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Full Length Research Paper

Home Management and Prevention of Malaria among Under-Five Children: Experiences of Mothers in a Nigerian Local Government Area

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ABSTRACT

The ravaging effect of malaria on children is of concern due to its high mortality and morbidity rates. This study assessed the practices of mothers of under-five children in home management and prevention of malaria. Multistage random sampling technique was used for selection of 837mothers of under-five. The instruments used were focus group discussion and structured questionnaire. Statistical Package for Social Sciences (SPSS) was used for data entry and analysis. Each correct answer on knowledge was assigned a score of one (1), while wrong answer got zero (0). The scores were graded as high (60% to 100%), average (40% to 59%) or low (<40%). The items on practices were ranked as always (2), occasional (1) and never (0), they were graded as good- 60% to 100%, fair- 40% to 59% and poor- <40%. **T**he level of knowledge of the respondents on causes, transmission and symptoms of malaria was low, as 75% of them scored less than 40%, 45.2% scored less than 40% in knowledge of prevention, 97.7% scored less than 40% in practices of home management and 63.3% scored <40% in preventive practices. The findings of this study justify and support the need for interventional study to improve the mothers' experiences in practices of home management and prevention of malaria.

Key-words: Home management; Malaria; Mothers; Prevention; Under-five children

INTRODUCTION

Malaria is a major cause of morbidity and mortality in sub- Saharan Africa. It is highly endemic and remains a significant public health disease in this area (WHO 2006). About 74% of the population of the continent is estimated to be residing in highly endemic areas, and 19% are in epidemic prone area while just 7% live in low risk or malaria-free areas (WHO 2006).

Malaria poses a great challenge to the African region as it hinders human development through loss of

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substantive work time and huge treatment cost. It is estimated that 50% of the adult population experience at least one episode yearly while the under – five children may have up to two to four attacks of malaria annually (Federal Ministry of Health (FMOH) 2005). It is the commonest reason for all hospital outpatient attendance in all age groups in Nigeria (National population commission (NPC) 2008). Incidence of malaria is very high and characterized by different forms of challenges. However, it is observed to be responsible for over 60% of outpatient cases and 20% of admissions in health facilities. (NPC2008). It is estimated that malaria could be responsible for an average annual reduction of 1.3% in economic growth in Africa with many families spending a significant portion of their income on treating it (WHO 2006).

Children are more susceptible to malaria attacks during the first five years of life due to inadequate immunity (Frey *et al* 2006, WHO 2006).Ajayi 2005, Falade *et al* 2005 and Ebuehi *et al* 2010) opined that most fever occurring in children is first treated at home by mothers and care givers and early recognition and correct management by mothers at home have been shown to impact outcome of the disease positively. However, there is usually inappropriate treatment of malaria at home due to poor knowledge of causation and transmission of malaria as well as types and dosage of drugs used (Ajayi 2005, Falade *et al* 2005). Hence, deterioration of initial uncomplicated malaria to complicated one leading to death of a very large number of the under-five children (Falade *et al* 2006, Orimadegun 2010).

Prevention of malaria has been globally accepted as a significant aspect of malaria control but majority of mothers of under-five often do not learn the tenets of prevention (Falade *et al* 2006, Obrist *et al* 2010).Falade *et al* 2006found out in their study that many of the mothers do not even believe malaria can be prevented because of series of myths and misconceptions they associate with fever in children. Obrist *et al* 2010 observed that information on utilization of preventive measures like screening of windows and doors with nets, spraying the house with insecticides aerosol, application of insecticide repellant cream, wearing of long sleeved clothes and destruction of mosquito breeding sites are not common. Also in spite of publicity of insecticide treated net (ITN) which is the most prominent malaria preventive measure for large-scale distribution in highly endemic areas is not yet available in large quantity in Osun state of Nigeria. As at December 2011, Osun state received and distributed 129,282 pieces of insecticide treated nets (Osun state Ministry of health. This figure is rather too low when compared with the population of the state which is over three million.

