < 0.001$ ).

### Associations between mothers' characteristics and malaria perception

The associations between mothers' socio-demographic characteristics and malaria perceptions were examined and the odds-ratios were as stated in Table 5. The logistic regression model revealed that lack of education was the only predictor of poor perception (OR = 1.22, CI = 1.18, 3.12) among mothers of under-5s.

## Discussion

This study revealed that mothers in rural communities of Ise-Orun had poor perception and misconceptions about malaria in children and practiced self-medications. Only 14.2% mentioned mosquito bite as the sole source of malaria in children. However, most of the mothers were knowledgeable about signs and symptoms of mild cases of malaria and only a few mothers were familiar with signs and symptoms of severe cases. These findings are similar to the finding in some rural communities of Abeokuta<sup>[14]</sup> and Kuje area of Abuja, Nigeria.<sup>[15]</sup> Notably, some of the incorrect causes of malaria mentioned by mothers were "drinking dirty water", "stress", "working and walking in the sun", "eating too much oil", "cold weather", "witchcraft and curse from the community elders".

The good knowledge of diagnosis and recognition of malaria symptoms by mothers may not only be attributed to the level of education but to the fact that fever due to malaria is a common ailment affecting most children in Nigeria.<sup>[16,17]</sup> In addition, the mothers were also able to identify some features of severe malaria cases linking it with symptoms such as convulsions, fatigue, altered consciousness, loss of appetite and anemia. One main implication of the high level of knowledge of malaria symptoms and severity is that mothers' have ability to recognize some adverse effects of malaria may prompt early consultation for appropriated healthcare and correct treatment and these can lead to increase in malaria survival in children.

Perceptions about malaria were poor among the mothers, 63.7% expressed incorrect opinions. Remarkably, most mothers did not know that malaria is a communicable disease, and that it has more effect on under-five children than adult. Most of the mothers did not consider mosquito bite as a mean of contracting malaria. Malaria as an illness has been viewed differently both individually



**Table 5: Predictors of mothers' poor malaria perception among mothers of under-5s**

Predictors	Total	Poor perception		Good perception		Unadjusted		Adjusted	
		n	%	n	%	OR	95% CI	OR	95% CI
Mothers' age									
15-35	318	213	67.0	105	33.0	1.73	0.73, 2.61	1.74	0.89, 3.99
>35	104	56	53.8	48	46.2	1	-	1	-
Educational status									
None	50	35	70.0	15	30.0	1.38	1.11, 2.73	1.91	1.18, 3.12
At least primary	372	234	63.0	138	37.0	1	-	1	-
Marital status									
Unmarried	38	23	60.5	15	39.5	1	-	1	-
Married	384	246	64.1	138	35.9	1.16	0.59, 2.30	1.54	0.74, 3.19
Occupation									
Unemployed	26	20	77.0	6	23.0	1.96	0.77, 5.01	1.83	0.70, 4.80
Employed	396	249	62.9	147	37.1	1	-	1	-
Tribe									
Non-Yoruba	93	59	63.4	34	57.6	0.98	0.61, 1.59	0.85	0.52, 1.39
Yoruba	329	210	63.8	119	36.2	1	-	1	-
Position of index child									
First	112	77	68.8	35	31.2	1.35	0.85, 2.14	1.22	0.74, 2.02
Not first	310	192	61.9	118	38.1	1	-	1	-

OR: Odds Ratio CI: Confidence Interval. Note: Unadjusted OR were obtained from bivariate analyses (2x2 tables) while adjusted OR were derived from logistic regression model including all variables in the table

and communally in different settings. Mothers' correct perception of the disease has been discovered to have an important role to play in its prevention and treatment if not eradication.

Poor perceptions of malaria correlated with lack of education among mothers in the study area. This finding agrees with four earlier reports<sup>[4,18-20]</sup> all of which showed that being educated correlated with good perception about malaria. Mothers who have at least elementary education are more likely to make appropriate decision on health of children and seek care in formal health facilities. Interestingly, majority (85.8%) of the mothers in the study area used at least one form of malaria preventive measures for their under-5, including insecticide treated nets (70.0%). It appears that correct malaria prevention practices were generally acceptable among the study population. However, some mothers mentioned a number of unproven traditional or local prevention practices for malaria prevention such as "burning of dry orange peel", "burning of herbs", "burning of cow dung" and "sprinkling of kerosene and water". Similar to our finding, an earlier report found that a specific herb 'kanufu' was used as mosquito repellent in a rural Malawi village.<sup>[21]</sup> It is rather counterintuitive that despite the low level of knowledge about the cause of malaria, mothers could mention the use of different methods for malaria prevention in children. This observation contradicts two previous reports<sup>[22,23]</sup> which demonstrated a high correlation between knowledge of the cause of malaria and practices of malaria preventive strategies.

