TREATMENT-SEEKING BEHAVIOUR OF MOTHERS FOR CHILDHOOD MALARIA IN NASARAWA STATE, NORTH CENTRAL NIGERIA.

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Abstract

Malaria is one of the primary causes of mortality in children under the age of five years. It is within the context of the need to understand the role of mothers in the treatment of children suffering from malaria in Nasarawa state that this study was carried out to contribute towards the formulation of recommendations for tackling these problems. A multi-stage systematic random sampling technique was adopted and a pre tested structured questionnaire was administered to 1416 representative respondents from six local government areas. Multivariate logistic regression was used to identify the major predictors of appropriate treatment seeking-behaviour. The study findings showed that there are two groups of healthcare providers in the study area; the modern western health and the traditional healthcare practitioners. There were also those who combined traditional medicine with modern medicine. Chemists and local shops were the commonest (81.3%) sources of help when children have malaria. Mothers who were civil servants were 40.4 times more likely to prefer hospital or dispensary for treatment of childhood malaria than those who were into other occupations. Urban mothers were 35.5 times more likely to seek for treatment within 24 hours than rural mothers while mothers with high and medium knowledge of malaria prevention were 36.3 and 6.3 times respectively more likely to report the use of bed-nets than those with low knowledge of malaria prevention. Urban mothers were 3.2 times more likely to use bed-nets as a strategy to avoid malaria in children than their rural counterparts. The study concludes that since local shops/chemists are the most common source of treatment for childhood malaria in the study area, there should be a focus on improving the quality of services that they deliver, through training and effective regulations.

Keywords: Malaria, treatment, mortality, children

INTRODUCTION

Although malaria is a controllable and preventable disease, it remains among the leading causes of mortality and morbidity in Nigeria. The importance of use of bed-nets, early diagnosis and prompt treatment with hospital prescribed drugs and effective home management to control malaria is well established; however, these, in part depend on how care-givers of children make their decisions when family members have suffered from malaria.

It is well documented that malaria is among the major causes of morbidity and mortality in developing countries, especially among young children. About 3.3 billion people are at risk in 109 countries and territories around the world and most of them in African children. According to the *World malaria report 2011*, there were 216 million cases of malaria and an estimated 655,000 deaths in 2010. The World Health Organization (WHO, 2010) estimated that one million people in Africa die from malaria each year and most of these are children under five years old.

In Nigeria, the Federal Ministry of Health (FMOH, 2005) reported malaria as a major public health hazard in the country and is transmitted to more than 90% of the population. It accounts for 60 percent of outpatient visits and 30 percent of hospitalizations among children under five years of age. With a population of over 150 million people, Nigeria accounts for one-quarter of all the cases of malaria in Africa and there are more deaths due to malaria in Nigeria than any other disease (WHO,

2010). Approximately one in six children dies before their fifth birthday and the yearly economic loss due to malaria in Nigeria has been put at 132 Billion Naira in terms of costs of treatment and transportation, loss of man-hours, absenteeism from schools and other indirect costs(FMOH,2005).

Nasarawa state government, realizing the threat posed to the health of the citizens by malaria, has allocated resources over the years to its control and eradication. These resources have been expended on sanitary inspection, residual spraying and increased supply of drugs to government hospitals and clinics. Yet, in spite of all these, in 2010, the Roll Back Malaria (RBM) reported that efforts at controlling the disease have not recorded significant progress in the state. N.P.C, *et al*. (2012) also reported that malaria in the North Central Geo-Political Zone-which Nasarawa state is part, is endemic and perennial. This is suggestive of the need to focus on the state to ascertain the community treatment-seeking behavior of the disease, including how it can be prevented and eradicated.

While it is true that government efforts at controlling malaria are constrained by limited financial and human resources, coupled with the presence of conducive atmosphere for the breeding of mosquitoes, it is equally true that there is wide spread illiteracy particularly in the rural part of the State. Thus, considerable number of people may still harbour misconceptions about malaria with great potential for negative consequences on the treatment of the disease. The mere presence of a conducive environment for the breeding of mosquitoes would not have necessarily resulted in high prevalence of malaria if people are sufficiently informed and have positive beliefs and attitude towards malaria control (Yin, 2006).

