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Assessment of Caregivers/Mothers Knowledge, Attitude and Practices in Prevention and Treatment of Childhood Malaria in Yewa South Local Government Area of Nigeria

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ABSTRACT

This study assessed mothers'/caregivers' knowledge, attitude and practices concerning home treatment and prevention of malaria in children with a view to ascertaining the determinants of adherence to the current treatment guidelines on drug therapy and Insecticide Treated Net (ITN) use. The study employed a cross-sectional design. Three hundred and thirty mother-child pairs were recruited for the study through multi-stage sampling method. The results showed that sizeable proportions of the respondents were able to identify the more common symptoms of uncomplicated malaria headache (67%), body weakness (50.9%), fever (44.2%) and 92.9% reported mosquito bite as the cause of malaria with 90.7% considered it as serious illness. One hundred and eighty-five (55%) respondents first treated malaria at home with orthodox medicines, herbs or provided other traditional forms of care. Artemisinin Combination Therapy (ACT) was mentioned by only 43.8% of the respondents but the proportion of mothers'/caregivers who administered it to children was 14%. Moreover, 96.3% of mothers/caregivers still gave Chloroquine, when they treated malaria at home. Respondents with higher educational attainments were more likely to use ITN compared with those of lower educational attainments ($\chi^2 = 15.6$, $p<0.05$). Furthermore, occupation was the only statistically significant predictors of ACT use (OR = 0.824, $p<0.05$). In conclusion, Knowledge about the change of recommended drug for the treatment of uncomplicated malaria at home and the use of ITN was still poor therefore effort must be intensified toward encouraging new recommended drug and ITN use.

Key words: Malaria, mothers/caregivers, childhood, ACT, ITN

INTRODUCTION

Malaria is a well-defined disease in which parasites of the genus *Plasmodium* are transmitted to human through the bite of female mosquito belonging to the genus *Anopheles*. The disease is known to be associated with fever, headache, chills, shivering, loss of appetite general body weakness and joint pains (Makundi *et al*., 2006). Prompt and effective treatment of malaria remains a challenge for malaria control programmes. Among the challenges to effective treatment include poor recognition of signs of severe malaria, delay in seeking appropriate treatment and non-adherence to treatment (Osero *et al*., 2006; Ajayi *et al*., 2008). In Africa, the majority of children with fever are treated at home, especially in rural areas.

This study therefore, examined factors influencing the use of effective prevention and adherence to current treatment recommendations for malaria in children by the mothers/caregivers in the study area.

MATERIAL AND METHOD

Selection of study participants was through multistage sampling procedure. Data was collected from selected mother-child pairs using a purpose designed, interviewer-administered, open and pre-coded questionnaires that was originally prepared in English and translated into local language and back translated into English to the check the consistency.

This questionnaire sought information on respondents' socio-demographic variables, knowledge of malaria prevention and treatment including home use of drugs and Insecticide Treated Nets (ITN). In addition, the mothers were asked on how the latest episode of fever was treated in the index child. The questions were pre-tested earlier in some selected EAs in the LGA. Verbal informed consent was obtained from the traditional rulers or ward heads and heads of households and respondents before the interview was conducted.

Knowledge assessment: Knowledge was assessed base on the respondent's answers to the knowledge questions in the questionnaires. The questions were related to knowledge of causes, symptoms and precautions to prevent malaria. Other questions enquired about the conditions that encourage the spread of malaria and knowledge about the categories of people that are more susceptible to malaria attack. The 60% or more was classified as having good knowledge while those who got less than were classified as having poor knowledge. The cut-off mark of 60% was set because the local government is a malaria endemic area therefore it was expected that a respondent should have an adequate knowledge of the disease.

Data analysis: Data generated from completed questionnaires were processed, edited and entered into computer using SPSS 15.0 version.

RESULTS

Table 1 shows the respondent's knowledge of the symptoms of malaria. Headache was most frequently mentioned symptoms by the respondent's (221, 67%) while diarrhea and vomiting were the least mentioned (36, 10.9%) symptoms. One hundred and forty six (146, 44.2%) felt fever is a symptoms of malaria.

Table 2 shows respondent's opinion about the seriousness of malaria as an infection. Almost all the respondent's (299, 90.6%) believe that malaria is a serious disease.

