IOSR Journal Of Humanities And Social Science (IOSR-JHSS)
Volume 21, Issue8, Ver. 8 (Aug. 2016) PP 01-07
e-ISSN: 2279-0837, p-ISSN: 2279-0845.
www.iosrjournals.org

Knowledge, Attitudes and Practices of Mothers of Under-Five Regarding Prevention of Malaria in Children: Evidence from ogun State, Nigeria

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Abstract :- Malaria is an infectious disease and a serious health issue that needs urgent attention especially in children less than 5 years. The study aims at assessing the knowledge, attitude and practices of mothers regarding the prevention of malaria in children between 0-5 years. Convenience sampling method was used to select 160 mothers that attend child survival clinic and children outpatient clinic in olabisi onabanjo university teaching hospital (OOUTH), sagamu, Ogun State. Questionnaire was used to collect data from the respondents, and the data was analysed using statistic package for social sciences (SPSS, version 17). Findings from the study showed that 55% of the respondents had a good knowledge about malaria, 78% of the respondents had a positive attitude regarding malaria prevention, 37% of the respondents practiced malaria prevention. The factors which influenced respondents' practice of prevention were the age of mothers, their income level and the frequency of malaria episode. Despite the fair overall knowledge and good attitudes, practices towards malaria prevention were poor. Therefore interventions aimed at social and behaviour change should primarily target the gaps in practices highlighted by the study.

Keywords - *Attitude, Knowledge, Malaria, Nigeria, Preventive practices, Under-five.*

I. INTRODUCTION

Malaria continues to be a leading cause of morbidity and mortality in many tropical regions of the world even though it is both preventable and treatable, and effective preventive and curative tools have been developed. Despite global efforts to eradicate the disease it remained a great challenge to health system for countries in the developing world. It is also a public-health problem and the principal cause of childhood mortality [1]. It is a vector-borne infectious disease caused by plasmodium. Malaria is widespread in tropical and subtropical regions in a broad band around the equator. It is prevalent in tropical and subtropical regions because rainfall, warm temperatures, and stagnant waters provide habitats suitable for mosquito to breed.

Five species of plasmodium can infect and be transmitted by humans, however, majority of deaths from malaria are caused by *plasmodium falciparum* while *plasmodium vivax, plasmodium ovale*, and *plasmodium malarie* causes a generally milder form of malaria that is rarely fatal. The zoonotic species, *plasmodium knowlesi* is prevalent in Southeast Asia; it causes malaria in macaques, but can also cause severe infections in humans. The disease causes symptoms that typically begin 8-25days following the infection, symptoms may occur later in those who have taken anti malaria medications as prevention. The classic symptom of malaria is paroxysm—cyclical occurrences of sudden coldness followed by rigor and then fever [2]. Severe malaria has varying patterns and the relative contributions to individual symptoms to mortality differ with endemicity, geographic locations and access to health services [3].

Malaria accounts for 20% of under-five mortality and 25% of childhood mortality [4]. According to Erhun, Agbani and Adesanya [5], over 90% of malaria cases occur in Sub-Saharan Africa, where a child under the age of 5 years dies from this illness every 30 seconds. In Nigeria, the burden of malaria is well documented and has been shown to be a big contributor to the economic burden of disease in communities where it is endemic and is responsible for annual economic loss to the tune of 132 billion Naira [6]. It is estimated that out of 300,000 deaths occurring each year, 60% of outpatient visits and 30% hospitalizations are all caused by malaria [7]. No doubt Nigeria is a malaria-endemic area and malaria is the principal cause of childhood mortality.

According to Wilson [3], global malaria deaths peaked at 1.82 million in 2004 and have fallen steadily since then, dropping by 32% to 1.24 million in 2010 (714,000 children aged less than 5 years, 524,000 individuals aged less than or equal to 5years). However, the number of deaths in individuals aged less than or

equal to 5 years in 2010 exceeded WHO estimates by 433,000. The situation has remained consistent ever since, this is why investigation on how to mitigate malaria spread among under-five is pertinent and of policy relevance. Uzochukwu et al. [7] stated that malaria is common among pregnant women and children under 5 years of age due to their low levels of immunity. This is why these categories of the population were the primary focus of the Roll Back Malaria (RBM) program. , RBM aims at maintaining an overall vision of a malaria-free-world. The goals and targets for malaria control was to reduce global malaria deaths to near zero by 2015, reducing global malaria cases by 75% from what it was in 2000 by end of 2015 and eliminate malaria by end 2015 in 10 new countries [8]. This goal is yet to be achieved.