This study assessed knowledge of causes, transmission, symptoms, home management of and prevention of malaria as well as practices of home management and prevention of malaria among mothers of under-five children thus determining the poor experiences the mothers were going through. Most previous studies on prevention and control of malaria in the country focused on the use of ITNs but this study examined mothers' knowledge and practices of all forms of preventive measures.

The findings of this study are expected to provide information that will help the community health practitioners to adequately plan, implement and evaluate programme that will support management and control of malaria particularly among the under-five children.

MATERIALS AND METHODS

The study, a cross sectional adopting explorative survey approach, was carried out in Egbedore local government area (LGA) in Osun state, South Western Nigeria. The local government area is located at the North West of the state and covers approximately 102 square kilometres of land (Egbedore LGA 2008). The tropical rain coupled with fertile land support farming as the predominant occupation. The local government area is made up of 10 political wards and most of the communities are rural. The population of the LGA according to year 2006 population census is 73,969, consisting of 37,302 males and 36,667 females (Federal Republic of Nigeria 2006).The inhabitants of Egbedore LGA are predominantly Yorubas of the Oyo extraction and are mainly adherents of Islamic, Christianity and traditional faiths. There are 22 primary health care facilities owned by the LGA and one National Primary Health Care Centre (Egbedore LGA 2008).

Target population: The populations for this study were mothers of under-five children residing in Egbedore LGA in Osun State South West of Nigeria.

Sampling procedure and sample size: The research adopted a survey method to select the respondents for the study. Hence, a total of 837 mothers who fulfilled the inclusion criterion (i.e. residency in the selected communities for the study for a minimum of one year) were selected. Multistage random sampling procedure was used for selection of the mothers in seven wards of the LGA. At the first stage, Egbedore local government area (LGA) was purposively selected for the study based

on the fact that it is one of the rural local government areas in the state with highest numbers of malaria cases in years 2008 to 2010 (OSMOH 2011). At the second stage, seven wards (wards 2, 3, 4, 5, 6, 8 and 9) were randomly selected being 60% of the wards in the local government area. The third stage of the sampling procedure entailed selection of women in the communities using the ratio of sample population to the projected population.Balloting was used to pick a mother of under-five children in a household where they were more than one.

Ethical Consideration: Ethical approval was obtained from Ladoke Akintola University of Technology (LAUTECH) Teaching Hospital Osogbo, Osun state ethical committee. Official permission was also obtained from the chairman of Egbedore local government area. Permission to collect information was taken from the head of the household and the mother. The selected mothers were adequately informed of the purpose and process of the study and their voluntary consents were obtained through the consent forms signed.

Data collection procedure: Two instruments were used for data collection; structured questionnaire and focus group discussion (FGD).The FGD guide consisted of 10 open ended questions which were to elicit information on causes and transmission of malaria and mothers' practices of home treatment and prevention of malaria. The information obtained from the FGD was used to formulate content areas and get right language to be used in questionnaire; its findings were not analyzed.

The structured questionnaire comprised of open and close ended questions which were used to elicit information on menace of malaria disease, its treatment at home and prevention practices. It was developed in English language from literature review and adapted questions from related past studies in Nigeria. The Yoruba version of the questionnaire was produced after necessary modification to the English version had been done. It consisted of 46 questions divided into nine sections. The questionnaire was validated by the researchers working on malaria control in university of Ibadan. It was pretested in Ekuro, a similar rural community in Southern part of the LGA. Unclear and ambiguous questions were modified thereafter.

The questionnaire was also subjected to congruence and test retest reliability tests, the coefficient of stability (r) was 0.937 and p-value was 0.000 and the comparison of the Yoruba and English tests measured the coefficient of equivalence (r) as 0.914 with its p-value as 0.000.The reliability test in comparison of the two Yoruba versions gave (r) as 0.971 and p-value was 0.000.