For effective treatment of malaria in children, mothers must have access to adequate and correct information about what control and treatment strategies work. However, the primary source of information about malaria in this study was the relative or friends suggesting that malaria information are mainly passed on to mothers by community members. Very often, this information

is of bias, evasive and loaded with misconceptions. With poor misconceptions, treatment seeking practices would inevitably get negatively influenced.

Another major finding is that self-medication was common among respondents. This involved taking antimalarials from "patent medicine stores", use of local herbs or related practices. Self-treatment using drugs sourced from sources other than recommended health facilities have been reported in some studies in malaria endemic countries.<sup>[10,14,24]</sup> It is evident therefore that self-medication contributes to delays in seeking appropriate health care which has the potential to exacerbate malaria illness. Self-medication can also explain the observed failure to comply with recommended malaria treatments which the potential to contribute to development of drug resistance. Also, the delay in seeking correct treatments could be due to high level of ignorance and misconceptions about malaria. Sometimes mothers based the decision to treat malaria with alternative medicine on the general beliefs of the community about the effectiveness of locally available treatment options and their experience of treatment given to similar illnesses. Mothers would consult traditional healers for malaria treatments mainly because of their services are not expensive, favorable previous personal experience and in some communities, the traditional healing centers are closer to people's residence than government-owned orthodox health facilities.

Though, this study has for the first time provided information on knowledge of malaria, perceptions about malaria, prevention practices and treatment seeking behaviors among mothers of under-fives in rural communities of Ise-Orun area of Nigeria, a few factors may limit the ability to generalize the findings. First, the extent to which mothers responded accurately to the questionnaire items based on their actual level of knowledge, perceptions and behaviors towards malaria in children could not be verified. It is

not unlikely that some information given by the mothers may not be the true representation of what actually happened. However, the findings are correct to the extent which the questionnaire was valid and reliably administered. It is important to note that the questionnaire was designed with items drawn from previous studies and pretested for validity in a relatively similar population of low-income families. The questionnaire was also translated into the local language (Yoruba) for easy understanding of the respondents; this should expectedly improve the quality of the data. Second, the similarity or otherwise of the mothers and children who did not participate in the study remains unknown. Our data are representative of the true situation in Ise-Orun communities to the extent to which the participants were randomly selected and their responses were accurately documented. Third, recall of experiences of mothers regarding malaria-related illnesses in the three months preceding the study may have been limited, thus creating potential for less precise data responses. This recall bias may have introduced some undeterminable level of errors if a large number of the mothers gave inaccurate information.

In all, findings in this study buttress the need for mothers in rural communities to be able to correctly recognize and link symptoms to malaria for effective home treatment and avoid misconceptions. Health education and improved health care services are recommended for rural women in order for them to be able to maximize use of available malaria-related services.

## Acknowledgements

We thank the Academic Staff or the Institute of Child Health, College of Medicine, University of Ibadan for their contributions to the proposal for this study and the review of the survey instrument.

