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## Malaria related knowledge attitude and practices (MKAP) in fourteen communities in Benue state North Central Nigeria: Evidence for the Success of focal malaria control intervention programmes

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### Abstract

A descriptive cross-sectional research was conducted in fourteen communities to investigate the people's perception of causes, signs, symptoms, preventive measures against malaria and their treatment seeking behaviour. 390 semi structured questionnaires were distributed to persons of age 15 and above in the study communities. A substantial number 84% of the respondents attributed the cause of malaria to mosquito bites, 20.7% attributed the cause of malaria to bad or dirty water while 6.4% said malaria is caused by witchcraft. On signs and symptoms 74.3% of the respondents recognized headache, 64% high temperature as the major sign and symptom of malaria while 54.3% mentioned change in eye colour. There was a significant difference ( $t=3.372$ ,  $df=419$ ,  $p=0.008$ ) between knowledge of malaria and preventive practices while a one way Anova test showed there was no significant difference ( $P>0.075$ ) between educational status and preventive practices.

**Keywords:** Malaria, perceptions, practices, Benue, North Central, Nigeria

### 1. Introduction

Malaria is a major public health challenge presently enjoying global attention and priority. Sub-Saharan Africa continues to carry a disproportionately high share of the global malaria burden. In 2015, the region was home to 88% of malaria cases and 90% of malaria deaths<sup>[1]</sup>. The Democratic Republic of the Congo and Nigeria together account for more than 35% of the global total of estimated malaria deaths.<sup>[1]</sup> The current thrust of malaria vector control in Nigeria is in the use of insecticide-based interventions both at personal and community levels. In the face of the National Malaria Elimination Program (NMEP) the potential contribution of findings from Malaria related Knowledge, Attitudes, and Practices (MKAP) cannot be undermined. The success of malaria control in any community cannot be effective if the said community's knowledge and application of control instruments are not rightly defined. Iwueze and co-authors<sup>[2]</sup> in 2013 reported that in spite of governmental efforts in controlling malaria burden through chemotherapy and Roll Back Malaria (RBM) initiatives, malaria continues to be on the increase due to poor community perception relating to causation, transmission, prevention and treatment. Ahorlu and others<sup>[3]</sup> opined that an understanding of a community's belief and behaviour is crucial to the success and easy application of specific control measures. In Tanzania and Ethiopia lack of MKAP contribute to increasing exposure to and spread of malaria, as well as renders ineffective control strategies<sup>[4, 5]</sup>. Several MKAP studies<sup>[6, 7, 8]</sup> in Nigeria have brought to the fore salient information that can aid local malaria control interventions and advance the national elimination vision. The web of some of the intricacies surrounding the success of this advanced scourge and its attendant challenges are exposed through information elicited from the survey questionnaires and mini informal face to face interviews and interactions.

### 2. Materials and Methods

#### 2.1 Study Area

Fourteen communities in both Gboko and Otukpo local government areas of Benue State, north central Nigeria were selected for the study. Eight of the study communities were rural and the inhabitant subsistence farmers while six were classified urban and semi-urban where

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the inhabitants engage more in secondary economic activities. Benue State is named after the Benue River and lies within longitude 7° 47' and 10° 0' East and Latitude 6° 25' and 8° 8' north. Based on Koppen climate classification, Benue State lies within the AW (tropical wet & dry) climate and experiences two distinct seasons, the Wet season and the Dry season. The Wet-rainy season lasts from April to October with annual rainfall in the range of 100-200mm. The dry season begins in November and ends in March. Temperatures fluctuate between 21 – 37 degrees Celsius in the year. Benue occupies a landmass of 34,059 square kilometers with a population of about 4,253,641 in 2006 census [9].

**2.2 Study Instrument-Survey Questionnaire**

A cross sectional investigation in the study communities on malaria related knowledge and practices using a semi structured (both open and closed ended questions) questionnaire. The survey questionnaire had three sections, the first section (A) sort to elicit information on the background of the respondents, section B was on knowledge of the cause, signs and symptoms of malaria. Then section C was on the home management of malaria and the utilization of Arteminisin-based Combination Therapy (ACT) and Long Lasting Insecticide treated Nets (LLINS).