RESULTS

Socio-demographic characteristics: Table 1 reveals that most of the respondents (92.6%) were married, 4.4% were widow, 1.8%was single parents and 1.1% was divorced. Majority of the respondents (89.5%) indicated that their husbands were the heads of their families and 10.5% claimed to be the heads of their families. About 50% of the respondents were between 25 and 34 years old, 27.0% of them possessed primary six leaving certificates, 31.9% had either junior or senior secondary school certificates while just 2.3% obtained first degree certificate or its equivalents. Most of the respondents (63.8%) had one under-five child, 31.1% had two, 4.9% had three while 0.2% had four.

Knowledge and practice scores: Each correct item on knowledge of causes, transmission and symptoms of malaria as well as home management and prevention of malaria was allocated one (1). The total obtainable mark for the three levels of knowledge was 84, the mean was 38.77, median was 39 and the standard deviation was 5.44. The items on practice of home management and prevention of malaria were ranked as always, occasional and never, these were coded as 2, 1 and 0 respectively and summed up. Therefore, for the two levels of practice, the total obtainable mark was 58, the mean was 21.29 while the median was 21 and standard deviation was 6.17.

Level of Knowledge of causes, transmission and symptoms of malaria: The level of knowledge of the respondents on causes, transmission and symptoms of malaria was low, as 75% of them scored less than 40%, 22% scored between 40 and 59%, only 2.6% scored 60% and above. In describing malaria, 37.2% of the respondents opined that malaria illness is characterized by increased body temperature, fever, shivering and cold. Another 23.5% described it as fever, headache and body ache, only 2.6% described it as illness caused by mosquito (see table 2).On causes of malaria, 86.3% identified mosquito as cause of the disease, 33.6% linked malaria with bad water while 28% indicated that it is caused by working under the sun. Most of the respondents (84.5%) indicated that malaria can be transmitted when mosquitoes that are infected with *plasmodium falciparum* bite children. However, 17% opined that malaria can be transmitted by eating or drinking with the person having it, 16.7% indicated that it could be transmitted by sleeping in the same room with the person having it while 6.6% said wearing the cloth of the person having it could transmit the disease.

Table 1:
Demographic characteristic of the respondents

VARIABLE	Frequency	%
Age (years)		
15 - 24	124	14.6
25 – 34	421	50.5
35 – 44	224	26.7
45 – 54	39	4.6
55 and above	29	3.3
Marital status		
Married	776	92.7
Divorced	9	1.1
Single parent	15	1.8
Widow	37	4.4
Head of the Household		
Respondent	88	10.5
Husband	749	89.5
Educational status of the respondents		
No formal schooling	145	17.3
Primary school	252	30.1
Junior Secondary School 1-3	101	12.1
Senior secondary school 1-	267	31.9
3/Technical school / Grade 2	53	6.3
NCE/OND/ CHEW / School of Health Technology	19	2.3
1ST Degree/HND/ Nursing/ Environ health		
Occupation of the respondents		
Artisan	199	23.8
Civil/Public Service/ professional	38	4.6
Farming	71	8.5
Trading	439	52.4
House wife/ unemployed	86	10.3
Others	4	.4
Family structure		
Nuclear	617	73.7
Extended	220	26.3
Household characteristic		
Monogamous	637	76.1
Polygamous	180	21.5
Single parent	20	2.4
No of under-five children per mother	534	63.8
One	260	31.1
Two	43	5.1
Three		

Result of knowledge of symptoms of malaria shows that fever or hot body was picked by majority (94%) of the respondents, followed by inability to eat or suck breast (42.4%), feeling unwell (40.7%), general body weakness (35.7%), vomiting (30.2%), while the least was bitterness in the mouth (12.1%)

Level of knowledge of home management of malaria

Many of the respondents (64.9%) scored less than 40% in knowledge of home management of malaria, 34.9% scored between40% and 59% while 0.2% scored 60% and above. Very few respondents (6.9%) knew that giving of extra fluids is a form of home management of malaria among under-five children; while 36.8% respondents knew that children having malaria fever should be bathed with lukewarm or tepid water,(see table 2). More than half of respondents (64.3%) did not know the newly recommended treatment of malaria which is Arteminsin Combined Therapy (ACT) while 71.8% knew chloroquine tablets or syrup as medicine for treatment of malaria.