In the past, particularly among the rural residents of Nasarawa state, herbal medicine and occult consultation with herbalist were probably the normal approach to solving most health problems (Asoka, 2006). These beliefs and practices which may constrain the control of malaria are still very common. However, whatever may be the level of adherence to tradition on disease control among mothers in the State, we expect variations in people's behavior patterns or shifts away from the traditional practices and expectations among the people. Thus, success in controlling malaria depends on understanding the treatment-seeking behaviour at household level, which has implications for policy on the promotion of healthcare services and utilization. This study examines behavior of mothers with regard to decisions they make in seeking treatment for malaria illness in children under five.

METHODOLOGY
The study area
Nasarawa State is one of the 36 States in the Federal Republic of Nigeria which came in to existence on the 1st october,1996.The State lies between latitude 7º 45'and 9º 25' N of the equator and between longitude 7º and 9º 37 E of the Greenwich meridian. It is situated in the North-Central geo-political Zone of Nigeria, otherwise known as the Middle Belt region. It has a land area of 27,116.8 square kilometers with a population of 1,863,275 according to 2006 provisional census figure. The State has many ethnic groups and while it is difficult to draw out a neat ethnic map of the State, several villages are predominantly one ethnic group. The settlement pattern of the ethnic groups overlap owing to common neighborhood, farmlands, intermarriages and other forms of cultural and inter group relations.The major ethnic groups include Eggon, Mada, Alago, Rindre, Gwandara, Koro, Gbagi, Ebira, Agatu, Bassa, Aho, Mama, Ake, Arim, Kanuri, Tiv, Hausa, Fulani and Nyankpa.

Temperature is generally high in Nasarawa state. The rainy season runs from April through November. Temperatures in the state reached their maximum of 39^{0}C in March while the

mean monthly temperatures range from 26.8^0C in the southern part of the State to 27.9^0C in the northern areas. The state is well endowed with enormous water resources, both surface and underground and is drained by many rivers whose sources are mostly from the North Central Plateau. The regime of the rivers is characterized by seasonal variations. The climatic and ecological conditions also favour high malaria transmission potential. The temperature condition provides optimal conditions that lengthen the life-span of mosquitoes and increase the frequency of blood meals taken by the female Anopheles mosquitoes. The average rainfall of 328 mm/year and the humid conditions offer favourable breeding places and are conducive to the survival and activity of Anopheles mosquitoes. Flooding from the rivers occasionally occur in the state which leave behind marshes from which mosquitoes responsible for malarial illness breed. The state year 2010 disease surveillance report revealed that malaria is the major cause of morbidity (164,507) and mortality (332). The state has a doctor population ratio of 1:9,699; nurse to patient bed of 1:1,488; and Pharmacists to population ratio of 1:14,207.

Study Design and Data Collection
The major data source was primary gathered from mothers, aged 15 - 49 years with at least a child less than five years old in Akwanga, Lafia, Karu,Nasarawa, Nasarawa Eggon and Keana Local Government Areas(LGAs) in Nasarawa state.The study population was contacted through a multistage systematic sampling procedure. In the first stage was the stratification of the state into Senatorial Districts; two LGAs were systematically selected in each of the senatorial districts. This systematic sampling exercise resulted in the selection of Nasarawa and Karu LGAs in Nasarawa West Senatorial District; Nasarawa Eggon and Akwanga LGAs in Nasarawa North Senatorial District and Keana and Lafia LGAs in Nasarawa North Senatorial District. In the second stage; each LGA was further stratified

into urban and rural areas. Each local government headquarters was categorized as urban and was stratified into three residential zones. These are the high, medium and low class areas;based on the socio-economic attributes/status of their residents. The third stage was the selection of settlements and respondents in the LGAs using the updated version of the 20006 National Population EAs. A total of six EAs in each LGA were purposively and systematically selected (3 urban and 3 rural) giving an overall total of 36 EAs sampled for the study. Sampling at the EA level proceeded with the listing of all the buildings in the EA and thereafter the selection in each EA at specified intervals of either every third or fifth building from a starting number (determined randomly) depending on the length of the street or on the total number of houses on each street or area. A total of 1,416 mothers participated in the study.