The increase in the prevalence of malaria is Nigeria is due to both behavioural and non-behavioural factors [9]. The behavioural factors relates to some cultural practices, which promote mosquito breeding and mosquitoes' access to the people as well as the failure of 'at risk' population to use technologies proven to be effective for the treatment, control and prevention of malaria promptly and adequately. The non-behavioural factors include geographical or ecological peculiarities, the availability of mosquitoes and the presence of plasmodia. Thorough understanding of both behavioural and non-behavioural factors is very important for the design of appropriate interventions for tackling malaria [10]. Creating awareness and improving the understanding of the transmission of malaria has been found to greatly contribute to ameliorating malaria menace and facilitate the sustainability of malaria elimination programmes [8]. It is against this backdrop that this paper examined the knowledge, attitudes and practices of mothers regarding the prevention of malaria in children between 0-5 years.

II. METHODOLOGY

This study was carried out in Olabisi Onabanjo University Teaching Hospital (OOUTH), Sagamu, Ogun State in Nigeria. OOUTH, established in 1983, is a tertiary health institution owned and managed by the State government. The study specifically targeted women with children below five (5) years old attending the child survival clinic and mothers who attended the children out-patient clinic in the Teaching Hospital. According to the register, 200 mothers (with under-five children) attended child survival clinic while 50 mothers attended children outpatient clinic between August and September 2015 (period of data collection). Thus, a total of 250 mothers was the population of the respondents.

Following Yamane [9], the sample size was calculated from a population of 250 women with under-five children in the study area (monitoring &evaluation unit in Ibadan north east local government):

$$n=N/1+ \{N (e^2)\} \ldots\ldots\ldots (1)$$

Where: n=minimum sample size, N=total number of population (which was 250 for this study) and e=level of precision (e=0.05) which is constant. Thus, the estimated minimum sample size was 154 respondents however, a total of 160 mothers were randomly sampled, through balloting, to take care of poor responses.

Data collection was done using structured questionnaire. Information gathered included demographic, respondents' knowledge, attitude and practices with respect to malaria prevention in their children. Furthermore, the questionnaire was validated and subjected to reliability test using the Cronbach's Alpha test. Result of the test showed that the average Cronbach's Alpha value for all the constructs in the instrument was 0.88 which clearly indicated that the instrument was reliable. Data collected were analyzed using the statistical package for social sciences (SPSS version 17.0). Both descriptive and inferential statistics were employed to present results for the study. The consent of all the participants were sought prior to data collection and ethical clearance was obtained from Olabisi Onabanjo University teaching Hospital in Ogun state.

The logit regression model was employed to examine the factors that influence malaria prevention practices. For the purpose of this study, any of the four common and selected practices was conceived to reflect the adoption of preventive practice. The four major prevention methods identified were environmental sanitation, use of mosquito nets, use of mosquito repellant or spray and use of anti-malaria drugs. The model is specified as follows:

$Ln (P_i/(1-P_i)) = ß_0 + ß_1X_1 + \ldots + ß_{14}X_{14} + e_i$ …… Gujarati [12]

Where

The dependent variables are the natural log of the probability of adoption of a preventive practice (P_i) divided by the probability of not adopting ($1-P_i$), βo = the intercept, $ß_{1\ldots14}$ = regression coefficients, $X_{1\ldots14}$ = independent variables, and ei = error term..

The independent variables specified as factors affecting the adoption of preventive practice, and are defined below:

X_1 = Age (years)

X_2 = Income level per month (₦)

X_3 = Educational level (years)

X_4 = knowledge level

X_5 = Attitude

X_6 = Frequencies of malaria attack per year

III. RESULTS AND DISCUSSION

The results of the data analysis for this study are presented in this section. Results of respondents' socio-demographic characteristics, knowledge, attitude and preventive practices with respect to malaria are presented here.