Level of knowledge of prevention of malaria

Knowledge level of the respondents in prevention was also low as 45.2% scored<40%, 33% scored between 40% and 59% and 21% scored 60% and above (figure 1 presents the three different levels knowledge). Few (16.2%) of the respondents were aware that draining of pot holes and pools of water that do not flow could help to prevent malaria. Similarly, only some (36.8%) of them knew that wearing of long sleeved cloth and trouser as well as using of long lasting insecticide treated nets (29.3%) are methods of preventing mosquito bites and malaria (See table 2).

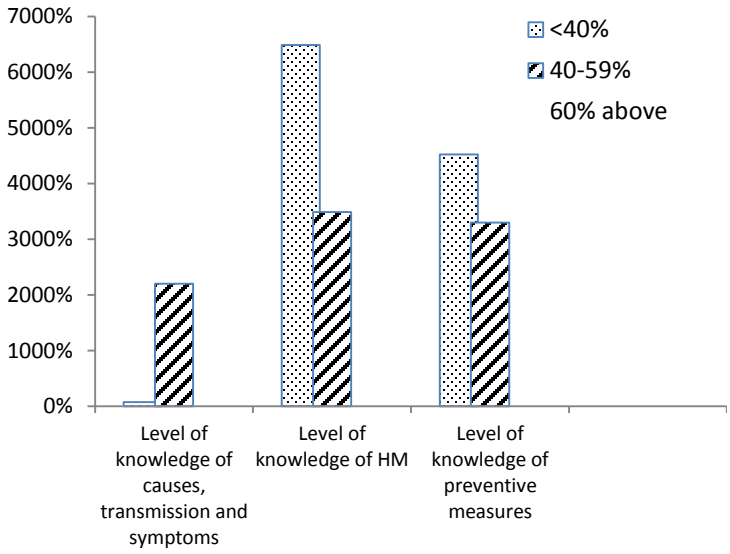

Fig. 1
Respondents' level of knowledge of malaria

Table 2:
Respondents' description of malaria illness, knowledge of home management and prevention of malaria

Description Of Malaria Illness	Frequency	%
Increase body temp/ fever/shivering/ cold	311	37.2
Fever, vomit, body weakness & refuse to eat	104	12.4
Fever, headache, refuse to eat & body ache	199	23.7
Caused by mosquitoes bites	22	2.6
Deadly disease	144	17.2
Yellow eyes & yellow body	15	1.8
Others	25	3.0
I do not know how to describe it	10	1.2
Actions Mother Can Take When Their Children Have Malaria Fever	**Frequency**	**%**
Expose the child and fan him/her	233	27.8
Bath the child with lukewarm or tepid water	308	36.8
Give the child extra fluid	58	6.9
Give the child medicines to treat malaria.	713	85.2
Give herbal preparations (agbo)	271	32
Take the child to health facility immediately	752	89.8
Take the child to pharmacy/patent medicine store	138	16.5
Take the child to traditional healer	19	2.3
Knowledge of Measures For Prevention Of Malaria	**Frequency**	**%**
Use of window and door nets.	482	57.6
Protecting oneself by wearing long sleeved clothes and full trousers.	308	36.8
Applying insect repellent.	24	2.9
Spraying the house with insecticide aerosol.	516	61.6
Using Long Lasting Insecticidal Nets (LLINs) / Insecticide Treated Nets (ITNs) everyday.	245	29.3
Destroying breeding sites of mosquitoes around the house.	381	45.5
Throwing away containers, broken pots, unused tyres where water collect and mosquitoes breed.	250	29.9
Cutting grasses around the house and the community.	480	57.3
Covering containers used for water storage.	236	28.2
Filling up pot holes and pools of water that don't flow.	136	16.2