Table 1: Respondent's knowledge about symptoms of malaria

Responses	Frequency N = 330*	Percentage
Headache/dizziness	221	67.0
Cold	210	63.6
Body weakness	168	50.9
Fever	146	44.2
Loss of appetite	135	40.9
Diarrhea/vomiting	36	10.9

*Multiple responses allowed

Table 2: Respondent's opinion about seriousness of malaria

Knowledge of its seriousness	Frequency N = 330	Percentage
Serious	299	90.6
Not serious	3	0.9
No response	28	8.5
Total	330	100.0

Table 3: Action first taken to restore the child's health

Variables	Number n = 185	Percentage
Home treatment with orthodox medicine	80	43.2
Home treatment with herbs/native medicine	69	37.3
Traditional home care: balms, pepper soup	36	19.5

Table 4: Respondent's beliefs about the cause of malaria

Responses	Frequency N = 330*	Percentage
Mosquito bite	308	92.9
Changing weather	81	26.2
Ingestion contaminated food/water	77	24.9
Drenched by rain	42	13.6
Witchcraft	11	3.6
Others		38 12.3

*Multiple responses allowed

Table 5: Sources of the drugs for home treatment of childhood malaria

Variables	Numbers	Percentage
Govt. hospital	24	13.0
Govt. health center	25	13.5
Govt. health post	3	1.6
Mobile clinic	1	0.5
Pharmacy	9	4.9
Private doctor	28	15.1
Drug hawker	1	0.5
Traditional practitioner	1	0.5
No response	58	31.4

*Multiple responses allowed

Table 3 shows the mother's response to the illness. Eighty (43.2%) of the mothers treated their children at home with orthodox drugs while 69 (37.3%) used native medicine or herbs. The remaining 36 (19.55) gave traditional home care comprising application of balms, pepper soup and others.

Table 4 describes respondent's beliefs about the cause of malaria. Mosquito bite was the most frequently mentioned cause of malaria (92.9%) and this is followed by changing weather (26.2%), contaminated food (24.9%), drenched by rain (13.6%) and witchcraft (12.3%). Others causes that were mentioned by the respondents were eating excess palm oil, stress having many wives or sex partners.

Table 5 shows various sources of drug administered to the index children by the respondents. Private hospitals were mostly patronized by the respondents (34, 18.4%) this is closely followed by private doctors, Govt. health center (25, 13.5%) and Govt. Hospitals (24, 13%). Traditional health practitioner and drugs hawkers are the least patronized.

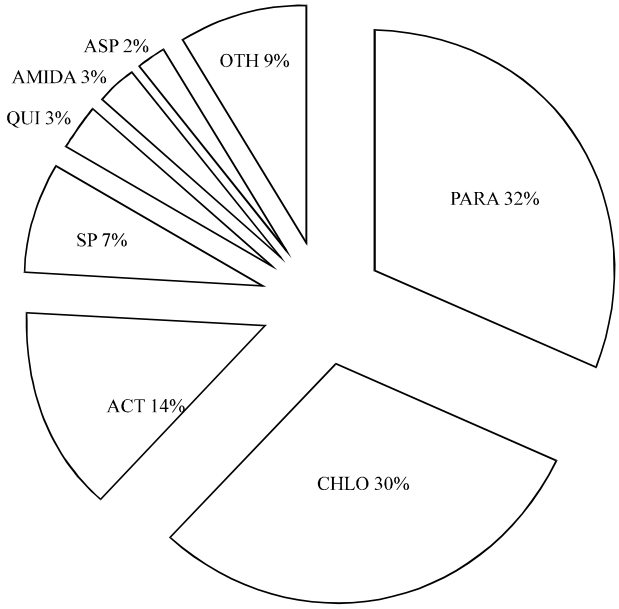

Fig. 1: Proportion that used ACT

Table 6: Respondent's constraints to the use of ITN

Reasons	Number	Percentage
Not convenient	36	10.9
Irritating odour	27	8.2
Causes vomit	13	3.9
Nowhere to hang the net	25	8.5
No definite response	226	68.5
	330	100.0

Figure 1 shows the proportion of children that were given ACT among the index children. Out of total number of one hundred and eighty five children that were reported to have had malaria 2 weeks precede the day of survey, only 14% claimed to have administered ACT to their children. Other drugs like chloroquine, sulphadoxine-pyrimethamine and various form of analgesic account for 86%.