**2.3 Ethical Consideration**

Prior to the commencement of the field work the study proposal was adequately reviewed (IRB/15/289); consequent upon this, state ethical approval was given by the Institutional Review Board (IRB) of the Nigerian Institute of Medical Research (NIMR); Yaba, Lagos. The protocol and safety guidelines met the conditions of NIMR-IRB policies regarding experiments that use human subjects.

In the same vein verbal informed consent of household, participants, or community heads and of all participants including minors and their guardians were all gotten and we worked with only those who gave their consent at each point in time. Participants were all selected randomly.

**2.4 Statistical Analysis**

Data from the investigations were sorted into related groups and subjected to statistical analysis using Excel spread sheet, Statistical Package for Social Sciences (SPSS ver. 23). Chi-square, t- test and Anova test tools were used where appropriate alongside simple percentages and bar charts.

**3. Results**

**3.1 Socio-Demographic Characteristics of Persons in the Selected Study Communities**

Distribution of the study participants is as shown in table 1. Marital status indicated that 69.8% were married while 21.0% unmarried. Others were grouped as divorced (2.1%), separated (1.7%) and the widowed accounted for 5.5%. Respondents age distribution ranged from 15-24 (20.0%); 25-34 (28.1%); 35-44 (26.0) 45-54 (14.5%) while 55 and above accounted for 11.4%. Several religious affiliations were encountered amongst which are Christianity (91.4%) the highest group; Islam (4.5%) Traditional (3.1%) and the no religion group accounted for only 1% as the least group. Our dataset showed 50% attained secondary level education, 18.1% had post-secondary education, 17.9% had primary level education and the group

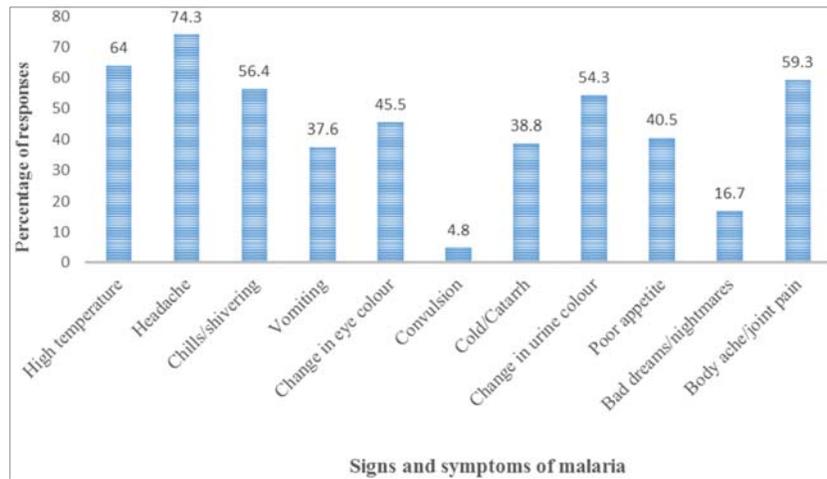
with 14.0% had no formal education at all. Respondent's occupation varied from farming with the highest percentage of 41.1%, housewife (11.2%); trading (11.0%); civil servants (10.2%); Students (9.8%) artisans (7.1%); unemployed (4.8%) and bankers accounted for the least group with 4.0%.

**Table 1:** Socio-Demographic Characteristics of Persons in the Selected Study Communities of Gboko and Otukpo Local Government Areas of Benue State, North Central Nigeria in 2015.

Characteristics	N	%
<b>Marital status</b>		
Un married	88	21.0
Married	293	69.8
Divorced	9	2.1
Separated	7	1.7
Widowed	23	5.5
<b>Age groups in years</b>		
15-24	84	20.0
25-34	118	28.1
35-44	109	26.0
45-54	61	14.5
55+	48	11.4
<b>Religion</b>		
Christianity	384	91.4
Islam	19	4.5
Traditional	13	3.1
No religion	4	1.0
<b>Level of education</b>		
No formal education	59	14.0
Primary	75	17.9
Secondary	210	50.0
Post-secondary	76	18.1
<b>Occupation</b>		
Unemployed	20	4.8
Housewife	47	11.2
Farming	176	41.9
Artisan	30	7.1
Formally employed in public sector (e.g. Civil servant)	43	10.2
Formally employed in private sector (e.g. banker)	17	4.0
Trading	46	11.0
Student	41	9.8