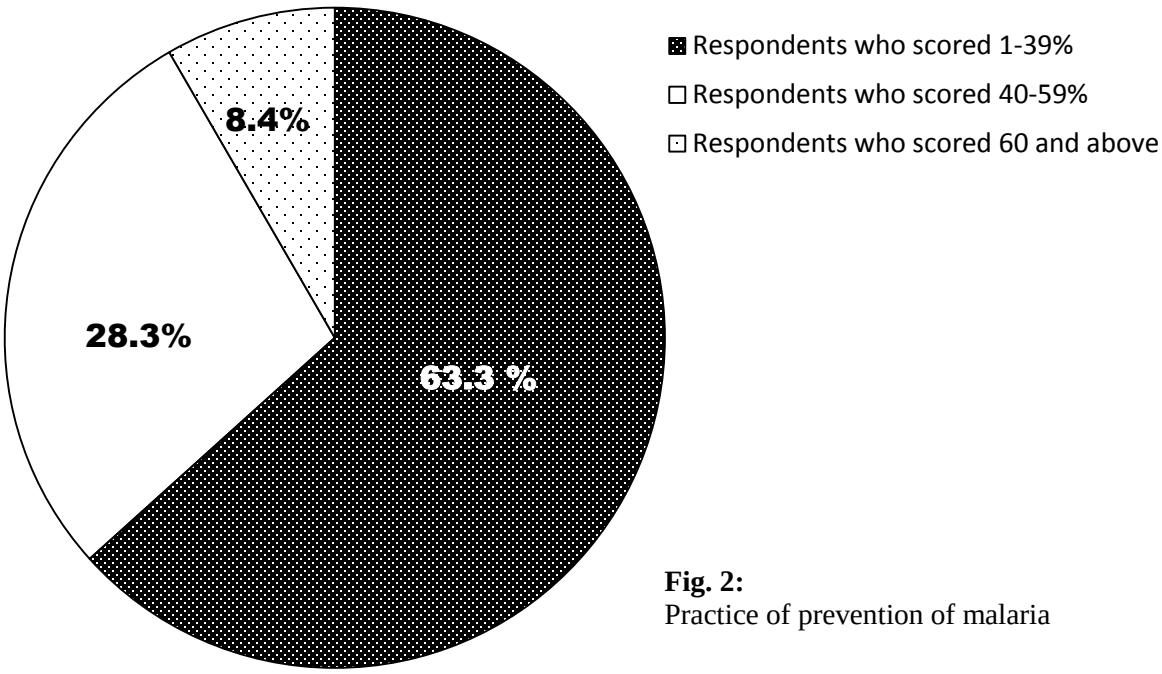

Fig. 2:
Practice of prevention of malaria

Level of practice of correct home management of malaria

The level of practices of correct home management of malaria by the respondents was also low, 97.7%of them scored <40% , 2.3% scored between 40% and 59% while nobody scored 60% and above. Many (64.4%) of the respondents reported that they always take their children to the health facilities within their communities, 62.1% always go to pharmacies and patent medicine vendors while 15.1% indicated that they had consulted traditional healers before for treatment of malaria .Majority of the mothers (95.8 %) reported that their children had had malaria fever before this study. Table 3 shows details of actions mother took when their children had malaria. The result of actions which mothers always take when their children have malaria fever shows that 12.8% exposed their children to fresh air, 23.1% bathed their children with tepid water, 3.3% gave extra fluid to their children, 62.4% gave antimalaria drugs while 54.2% gave *agbo* (herbal preparation) to the children.

Level of practice of prevention of malaria

Findings on practice of prevention reveal that 63.3% scored 1% - 39%, 28.3% scored between 40% and 59% and 8.4 % scored 60% and above (see figure 2). Majority (90%) of the respondents indicated that malaria is preventable but few (17.0%) of the respondents reported that they always protect their children from mosquito bites by wearing long sleeved clothes and full length trousers, 25.0% indicated that their children always sleep under long lasting insecticide treated net, about 10.5% drained pot holes and pools of water around their houses and 26.2% said they always throw away containers, broken pots, unused tyres that can serve as mosquito-breeding sites (See Table 3 and figure 2).