Figure 2 shows the availability and use of ITN by the mothers'/caregivers'-child pair. Forty nine percent claimed to possess ITN. Twenty nine percent of the mothers'/caregivers'-child pair claimed to have used it a previous night to the day of data collection. In 20% of respondents, ITN was hung during data collection.

Table 6 describes respondent's constraints to the use of ITN. Thirty six of the respondents (10.9%) said it was not convenient to sleep-in. Twenty seven (8.2%) said it has irritating odour therefore making it not convenient to sleep-in. Others reasons mentioned are causes vomit (13, 3.9%), nowhere to hang the net (25, 8.5%).

Table 7 shows association between mothers'/caregiver's socio-demographic characteristics and their knowledge about malaria. The tests of knowledge against various variables mentioned are all statistically not significant ($p>0.05$).

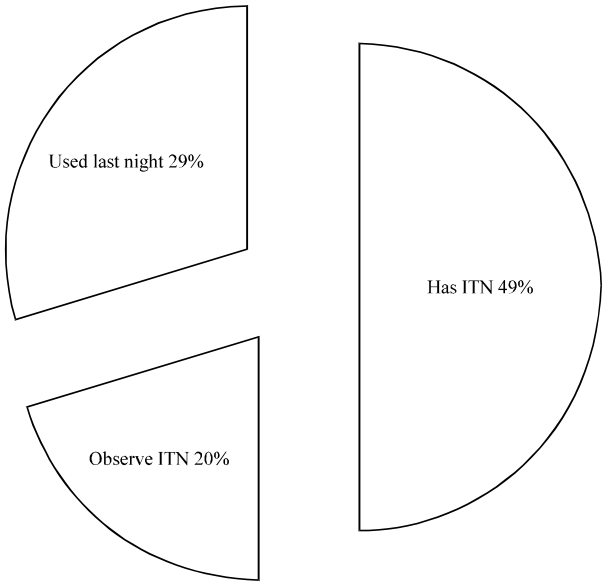

Fig. 2: Availability and use of ITN

Table 7: Knowledge about malaria by some socio-demographic characteristics of the respondents

	Knowledge of malaria (N = 330)					
	Good		Poor			
Socio-demographic character	No.	%	No.	%	Total	Statistical indices
Age (years)						
10-19	3	37.5	5	62.5	8	
20-29	41	39.8	62	60.2	103	$\chi^2 = 3.844$
30-39	60	48.8	63	51.2	123	df = 4
40-49	30	42.3	41	57.7	71	p = 0.572
>50	13	54.2	12	45.8	25	
Education						
None	10	43.5	13	56.5	23	
Primary	41	46.1	48	53.9	89	$\chi^2 = 5.860$
Secondary	44	39.5	67	60.5	111	df = 4
Tertiary	52	50.57	51	49.5	102	p = 0.320
No response	0	0.0	4	100.0	4	
Marital status						
Single	6	37.5	10	62.5	16	
Married	122	43.9	156	56.1	278	$\chi^2 = 1.471$
Divorced	9	50.0	9	50.0	18	df = 3
Widow	10	55.6	8	44.4	18	p = 0.689
Occupation						
Trading	74	44.3	93	55.7	167	
Artisan	26	40.6	38	59.4	64	
Farming	11	55.0	9	45.0	20	
Teaching	9	50.0	9	50.0	18	$\chi^2 = 2.635$
Civil servant	14	51.9	13	48.1	27	df = 5
Not employed	13	38.2	21	61.8	34	p = 0.756

Table 8: Use of ITN and socio-demographic characteristics of mothers/caregivers of children

	Use of ITN					
	Yes		No			
Socio-demographic characteristics	No.	%	No.	%	Total	Statistical indices
Age (years)						
19-29	3	12.5	5	62.1	8	$\chi^2 = 6.507$
30-39	39	37.9	64	62.1	103	df = 5
40-49	51	41.5	72	58.5	123	P = 0.260
50-59	34	47.9	37	52.1	71	
60-69	7	29.2	17	70.8	24	
>60	0	0.0	1	100.0	1	
Education						
None	2	8.7	21	91.3	23	$\chi^2 = 15.654$
Primary	34	38.2	55	61.8	89	df = 4
Secondary	42	37.8	69	62.2	111	p = 0.04
Tertiary	51	49.5	52	50.5	103	
No response	3	75.0	1	25.0	4	
Marital status						
Single	5	31.2	11	68.8	16	$\chi^2 = 2.546$
Married	109	39.2	169	60.8	278	df = 3
Divorced	10	55.6	8	44.4	18	P = .467
Widow	8	44.4	10	55.6	18	
Occupation						
Trading	50	29.9	117	70.1	167	$\chi^2 = 42.001$
Artisan	30	46.9	34	53.1	64	df = 5
Farming	4	20.0	16	80.0	20	P = 0.000
Teaching	14	77.8	4	22.2	18	
Civil servant	22	81.5	5	18.5	27	
Not employed	12	35.3	22	64.7	34	