Simple descriptive statistics was used to analyze the data while multivariate logistic regression was used to determine the predictors of appropriate and the recommended treatment-seeking pathway. As with the tradition in multivariate analysis, data were transformed prior to determining the relationships between appropriate treatment-seeking and the background characteristics and knowledge of malaria symptoms and prevention. The variables were transformed into indicator or dummy variables and in line with logistic regression design for this study, this was achieved by assigning a code of 1 for indicator variable (usually one variable) and code 0 for other variables of the same category (e.g. recommended treatment-seeking was assigned 1 and 0 not recommended treatment seeking).
The dependent variables included in the model were the appropriate treatment for malaria, which are:
1.   Using a hospital or clinic healthcare provider for treatment of malaria.

2. Seeking care within twenty four hours of noticing symptoms.
3. The use of bed-nets as malaria preventive strategy.

The independent variables are; Background characteristics (Urban and rural status, age, religion, educational status, income, occupation, marital status, number of children and number of children under five years) and knowledge of malaria symptoms and prevention.

Relationship in the data was determined through multivariate analysis as indicated below:

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + ...b_kX_K \text{ --------------------------------1}$$

Where:

Y = the predicted or estimated value of Y: Treatment seeking behaviour
a = the Y intercept
X_1 = the independent or explanatory variables (i =1, 2,3,4,5.....K): Background characteristics and knowledge of malaria symptoms and prevention.
b_1 = the partial slope of each independent variable (that is, the amount of change in Y for each unit of change in Xi, holding the other independent variable constant).These bi's are also known as the unstandardized regression coefficients. They show the amount of change in Y that results from one Xi, after the influence of other Xi's has been removed (i=1, 2...K)
K = the number of independent variables.

The regression parameters were estimated using the least squares approach. It was used in this study to minimize the sum of the squares of the errors made in solving every single equation (Sokoya, 2007). In this study for instance, the appropriate treatment-seeking behaviour is a function of the background characteristics of respondents and knowledge of malaria symptoms and prevention

$$f(F_i, k) = kF_i \text{ ---2}$$

Where F is the independent variables used in the study (background and Knowledge of malaria symptoms and prevention).

To estimate the variables k, a series of n measurements with different variables produced a set of data $(F_i, y_i), i = 1, n$, where y_i is appropriate treatment-seeking behavior.

Ethical Considerations

The safety of the respondents was of paramount interest to the study and oral consent from the respondents was sought directly while in some cases because of cultural considerations, the husbands consent was sought and obtained before the mothers participated. The study made efforts to collect ethical clearance in the state, but it was non-existent.

RESULTS

Table 1 reveals that 3.7% of the respondents were aged 15-19 years, 13.3% were aged 20-24 years and 25.8% were aged 25-28 years.

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Table 1: Socio-economic and demographic characteristics of respondents