Factors associated with home management and prevention of malaria among mothers of under-five children.

Multinomial logistic regression analysis was performed to identify which of the factors were significant to the practice of home management and prevention of malaria. The factors that were examined include; length of stay in the study community, marital status, head of household, religion, age of respondent and spouse, education of the respondent and spouse, occupation of the respondent and spouse, household characteristic, household structure, family size and number of under-five children in the family.

Table 3:
Respondents' practices of home management and prevention of malaria

Actions Taken By Respondents When Their Children Had Malaria Fever	ALWAYS		OCCASIONAL		NEVER	
	F	%	F	%	F	%
Expose the child and fan him/her	107	12.8	188	22.5	542	64.8
Bath the child with lukewarm or tepid water	28	3.3	125	14.9	684	81.7
Give the child extra fluid	28	3.3	125	14.9	684	81.7
Give the child medicines to treat malaria	522	62.4	240	28.7	75	9.0
Give herbal preparations (agbo)	454	54.2	236	28.2	147	7.6
Take the child to health facility immediately	539	64.4	221	26.4	77	9.2
Take the child to pharmacy/patent medicine store	520	62.1	256	30.6	61	7.3
Take the child to traditional healer	76	9.1	50	6.0	711	84.9
	ALWAYS		OCCASIONAL		NEVER	
Preventive Measures	F	%	F	%	F	%
Use of window and door nets	403	48.1	0	0	434	51.8
Protecting oneself by wearing long sleeved clothes and full trousers	142	17.0	261	31.2	434	51.9
Applying mosquito repellent	18	2.2	18	2.2	801	95.7
Spraying of the house with insecticide aerosol	279	33.3	346	41.3	212	25.3
Using long lasting insecticidal nets (LLINs)/ Insecticide treated nets (ITNs) everyday	209	25.0	40	4.8	503	70.3
Destroying breeding sites of mosquitoes around the house	268	32.0	129	15.4	440	52.6
Throwing away containers, broken pots, unused tyres where water collect and mosquitoes breed	219	26.2	124	14.8	494	59.0
Cutting grasses around the house and the community.	285	34.1	174	20.8	378	45.8
Covering containers used for water storage.	242	28.9	42	5.0	553	66.1
Filling up pot holes and pools of water that don't flow.	88	10.5	83	9.9	666	79.6

All the factors were not significant in correct home management of malaria as the coefficient values ranged from -0.2 to2.1, *p*-value 0.17 to 0.78. However, in practice of prevention of malaria, length of stay in the study community (*p*- 0.0151), husband's age (*p*- 0.0207) and family structure (*p*- 0.0069) were statistically significant. The length of stay reduced the probability of the respondents being in good practice category. This means, based on the coding of the options that those respondents who spent between one and ten years in the study communities practiced good preventive measures than those who had stayed longer in the areas. Similarly, the older the age of the respondents' husbands, the higher the probability of the respondents being in good practice category. The family structure significantly reduced the probability of respondents being in good practice category suggesting that the nuclear families had good practice of preventive measures than the extended families.

In testing the hypotheses, it was found out that there was significant association between level of knowledge of causes of malaria, its transmission and symptoms and practice of correct home management of the malaria *p*-value =0.000. There was also significant association between level of knowledge of causes of malaria, its transmission and symptoms and practice of prevention of malaria was also significant at *p*- 0.000. The respondents' knowledge of preventive measures was significantly correlated (*p*- 0.000) with their practice of prevention.

DISCUSSION

The socio-demographic findings showed that half of the caregivers were within the 24 to 35 years age range, this conforms with many studies among the mothers (Ajayi 2005, Ebuehi and Adebajo2010) and is usually regarded as active reproductive age range for the females.