**3.2 Respondents Knowledge about Signs and Symptoms of Malaria in the Selected Study Communities**

Results of our investigation (Fig.1) shows that headache (74.3%) and high temperature (64%) are the major sign and symptom of malaria. Other signs and symptoms recorded in descending percentage order are body ache/joint pains (59.3%); chills/shivering (56.4%);change in urine colour (54.3%); change in eye colour (45.5%); poor appetite (40.5%); cold/catarrh (38.8%); vomiting (37.6%); bad dreams/nightmares (16.7%) and the least is convulsion with 4.8%.

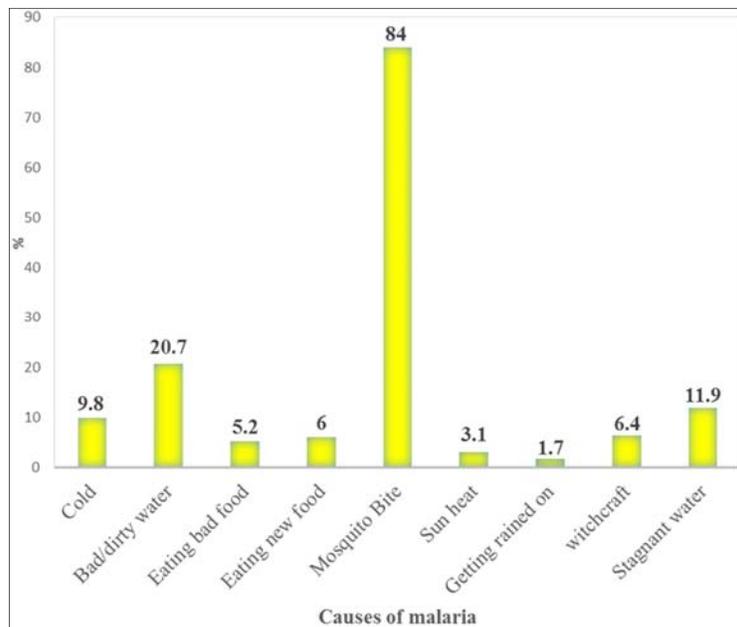


**Fig 1:** Respondents Knowledge about Signs and Symptoms of Malaria in the Selected Study Communities of Gboko and Otukpo Local Government Areas of Benue State, North Central Nigeria in 2015

**3.3 Respondents Knowledge about Causes of Malaria in the Selected Study Communities**

Our data (Fig.2) indicates that 84% of the respondents attributed the cause of malaria to mosquito bites, 20.7% attributed the cause of malaria to bad or dirty water. Several

other causes of malaria given by the respondents are: stagnant water (11.9%); cold (9.8%); witchcraft (6.4); eating new food (6.0%); eating bad food (5.2%); heat from the sun (sun heat) (3.1%) and the least is getting rained on which accounts for 1.7%.

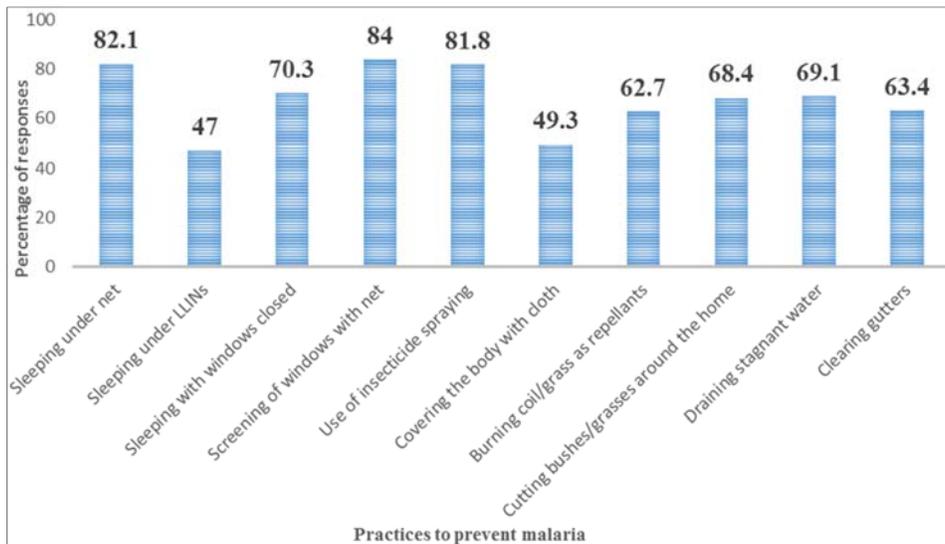


**Fig 2:** Respondents Knowledge about Causes of Malaria in the Selected Study Communities of Gboko and Otukpo Local Government Areas of Benue State, North Central Nigeria in 2015.