Characteristics	Variable	Frequency	Percentage
Age group	15-19	53	3.7
	20-24	189	13.3
	25-29	366	25.8
	30-34	473	33.4
	35-39	214	15.1
	40-44	90	6.4
	45-49	31	2.2
Educational status	No formal education	347	24.5
	Primary	323	22.8
	Post primary	571	40.3
	Tertiary	165	11.7
	Others	10	0.7
Religion	Christianity	712	50.3
	Islam	636	44.9
	Traditional	63	4.4
	Others	5	0.4
Ethnic group	Eggon	310	21.9
	Mada	220	15.5
	Alago	275	19.4
	Hausa	158	11.2
	Ebira	97	6.9
	Gbagi	96	6.8
	Afo	110	7.8
	Fulani	56	3.9
	Others	94	6.3
Occupation	Farming	267	18.9
	Business/Trading	479	33.8
	Civil Servants	328	23.2
	Housewife	328	23.2
	Others	14	1.0
Income per month(in Naira)	Below 5,000.00	464	35.3
	5,000.00-10,000.00	449	34.2
	10,100.00-15,000.00	197	15.0
	15,100.00-20,000.00	77	5.9
	20,100.00-25,000.00	47	3.6
	25,100.00-30,000.00	26	2.0
	30,100.00-35,000.00	28	2.1
	35,000.00-40,000.00	10	0.8
	Above 40,000.00	15	1.2
Marital status	Married	1323	93.4
	Single parent	25	1.8
	Others	68	4.8
Number of children	1-2	535	37.8
	3-4	595	42.0
	5-6	257	18.2
	7-8	29	2.0
Number of children under five years	1	542	38.3
	2	829	58.6
	3	44	3.1

Source: Author's field work, 2011

Majority(33.4%) of the respondents were aged 30-34 years,15.1% were aged 35-39 years,6.4% were aged 40-44 years while only 2.2% were aged 45-49 years. The educational status of the respondents indicated that majority (40.3%) had post primary education, 24.5% had no formal education, 22.8% had primary education and 11.7% had tertiary education; while 0.7% had other forms of education. About half (50.3%) of the respondents were Christians, 44.9% were Muslims, 4.4% were traditional worshippers and 0.4% had other forms of religion. The ethnic groups of the respondent's show that 21.9% were Eggon, 15.5% were Mada, 19.4% were Alago, 11.2% were Hausa, 6.9% were Ebira, 6.8% were Gbagi, 7.8% were Aho, and 3.9% were Fulani while 6.3% were other tribes. One third (33.8%) of the respondents were into business/ trading, 18.9% were farmers, 23.2% each were civil servants and housewives while only 1.0% had other forms of occupation. The income distribution of the respondents showed that about 84.5% of the respondents earn ₦15, 000.00 and below monthly. This is generally low given the present economic situation in the country. Majority (93.4%) of the respondents were married, 1.8% were single parents while 4.8% were in to other forms of marriages. About 37.8% of the respondents had between 1 and 2 children, 42% had between 3 and 4 children, 18.2% had between 5 and 6 children while only 2.0% had between 7 and 8 children. Majority (58.6%) of the respondents had 2 children less than five years, 38.3% had a child less than five years and 3.1% had 3 children less than five years.

Table 2: Health care provider visited for treatment of childhood malaria.

Steps taken	Health care provider visited	Frequency	Percentage
Health care provided visited	Dispensary/ hospital	140	10.9
	Chemist/Local shops	1072	83.3
	Traditional	75	5.8
	Total	1287	100
Steps taken after hospital treatment failed	To the traditional healer	2	4.4
	To the same dispensary/hospital	6	13.4
	To another dispensary/ hospital	37	82.2
	Total	45	100
Steps taken after chemists treatment failed	Stayed at home	2	0.5
	To the dispensary/ hospital	395	98.8
	Went to traditional healer	3	0.7
	Total	400	100
Steps taken after traditional treatment failed	Stayed at home	2	3.1
	Went to dispensary/hospital	60	92.3
	To another traditional healer	3	4.6
	Total	65	100