## References

1. WHO. World Malaria Report 2013. WHO Global Malaria Programme. Geneva, Switzerland: World Health Organization; 2014.
2. FMOH. A Road Map for Malaria Control in Nigeria. Strategic Plan 2009-2013. Abuja, Nigeria: Federal Ministry of Health (FMOH), National Malaria Control Programme; 2008.
3. Sirima SB, Konate A, Tiono AB, Convelbo N, Cousens S, Pagnoni F. Early treatment of childhood fevers with prepackaged antimalarial drugs in the home reduces severe malaria morbidity in Burkina Faso. *Trop Med Int Health* 2003;8:133-9.
4. Agu AP, Nwojiji JO. Childhood malaria: Mothers' perception and treatment-seeking behaviour in a community in Ebonyi State, South East Nigeria. *J Comm Med Prim Health Care* 2005;17:45-50.
5. Ajayi IO, Falade CO, Olley BO, Yusuf B, Gbotosho S, Iyiola T, *et al.* A qualitative study of the feasibility and community perception on the effectiveness of artemether-lumefantrine use in the context of home management of malaria in south-west Nigeria. *BMC Health Serv Res* 2008;8:119.
6. Chirdan OO, Zoakah AI, Ejembi CL. Impact of health education on home treatment and prevention of malaria in Jengre, North Central Nigeria. *Ann Afr Med* 2008;7:112-9.
7. Ibidapo CA. Perception of causes of malaria and treatment-seeking behaviour of nursing mothers in a rural community. *Aust J Rural Health* 2005;13:214-8.
8. Kidane G, Morrow R. Teaching mothers to provide home treatment of malaria in Tigray, Ethiopia: A randomized trial. *Lancet* 2000;356:550-5.
9. Ministry of Health. Monthly malaria data from health centres in Ekiti State. Ado-Ekiti: Ekiti State Ministry of Health; 2013.
10. Chirdan OO, Zoakah AI, Ejembi CL. Impact of health education on home treatment and prevention of malaria in Jengre, North Central Nigeria. *Ann Afr Med* 2008;7:112-9.
11. Ibidapo CA. Perception of causes of malaria and treatment-seeking behaviour of nursing mothers in a rural community. *Aust J Rural Health* 2005;13:214-8.
12. Kengeya-Kayondo JF, Seeley JA, Kajura-Bajenja E, Kabunga E, Mubiru E, Sembajja F, *et al.* Recognition, treatment seeking behaviour and perception of cause of malaria among rural women in Uganda. *Acta Trop* 1994;58:267-73.
13. Owusu-Agyei S, Awini E, Anto F, Mensah-Afful T, Adjuk M, Hodgson A, *et al.* Assessing malaria control in the Kassena-Nankana district of northern Ghana through repeated surveys using the RBM tools. *Malar J* 2007;6:103.
14. Idowu OA, Mafiana CF, Luwoye JJ, Adehanloye O. Perceptions and home management practices of malaria in some rural communities in Abeokuta, Nigeria. *Travel Med Infect Dis* 2007;6:210-4.
15. Ashikeni MA, Envuladu EA, Zoakah AI. Perception and practice of malaria prevention and treatment among mothers in Kuje Area council of Federal Capital Territory, Abuja, Nigeria. *Inter J Med Biomed Res* 2013;2:213-22.
16. Akogun OB, John KK. Illness-related practices for the management of childhood malaria among the Bwatiye people of north-eastern Nigeria. *Malar J* 2005;4:13.
17. Ajayi IO, Falade CO. Pre-hospital treatment of febrile illness in children attending the general outpatients' clinic, University College Hospital, Ibadan Nigeria. *Afr J Med Med Sci* 2006;35:85-91.
18. Rodríguez AD, Penilla RP, Henry-Rodríguez M, Hemingway J, Betanzos AF, Hernández-Avila JE. Knowledge and beliefs about malaria transmission and practices for vector control in Southern Mexico. *Salud Publica Mex* 2003;45:110-6.
19. Ibeh CC, Ekejindu IM, Ibeh NC, Shu EN, Chukwuka JO. The pattern of home treatment of malaria in under-fives in south eastern Nigeria. *Afr J Med Med Sci* 2005;34:71-5.
20. Unnikrishnan AJ, Reshmi B. Awareness and treatment seeking behaviour of people affected with Malaria in Coastal South India. *Iranian J Publ Health* 2008;37:119-23.
21. Munthali AC. Managing Malaria in Under-Five children in a rural Malawian Village. *Nordic J Afr Studies* 2005;14:127-46.
22. Erhun WO, Agban EO, Adesanya SO. Malaria Prevention: Knowledge, Attitude and Practice in a Southwestern Community. *Afr J Biomed Res* 2005;8:25-9.
23. Seck I, Fall IS, Faye A, Ba O, Tal-Dia A. Malaria knowledge, attitudes and practices among women living in the rural area of Poponguine, Senegal. *Med Trop (Mars)* 2008;68:629-33.
24. Einterz EM. Perceptions of malaria transmission, presentation and management in northern Cameroon. *Trans R Soc Trop Med Hyg* 2003;97:51-2.

**How to cite this article:** Orimadegun AE, Ilesanmi KS. Mothers' understanding of childhood malaria and practices in rural communities of Ise-Orun, Nigeria: Implications for malaria control. *J Fam Med Primary Care* 2015;4:226-31.

**Source of Support:** Nil. **Conflict of Interest:** None declared.