Table 8 shows the association of respondent's demographic characteristics with the willingness to use ITN as a form of protection against mosquito bite. Level of Education and type of occupation is statistically significant with the usage of ITN ($p<0.05$) while others (Age and Marital status are not statistically significant with ITN use ($p>0.05$).

Table 9 shows determinants of use of currently recommended anti-malarial, ACT and Insecticide treated net by the respondents. All factors included as determinant of adherence to current treatment therapy are statistically not significant ($p>0.05$) except age versus the use of ITN.

DISCUSSION

In this study, almost all the mothers interviewed (92.9%) identified mosquito bite as the cause of malaria though a few of the respondents had wrong perception of the cause of malaria where malaria was associated with dirty compounds, dirty food/utensils, un-boiled water and uncooked food this is in agreement with similar study conducted by Osero *et al.* (2006). They opined that being drenched by rain and cold weather could cause malaria. These wrong beliefs perhaps reflect the association of malaria with appearance of stagnant pools of water (potential breeding sites for mosquitoes) as likely to occur during the raining season.

Table 9: Determinants of use of currently recommended antimalarial (ACT and ITN) in children by the respondents

Factors	B	SE	Wald	Df	p	Odd R
ACT						
*Occupation	-0.193	0.069	0.7.876	1	0.005	0.824
Marital status	-0.312	0.225	0.1.922	1	0.166	0.732
Age of the mothers	-0.049	0.122	0.162	1	0.687	0.952
Model summary						
Cox and snell R square	0.061					
Nagelkerke R square	0.083					
ITN						
Education	0.001	0.139	0.000	1	0.996	1.001
Income	0.177	0.097	3.310	1	0.69	1.193
Marital status	0.333	0.373	0.797	1	0.372	1.396
*Age of the mothers	-0.494	0.221	4.986	1	0.026	0.610
Model summary						
Cox and snell R square	0.032					
Nagelkerke R square	0.064					

*Statistically significant

In opposition to this, another study conducted in Jos, middle belt region of Nigeria, among mothers and caregivers of under-fives revealed a low level of knowledge of malaria with 49.6% of the respondents being knowledgeable about the signs of the disease and 24.9% attributing it to the mosquito bite (Daboer *et al*., 2010). Similarly, in another study conducted by Mwenesi *et al*. (1995) in rural Kenya respondents did not know the link between mosquito and malaria. While the reason for this difference is not very clear, perhaps it reflects differences in levels of malaria endemicity in the three study areas-Jos, Ilaro and Kenya. Furthermore, Oladepo *et al*. (2010) in a study conducted in two rural communities of Oyo State, Nigeria, where malaria is endemic reported that only 24.9% of the respondents were able to attribute malaria infection to mosquito bite. Concerning this incorrect knowledge of malaria aetiology, Salako *et al*. (2001) opined that this perhaps reflects superstitious beliefs among Yoruba tribe of western Nigeria which fails to recognize the link between malaria infection and mosquito bite. In this respect, overwork, eating too much palm oil and working under the sun are factors that are believed to cause malaria infection. Some respondents in this study shared similar beliefs since they reported stress, being drenched by rain, working in the sun as causes of malaria. It is therefore evident that the development of health education messages must take into cognizance cultural-based ideas about malaria aetiology in effort to combat its scourge (De La Cruz *et al*., 2006).

The ability of mothers to recognize symptoms of malaria early is important if treatment has to be instituted promptly and severe morbidity averted. In this study the respondents demonstrated adequate knowledge of the symptoms of malaria. The respondent's identified fever, headache, vomiting, shivering, body weakness were correctly identified as some of the clinical manifestations of uncomplicated malaria by the respondents. This is in agreement with studies conducted by Budhathoki and Bc (2008) and Osero *et al*. (2006) where respondents were able to correctly identify the correct symptoms of malaria although the literate respondents performed better than the illiterate ones. This might be as a result of a larger percentage of the mothers (60.6%) being educated up to secondary level and beyond. Although in the knowledge score, no socio-demographic variables of the respondents was statistically significant with the malaria knowledge ($p>0.05$). This might be due to high cut-off point of 60% assigned to adequate knowledge of the disease in this study.