Source: Author's field work, 2011

Table 2 shows that the last time respondent's children had malaria, majority (83.3%) visited chemist/local shops, and 10.9% visited a hospital/dispensary while only 5.8% sought for traditional treatment. When probed to know what steps were taken when treatment at the dispensary or hospital failed (table 2); 13.4% reported they visited the same clinic or hospital

while majority (82.2%) visited another clinic/hospital. When the child did not get relief after the clinic or hospital treatment only 4.4% visited a traditional health care provider. A further look at the table revealed that 95.6% of the respondents still visited a clinic or hospital. This is an indication that the study respondents view the diagnosis and medication at the hospital as the most reliable and convenient way for successfully detecting and treating malaria in children. It also indicates that it is only when the child's mother or members of the child therapy management group are convinced that the problem cannot be identified or completely treated, that they consider consulting a traditional healer. A further look at table 2 shows that majority of the respondents that visited a hospital or dispensary received effective treatment for their children since only 45 out of the 140 that visited the health care facility reported failed treatment. It could even be that the majority of those who reported failed treatment were those that visited the dispensaries and which their personnel are considered less knowledgeable and lack medical facilities compared to the general hospital.

When probed what steps were taken after seeking treatment at chemist and treatment failed; majority (98.8%) of the respondents visited the hospital or dispensary. This again, is an indication that the respondents view medication at the hospital as the most reliable and effective. The table also shows that 400 out of the 1072 respondents that visited chemist for treatment when their child had malaria reported that the treatment failed. This indicates that medication at the chemist and local shops is not very effective.

Respondents who reported traditional health care as their source of help when their child had malaria were asked, after using the traditional healer and the child did not get relief what they did(table 2);majority (92.3%) took the child to a clinic or hospital. This suggests that the usual pattern for those that consult traditional health providers is the use of herbal treatment as a starter and then a follow up with modern medicine when that failed. Only 4.6% took the child to another traditional healer while 3.1% stayed at home without taking any further action. Those that stayed at home when traditional treatment failed attributed it to lack of money or property with which to secure a loan to pay for health care again. The only remedy was resorting to prayers and other remedies at home.

Table 3 reveals that respondent's knowledge of symptoms of malaria in children is generally high (70.1%). Only 23.6% and 6.3% had medium and low knowledge respectively. The table also shows that knowledge of malaria prevention was skewed towards medium (43.9%) among the respondents. Only 35.2% had high knowledge while 20.9% had low knowledge. The table shows that 98.6% of children use bed-nets in their homes. This shows that majority of the people who are at greatest risk of severe malaria-the children use bed-nets. Overall, 54.0% of the respondents take their children suffering from malaria to a treatment centre within 24 hours.

Multivariate Analysis predicting appropriate treatment-seeking for malaria

Results of the multivariate logistic regression models fitted into the dataset and the odd ratios predicting appropriate treatment seeking for childhood malaria is presented in 4. The message of proper treatment of malaria in children emphasized the treatment of the disease using the health centre or hospital resources as recommended by World Health Organization.

Table 3: Selected variables of treatment-seeking for childhood malaria

Variable	Characteristics	Frequency	Percentage
Knowledge of malaria symptoms	High	441	70.1
	Medium	334	23.6
	Low	89	6.3
Knowledge of malaria prevention	High	480	35.2
	Medium	598	43.9
	Low	285	20.9
Use of bed-nets	Yes	1150	98.6
	No	266	1.4
Locality status	Urban	713	50.3
	Rural	703	49.7
Treatment within 24 hours	Yes	764	54.0
	No	652	46.0

Source: Author's field work, 2011

It also emphasized that sick children should receive care and treatment promptly within 24 hours and should use bed-nets. Reporting at or visiting a hospital or dispensary, taking prompt decision when malaria symptoms are noticed in children and using a bed-net to avoid malaria were considered an indicator of appropriate and good treatment-seeking behavior among the mothers. These three attributes, which are central to treatment of malaria in children, are promoted in malaria control intervention. These behaviors were analyzed to see if it was significantly related to respondent's knowledge of malaria symptoms and prevention and to contextual and background characteristics. Table 4 presents the result of multivariate analysis: Odd ratios from logistic regression models predicting the likelihood that a mother was using a bed-net, seek treatment in hospital or dispensary and promptly. The result shows that occupation is a significant predictor of seeking treatment at a hospital or dispensary. Those who were civil servants (.005) were 40.4 times more likely to prefer hospital or dispensary for treatment of childhood malaria than those who were into other occupations. The remaining variables, knowledge of malaria symptoms and prevention, locality status, religion, educational status, income per month, mother's age and marital status did not exert any influence on expressing treatment seeking in health center for treatment of childhood malaria.