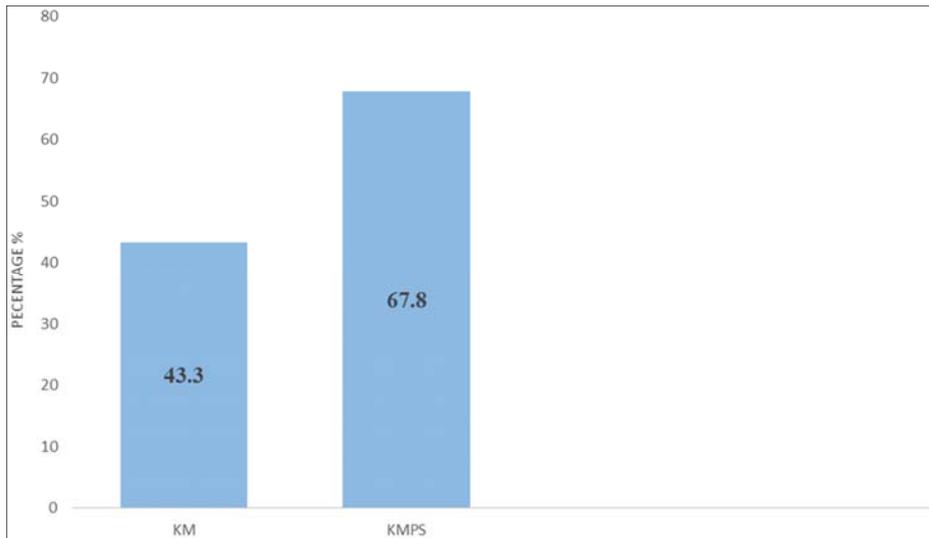
**3.4 Respondents Knowledge about Malaria Preventive Practices in the Selected Study Communities**

A myriad of practices (Fig. 3) were expressed by the respondents, 84% were of the opinion that screening of windows with net helps to prevent malaria while 82.1% was recorded for sleeping under nets. Other measures engaged to prevent malaria were use of insecticide sprays (81.1%); sleeping with windows closed (70.3%); draining stagnant water (69.1%);cutting bushes/grasses around the home(68.4%); cleaning gutter (63.4%); burning coils/grass as

repellants (62.7%) and covering of cloth accounted for 49.3%. Interestingly sleeping under long lasting insecticide treated nets (LLINs) accounted for the least with 47%. There was a significant difference ( $t=3.372, df=419, p=0.008, Fig.4$ ) between knowledge of malaria and preventive practices while a one way Anova test ( $P>0.075$ , Table 2,) showed there was no significant difference between educational status and preventive practices.



**Fig 3:** Respondents Knowledge about Malaria Preventive Practices in the Selected Study Communities of Gboko and Otukpo Local Government Areas of Benue State, North Central Nigeria in 2015.