3.1 Respondents' personal characteristics

Respondents' personal attributes analyzed included age of mother and child, marital status, level of educational, occupation type, religion and frequency of malaria cases (how often their children have had malaria episode). Results, as presented in Table 1, showed that most of the respondents were between 20 and 30 years old (73%) and mostly civil servants (36%). By implication, most of these women, being young, are expected to be new to child bearing and nursing, however, further result showed that 51 percent of the women have had previous births. This shows the likely existence of early marriage and child bearing in the study area. Most of respondents had relatively good level of education with majority having secondary education and above (84%). The nexus between education and health seeking behaviour has been detailed in previous studies [6, 13]. Thus their level of education is expected to influence their search for knowledge, attitude and practices regarding prevention of malaria in their children. Since most of the women are civil servants, they may not necessarily depend on their husbands for household financial sustenance and immediate care for their children, especially during emergencies. As at the time of data collection, some 54 percent of the respondents had children below 3 years of age.

Table 1: distribution of respondents by their personal characteristics

Variables	Frequency	Percentage %
Age:		
20 – 30	116	72.5
31 – 40	31	19.4
>40	13	8.1
Occupation:		
Civil servants	57	35.6
Traders	52	32.5
Student s	51	31.9
Religion:		
Christianity	201	78.1
Islam	169	21.9
Educational level:		
Primary	24	15.4
Secondary	96	59.6
Tertiary	40	24.8
Marital status: married	145	90.6
Child's age in years:		
1	40	25.0
2	47	29.4
3	44	27.5
4	29	18.1
Had previous births: yes	82	51.2
Frequency of malaria cases with my under-five children:		
Seldom	20	12.5
Moderate	54	33.8
Very frequent	86	53.8

Source: computed from field survey data (2015)

3.2 Respondents' knowledge of malaria infection and prevention

Respondents' knowledge regarding malaria infection and prevention were assessed and results presented in Table 2. Levels of knowledge regarding mode of infection and transmission, symptoms, prevention of malaria were measured following the Ashur [14] measurement scale. According to Ashur, proportion or score less than 40 percent correct response should be taken as indicator of low level of knowledge, 40 – 59 percent is considered average and 60 – 80 per cent is considered high, while over 80 per cent is regarded as very high level of knowledge.

Table 2: Distribution of respondents by knowledge of malaria infection and prevention

Variables	Frequency*	Percentage %
Ever heard of malaria	160	100
Heard of malaria prevention education messages	150	93.8
Source of information:		
Health workers	163	44.0
TV/Radio	81	21.8
Friends and family	78	21.1
Print media	56	15.1
No response	7	1.9
Knowledge of mode of infection and transmission:		
Mosquitoes bite transmits malaria	153	95.6
Cannot be contracted by children playing in the sun	77	48.1
Can be transmitted from another person with malaria	113	70.6
Dirty environment with stagnant water can enhance transmission	98	61.3
	Mean score = 68.9%	
Knowledge of symptoms		
Fever	156	97.5
Cold	56	35.0
Vomiting	118	73.8
Headache	77	48.1
General body weakness	83	51.9
Loss of appetite	91	56.9
	Mean score = 60.5%	
Appropriate preventive measures:		
Use of insecticide treated net	52	32.5
Use of repellant	77	48.1
Taking anti-malaria medication	55	34.4
Keeping the house and surrounding clean	36	22.5
	Mean score = 34.4%	
Overall score:	54.6%	
Mean score (Maximum scale measure = 14)	7.7 (±1.17)	