Locality status is also a significant factor in seeking treatment within 24 hours or promptly for a child when he/she is attacked by malaria. Mothers residing in urban areas (.000) are 35.5 times more likely to seek for treatment within 24 hours than rural mothers. This implies that seeking treatment for children with malaria promptly is not sufficiently understood by rural mothers and they should be targeted for intervention. There was no sufficient evidence to show that other variables like education, age, religion, occupation, marital status, knowledge of malaria symptom and prevention were positively related to this action. The use of bed-nets remains critical to protective practices. The table also shows that mother's knowledge of malaria prevention and locality status are significant predictors of the use of bed-net as a preventive strategy for childhood malaria. Mothers with high (.000) and medium (.000) knowledge of malaria prevention were 36.3 and 6.3 times respectively more likely to report the use of bed-nets than those with low knowledge of malaria prevention. Urban (.000) mothers are 3.2 times more likely to use bed-nets as a strategy to avoid malaria in children than their rural counterparts.

Table 4: Odd ratios from logistic regression models predicting treatment-seeking behaviour for childhood malaria.

Variable	Categories	Seeking treatment at hospital/clinic	Use of bed-net as preventive strategy	Prompt treatment
	High	0.51	1.35	0.59
	Medium	0.36	1.62	0.34
	Low(r)	1.00	1.00	1.00
	High	0.99	36.3*	1.22
	Medium	0.95	6.3*	0.75
Locality status	Urban	2.19	3.2*	35.5*
	Rural(r)	1.00	1.00	1.00
Occupation	Farming	3.72	1.03	0.04
	Business	3.17	1.27	0.01
	Civil servants	40.4*	1.18	0.05
	Housewife	3.25	1.88	0.33

Source: Author's field work, 2011.

*Odds ratio, Significant at *P <=0.05 that control for selected background characteristics; locality status, religion, educational status, income per month, mother's age, number of children, number of children under five years and marital status**;** r** = reference category in the logistic regression model.

DISCUSSION

Mothers seek for help from a variety of sources of which chemist and local shops is the commonest. Only 10.9% visited a dispensary or hospital and 4.3% consulted a traditional healer. This indicates minimal use of formal government-supported or private health care providers for malaria diagnosis and treatment. This finding, as in many malaria-endemic areas of the developing world, reveals that self-medication for malaria for children appears wide-spread and common in the study community. This finding supports self-treatment using drugs bought from patent-medicine dealers and shops that is common in Nigeria and other developing countries(Erhun and Osagie, 2004; Khumbulana,*et.al*., 2009; Sumba,*et.al*.,2008; Chibwana,*et.al*., 2009 and Jessica, *et.al.,* 2012).

The preference for chemist/drug shops is not surprising because the study area is replete with patent-medicine stores and itinerant drug providers and these provide access to treatment that is generally closer and cheaper (both in terms of consultation fees and transport costs)

than that available from the formal healthcare system. The general preference for the chemists/drug shops over other treatment sources perhaps would not be a problem if the treatments provided were effective. However, even though the chemist and local shops were the commonest source for malaria treatment, the illness is considered best treated by modern health services by most respondents while a few considered it best treated by traditional methods, and often a mixture of both is sought. Convulsion was often not associated with malaria in this study, and traditional healers were more likely to be consulted in such cases. However, the relatively minimal use of traditional healers for treatment of malaria observed in this study was also reported by Okeke and Okafor (2008); Oyewole and Ibidapo (2007); Syed *et al*. (2009); and Chibwana *et al*. (2009).