Findings from this study show that mothers did not possess enough information on home management and prevention of malaria. This study corroborates other studies that have documented poor understanding of causes, transmission and symptoms of malaria as well as home management and prevention of malaria among people living in the endemic areas particularly rural dwellers (Frey *et al* 2006, Ajayi *et al* 2008 Orimadegun 2010, Obrist *et al* 2010, Anumudu *et al* 2010). Majority of the respondents scored low in the knowledge of causes, transmission and symptoms (75% scored less than 40%) and home management (64.9% scored less than 40%). (See table 2). While answering question on what causes malaria, even though large proportion of respondents correctly identified mosquito as the vector of transmission, and like previous studies by Falade *et al* 2006 and Oyedeji *et al* 2009, many still believed other things like bad water or air, working in the sun, sleeping in the afternoon could cause it. This wrong opinion might have influenced the practices of the mothers in utilizing appropriate measures in treating or preventing the disease. Many of the symptoms of malaria could not be recognized by large proportion of the respondents; fever, inability to eat or suck breast, feeling unwell and bitterness in the mouth were highly recognized. Inability to recognize the symptoms may likely affect the respondents' treatment seeking behavior, seeking for wrong treatment at home or outside.

In corroborating the existing fact of high prevalence of malaria in this part of the world as documented by WHO 2006, Frey *et al* 2006, Obrist *et al* 2010,Oyedeji *et al* 2009 and Anumudu *et al* 2010, 95.8 % of the respondents indicated that their children had had malaria fever before. Majority of the mothers reported that they always take their sick children to pharmacies or patent medicine stores. This action may be as a result of unavailable 24-hour health service in the communities because each of the community had just one primary health centre except Iragberi that had one comprehensive health centre in addition. The closeness of the patent medicine stores to the communities is another factor that has contributed to their patronage. Similar finding was reported byAjayi *et al* 2003, Adeyemo 2003 and Eseigbe *et al* 2012. Few of the mothers who practiced home management principally gave paracetamol and chloroquine in some cases prior to consultation at the health facilities. This is similar to what obtained in other previous studies in such malaria endemic areas (Adeyemo 2003, Ajayi 2005, Ebuehi and Adebajo2010). Many of these mothers were not aware of the new recommended treatment of malaria i.e. Arteminsin Combined Therapy (ACT), this is of concern as dependency on old malaria treatment regimen may continue to promote chloroquine resistance phenomenon.

Large proportion of the mothers accepted that malaria can be prevented, yet none of the preventive measures was utilized by up to50% of the mothers. Personal protection like wearing of long sleeved cloth and trouser and environmental management were not well known and practiced by the mothers. As found by Amodu *et al* 2006 in their study, the commonly used individual preventive measures among the mothers were window and door nets, spraying of house with insecticide aerosol and mosquito coil. While the common environmental management measures among them include cutting of grasses around the houses and destroying of the mosquito breeding sites.

Even though majority of the respondents identified mosquito as cause of malaria but only very small percentage (2.6%)of the respondents associated malaria illness with effect of mosquito bites when they described malaria illness, this similar to findings of previous

studies in this environment by Ajayi 2005 and Falade *et al* 2006. The poor preventive practices could be a reflection of this poor association. These inadequacies might have been the reasons for poor practice of home management and prevention of malaria among the mothers. These conform to findings of previous studies conducted among rural dwellers in Nigeria and Sub Sahara Africa (Falade *et al* 2006, Oyedeji *et al* 2009 Abdisalan *et al* 2009, Ebuehi and Adebajo 2010).

The factors (advanced age of husbands and nuclear family) that were revealed to be significantly associated with prevention of malaria support normal human experience phenomena. Old age is closely related to life experience and usually an advantage to improve one's performance; no wonder advanced age of some of the husbands was associated with better preventive practice. Sometimes nuclear family may be likened to smaller family size particularly if such family is monogamous and reduced family size may promote quality living standard among family members.

Conclusion

Mothers of under-five children in this study manifested poor knowledge and practices of home management and prevention of malaria. These findings justify and support the need for intervention that will improve mothers' knowledge of transmission, symptoms and management of malaria. Such intervention should be community based in order to make it effective in the promotion of correct home management and utilization of preventive measuresat the household level particularly among mothers of under-five children.

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