In a study by Adah *et al.* (2009), it was reported that only one of five children with presumptive malaria received a correct dose of anti-malaria. Some other more recent studies have also shown that mothers persist to use chloroquine (a failing anti-malaria) instead of Artemisinin-combined Therapy (ACT) the currently recommended anti-malaria drug for the treatment of uncomplicated malaria at home and in health facilities. Orimadegun *et al.* (2008) opined that there was no clinical improvement perhaps because the mothers used chloroquine which has been found to have unacceptable level of therapeutic failure in Nigeria. They therefore highlighted the need for wide-scale monitoring of the withdrawal of chloroquine from the national drug distribution network. Other reasons for poor outcome of treatment of malaria at home in malaria endemic areas by mothers and caregivers have been ascribed to poor diagnosis and prescription, non-compliance with treatment recommendations at home and the use of ineffective drugs (Tarimo *et al.*, 2006). Several of these issues were also observed in the present study as most of the respondents treated their children with chloroquine and analgesics (paracetamol). The persistent use of chloroquine as a drug of choice for home treatment of malaria may be related to the high price of ACT but it nevertheless has grave implications for child health as malaria is reported to account for about 30% of child deaths in Nigeria.

The regression analysis further showed that age (OR = 0.610, $p<0.05$) and occupation (OR = 0.824, $p<0.05$) are significant as determinants for the adoption of current drug therapy (ACT) and ITN in this study. Occupation may determine the level of income, which might affect the choice of treatments by the mothers or caregivers. The association of level of respondents income with the choice of drugs as earlier been reported by Mutabingwa (2005) and Whitty *et al.* (2008).

In this study, although 66.7% of respondents were of opinion that insecticide treated net was a major tool in mosquito prevention, only 49% reported owning ITN and 29% reported they slept under ITN the night before data collection. This finding is similar to the observation by De La Cruz *et al.* (2006) but quite different from the experience of Simsek and Kurcer (2005). Incidentally, even in countries providing ITN access such as Zambia. Macintyre *et al.* (2012) and Adewole *et al.* (2011) reported gaps between ITN ownership, deployment and use. In addition, they observed that barriers outside cost that affected ITN deployment include perception of malaria risk and proximity to a clinic.

In another study, Chase *et al.* (2009) examined the drivers of ITN purchase and use in a rural area of southern Mozambique. They also specifically compared how demand for other mosquito prevention methods affected ITN use within the households. They noted that overall household ownership of ITN was not related to poverty but that formal schooling and market knowledge determined higher average willingness to pay for ITN while use of other methods for malaria prevention including indoor residual spraying decreased demand for ITN. This view is similar to the one observed in this study where majority of the respondents preferred the use of insecticidal spray to the use of ITN. This might be as result of the price or it's readily availability in the markets. Therefore, increasing household ownership of ITN might result in impressive gains in awareness, ownership and use of ITN (Baume and Marin, 2008).

In this study, it was observed that ITN use was associated with respondent's level of education and occupation ($p>0.05$). This finding corroborates earlier reports of association linking education and income level with improved ITN use. Therefore, making the ITN available at a very low price can increase the coverage. Other reasons given by the respondents of this study for not using ITN included net odour and inability to hang the net. Similar reasons were adduced by respondents of a study conducted by Iwashita *et al.* (2010) and Renne *et al.* (2007) where it was reported that

sleeping arrangement and availability of suitable location to hang the net was a hindrance to possession of ITN in their study areas. These reasons also highlight a need for technological improvement in making ITN attractive to the end users.

CONCLUSION

In conclusion, adequate knowledge of the symptoms of malaria has implication for prompt care seeking and prevention of progression of uncomplicated malaria to severe morbidity and even mortality. While knowledge of malaria symptoms such as fever and other signs by mothers and caregivers is desirable, it is also important for mothers to be aware that other childhood conditions including potentially serious ones may also present with fever and the others clinical manifestations of malaria. Therefore, mothers need to be adequately educated so that they may seek care from appropriate providers when a child with fever is not responding to treatment with the recommended anti-malaria drugs.

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