Generally, traditional healers play a very important role in the health care delivery in the study area. Those who preferred traditional treatment believe that herbal treatment is more

effective. But it is considered uncertain in some cases. The uncertainty has resulted in the combination of both modern and herbal treatments in curing children. This was also reported by Nsungwa-Sabiliti *et al.* (2007) in Kasese in Western Uganda where some caretakers indicated that they would take some of their children for western medicine and others for traditional medicine. The two patterns are noticed in this study: some use herbal treatment as a starter and then a follow up with modern medicine when that failed and vice versa. The type of treatment adopted first, however, depends on the perceived cause of malaria and its severity. However, for malaria perceived to be serious, respondents prefer the orthodox health facility as the first resort.

Effectiveness of treatment was emphasized by those who preferred treatment-seeking at the hospital or clinic (public or private health facility).There were two important notions reflected in their preference; the role of appropriate malaria treatment with the capacity to conduct diagnostic investigation, and the role of 'physicians' to strengthen maternal capacity to positively respond to child malaria. The finding that laboratory confirmation of malaria is appreciated by the study community is interesting especially given the symptomatic overlap of malaria with other conditions (Akogun, 2003). This is because laboratory-based diagnosis can improve the rational and appropriate treatment of malaria and ultimately reduce healthcare costs (Jane *et al.*, 2010).

Overall, a positive finding was that most (54%) respondents consult a health care provider within 24 hours if they notice symptoms of malaria in their children. This findings in this study like in most African countries are far below the Roll Back Malaria (RBM) partnership target of ensuring that 80 percent of those suffering from malaria have prompt access to, and are able to correctly use, affordable and appropriate treatment within 24 hours the year 2010 (Cohen *et al*., 2012).Perhaps the proportion of those that delay in consultation with a health care provider should be educated on how to recognize and treat uncomplicated malaria in children at home.

Odd ratios from logistic regression model reveal the importance of occupation in seeking treatment at a hospital or dispensary. The findings that civil servants were 40.4 times more likely to prefer hospital or dispensary for treatment of childhood malaria than those who were into other occupations is also reported by Rutebemberwa *et al.* (2009) in eastern Uganda. The finding further underscores the need for employments of women so that it will assist them afford hospital services. The findings that locality status is also a significant factor in seeking treatment within 24 hours or promptly, for a child when attacked by malaria is critical to treatment seeking-behaviour. Mothers residing in urban areas are 35.5 times more likely to seek for treatment within 24 hours than rural mothers. A similar result has been reported in other studies (Aurelien and Richard, 2008; Paulander *et al.*, 2009).The finding indicates the need for improvement of rural mother's knowledge of seeking treatment for children with malaria promptly.

The findings that mother's knowledge of malaria prevention and locality status are significant predictors of the use of bed-net as a preventive strategy for childhood malaria also underscores the use of bed-nets as very critical to malaria protection. Mothers with high and medium knowledge of malaria prevention reported the use of bed-nets more than those with low knowledge of malaria prevention. Also, urban mothers were more likely to use bed-nets as a strategy to avoid malaria in children than their rural counterparts. This is similar with a study in Mwanza-Neno District in Malawi (Chibwana *et al*., 2009).To this end, mothers with low knowledge of malaria prevention and those residing in the rural areas should be equipped with relevant information via awareness campaigns and encouraged to use bed-nets for children.

CONCLUSION AND RECOMMENDATION.

Since patent-medicine dealers are the most common source of treatment for childhood malaria in the study area, there should be a focus on improving the quality of services that they deliver, through training and effective regulations. This is more so that these categories of treatment providers are considered not too knowledgeable and poor at providing appropriate advice, adequate doses of the appropriate drugs, or even the correct drug for the problem (Jane *et al.*, 2010). Training of chemists/shop operators as a channel of information to the community is necessary because it is likely to have a significant beneficial impact. A sustainable community-based system for the distribution of antimalarial drugs through the use of community health workers, particularly village malaria workers, mother coordinators, pharmacists, trained drug sellers, and shop owners would be helpful. Measures to promote correct self-treatment practices require an effective educational campaign, and people should be made aware of the dangers of misuse of drugs.

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