Source: computed from field survey data (2015) *multiple response

Results in Table 2 showed all the women have heard of malaria and almost all of them have heard of malaria prevention education message (94%) especially from the health workers. The result showed that the women had average knowledge level (mean score for correct response = 69%) for knowledge about mode of infection and transmission, however, almost 40 percent of the respondents did not know that malaria can be transmitted more easily in a dirty environment with stagnant water and overgrown grasses. This will likely influence the kind of preventive measure adopted by these individuals. Further result showed that women had average knowledge level (mean score for correct response = 61%) for knowledge about symptoms of malaria. Adequate knowledge of symptom will likely influence attitude and promptness to seeking treatment for children infected with malaria, thus preventing further spread to healthy ones. Respondents' level of knowledge regarding appropriate preventive measures to be taken to reduce malaria was low (mean score for correct response = 34%). Only 23 percent of the women knew that keeping the environment clean can prevent malaria spread. This result corroborates earlier result on mode of infection. The use of mosquito repellant as preventive measure ranked highest among respondents (48%). Similar results showing poor knowledge of Nigerian mothers regarding cause, symptoms and preventive measures for childhood diseases, despite the literacy level of these caregivers, have been reported by previous studies [6, 15, 16]. When all the knowledge statements were scored, with the right answer scoring 1 point and the wrong answer 0 point, an overall mean score of 7.7±1.17 was obtained out of a maximum scale measure of 14. This is just slightly above average score and inadequate to achieve appropriate healthcare practices. Studies have proved that improved knowledge of malaria and its source of transmission can promote preventive and personal protection practices amongst the affected community [17].

3.3 Respondents' attitude regarding prevention of malaria in under-five children

Result of respondents' attitude regarding prevention of malaria in their under-five children is presented in Table 3. The women were assessed for positive and negative attitudes. Generally, the respondents exhibited high 'positive' attitude towards prevention of malaria (78%) and low 'negative' attitude (39%). However, 67 percent

of the respondents favoured self medication. When both positive and negative statements are scored with the right answer scoring 4 points and the wrong answer 1 point following the likert scale, an overall mean score for attitude was determined to be 21.6±5.8 out of a maximum of 28. This result showed that the women in the study area see malaria as a serious health challenge for their under-five. This is expected to translate to good malaria prevention practices.

Table 3: Respondents attitude regarding prevention of malaria in under-five children

Attitudes statements	Frequency*	Percentage %
Positive statements:		
Malaria prevention is highly important in children because it is serious and life threatening	145	90.6
To prevent malaria me and my child must avoid mosquito bite	109	68.1
Sleeping under mosquito net is one way to prevent getting malaria	125	78.1
I might be at greater risk if my environment is overgrown with bushes	96	60.0
It is dangerous when malaria medicine is not taken completely	131	81.9
I believe that I should go to the clinic every time I suspect my child has malaria	140	87.5
	Mean score = 77.7%	
Negative statement:		
I can easily and cheaply treat myself and my baby if we have malaria	107	66.9
It is possible to recover from malaria without treatment so no need for serious need incurring preventive costs	24	15.0
People who have malaria should be isolated to prevent its spread	32	20.0
Only pregnant women and children are at risk of malaria so they are the only ones that need serious protection	88	55.0
	Mean score = 39.2%	
Overall Mean score (Maximum scale measure = 28)	21.6 (±5.80)	

Source: computed from field survey data (2015) *multiple response

3.4 Respondents' major malaria prevention measures/practices used for children

Respondents were further assessed based on the major prevention methods they use in reducing malaria attack on their children. The four major prevention methods identified were environmental sanitation, use of mosquito nets, use of mosquito repellant or spray and use of anti-malaria drugs. Results in Table 4 showed that for environmental sanitation, 87% perceived that the method was available but only 22% preferred this method for controlling malaria and only 30% were actually using it as at the time of the survey. For the use of mosquito nets, 58% perceived this method is available, 35% preferred using it above other methods and only 33% were currently using mosquito nets to prevent malaria episode. For the use of mosquito repellants, 75% of respondents perceived that the method was available but only 25% preferred this method for controlling malaria and some 49% were currently using it as at the time of the survey. For the use of anti-malaria drug, 70% perceived this method is available, 42% preferred using anti-malaria drugs to control malaria in their children but only 36% were currently using it. Generally the least perceived method available for preventing malaria attack and spread was the use of mosquito nets. However, more of the women preferred using nets to environmental sanitation (which is the least preferred method) and mosquito repellants. This means that despite the government efforts with distributing treated nets to pregnant mothers and mothers of under-five, under the Rollback Malaria policy, many of the mothers still do not have access to these nets. The most adopted method for preventing malaria in the study area is the mosquito repellant despite the fact that it is not the most preferred or most available and the possible cost implication. This may be because the respondents believed in prevention via vector control. This also shows their poor knowledge that mosquitoes can be controlled more effectively and cheaply via environmental sanitation and use of insecticide impregnated nets. This results is consistent with the findings of Schultz et al. [18]; Tsuyuoka, Wagatsuma and Makunike [19]and Erhun, Agbani and Adesanya [5].

Table 4: Distribution of respondents' by major malaria prevention measures/practices used for children

Practices	Environmental sanitation	Use of mosquito nets	Use of mosquito repellants	Use of anti-malaria drug	mean
Respondents' perceiving method as available	139 (86.8%)	93 (58.1%)	120 (75.0%)	112 (70.0%)	72.5%
Respondents' preferring method of prevention	35 (21.9%)	56 (35.0%)	40 (25.0%)	67 (41.8%)	30.9%
Respondents' currently using method of prevention.	48 (30.0%)	53 (33.1%)	78 (48.8%)	57(35.6%)	36.8%

Source: Computer from field survey data (2015).

3.5 Factors influencing malaria prevention practices

The regression result as presented in Table 5 showed that out of all independent variables, the coefficient of the age of the mothers ($p< 0.1$), income level ($p< 0.05$) and frequency of malaria episode ($p< 0.05$) were significant with appropriate signs. This implies that mothers' income and frequency of malaria episode increases the probability of the respondents' using one or more preventive measure to control malaria. The coefficient for the age of the respondents ($p< 0.1$) was significant with a negative sign showing an inverse relationship between age and the probability of the respondents taking preventive measure. This implies that older women show less interest in the prevention of malaria. This result is consistent with the findings of Babalola et al. [6]. It is not surprising that knowledge and attitude of the respondents did not significantly influence their prevention practices even though these variables were expected to influence prevention practices. Judging from earlier descriptive results, they have overall relatively good knowledge and positive attitude yet only 37% were currently using any prevention. This result is similar to the investigation of Batega [20] in Uganda on knowledge, attitude and practices related to malaria prevention and control which found out that despite high levels of knowledge and positive attitudes towards prevention of malaria, the practice of malaria preventive methods is generally low.

Table 5: Factors influencing malaria prevention practices

Independent variables	Beta coefficient	t-ratio
Constant	.353	2.957
Age of mother	-0.091*	1.856
Educational level	0.598	1.214
Income level	0.067**	2.220
Knowledge level (score of responses)	1.045	1.064
Attitude (score of responses)	0.101	1.003
Frequency of malaria episode	0.394**	2.297

Significant at 10% level **significant at 5% level; Psuedo R^2 = 0.72; Log likelihood = -42.310*

Source: Computer from field survey data (2015).

IV. CONCLUSION AND RECOMMENDATION

The study aimed assessed the knowledge, attitudes and practices of mothers of under-five in relation to malaria prevention in Ogun state, Nigeria. In general, most of the respondents had fair knowledge about malaria transmission and symptom but poor knowledge regarding prevention and control. Despite the fair overall knowledge and good attitudes, practices towards malaria prevention were poor. Therefore interventions aimed at social and behaviour change should primarily target the gaps in practices highlighted by the study.

Based on the findings in this study, the following issues should be considered for improving preventive practices against malaria among mothers of under-five in the study area and in Nigeria in general:

1. Special attention should be focused on improving respondents' knowledge about appropriate preventive measures for controlling malaria. Appropriate educational intervention that addresses the gap in knowledge as highlighted in the study, to corroborate the health information these women receive from the clinic is imperative.
2. While more efforts should be made to make the mosquito treated nets more available and cheaply accessible and even free to women attending clinics, healthcare programmes should incorporate women empowerment schemes so as to enhance their ability to meet cost of healthcare.
3. Community healthcare service providers should include in their services the counsel of communities on the importance of environmental sanitation

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