**Key:** KM-Knowledge of Malaria, KMPS-Knowledge of Malaria Preventive Strategies

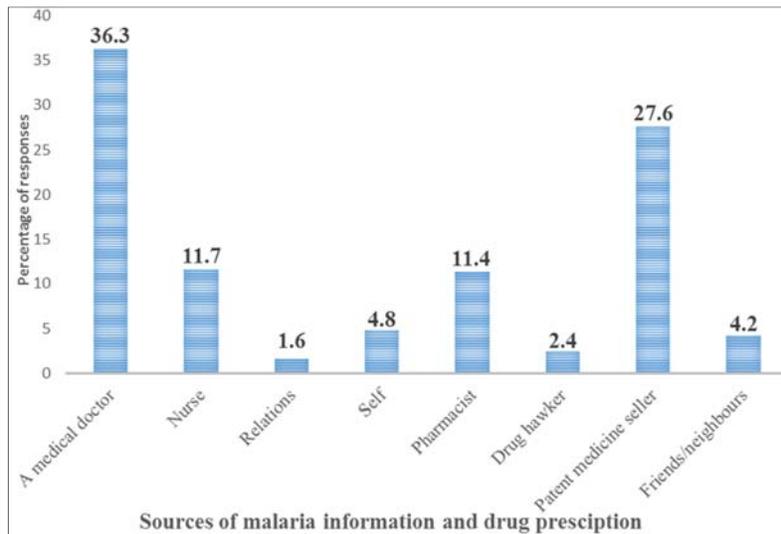
**Fig 4:** Relationship between knowledge of malaria and knowledge of the preventive strategies among the respondents in the selected communities of Gboko and Otukpo Local Government Areas of Benue State in 2015.

**Table 2:** Negative association between Educational Status and knowledge of the preventive strategies among the respondents in the selected communities of Gboko and Otukpo Local Government Areas of Benue State in 2015 ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.649	1	2.649	3.190	0.075
Within Groups	232.475	280	0.830		
Total	235.124	281			

**3.5 Respondents Source of Malaria Information and Treatment Seeking Behaviour.**

Malaria information and drug prescription were gotten from various sources by respondents. Top on the list are medical doctors (34.3%) followed closely by Patent medicine sellers (27.6%). Within the same range were the nurses (11.7%) and Pharmacist (11.4%). Self-medication (4.8%) was also found in the same range as friends and neighbours (4.2%). Drug hawkers accounted for (2.4%) while the least (1.6%) was recorded for relations. A mix of traditional and orthodox medication was observed among a few respondents while others boil herbs and Panadol as a drink to treat malaria.



**Fig 5:** Respondents Source of Malaria Information and Drug Prescription in the Selected Study Communities of Gboko and Otukpo Local Government Areas of Benue State, North Central Nigeria in 2015

#### 4. Discussion

A substantial number of the respondents (84%) were able to make an accurate association between malaria and mosquito bite which is similar to findings by Hlongwana and co-authors. [10] Results of the knowledge about signs and symptoms of malaria listed headache (74.3%) and high temperature (64%) amongst other symptoms which are in agreement with other available literature [11,12,13]. Our observations regarding preventive practices showed screening of windows with net (84%) sleeping under nets (82.1%) and spraying with insecticides (81.8%) were key preventive measure among others. This is similar to Amaechi and Ukpai, [14] Eugene and Ejike Ezebilo [15] who also reported multiple preventive strategies amongst which are use of insecticide sprays, repellents and mosquito coils. A few of the respondents burn herbs every night while one respondent smokes herbs every night before going to bed just to prevent malaria.

Various reasons were given for the low use of LLINs (47%) among which are no purchasing power, political exclusion, and the wrong assumption that the chemical used to treat the net is lethal. It is interesting to note that Omudu and co-authors [16] reported that the proportion of untreated nets (69.5%) deployed by households in the state capital Makurdi, more than doubled that of ITNS (30.5%). There is an emerging challenge with net usage that needs urgent attention as it is one of the major intervention tool driving the national elimination goal. It was encouraging to find that knowledge of malaria preventive practices had a significant impact on malaria preventive measures while the level of education on the other hand had no influence on malaria preventive practices. In fact two respondent with secondary level education in the urban communities Government Reserved Area (GRA) were the respondents who vowed never to use the LLINs because it is lethal. Advocacy on enhanced net's quality, integrity and usage should be carried out as this will reduce vector-human contact hence malaria transmission. In an endemic urban area of Ecuador and Peru health education was the main reason for an increase in knowledge of vector and use of bed nets which led to the decrease in malaria transmission [17]. In the same

vein the health education curriculum of schools should be inclusive of malaria knowledge in terms of causation and preventive measures. The main channels through which respondents in the survey gathered information on malaria alongside treatment seeking behaviour were similar to other findings as well [18, 19]. However, the culture of combining traditional and orthodox medication that was observed among a few respondents needs further investigation. Another dangerous trend that needs to be addressed as a matter of urgency is the prescription referred to as 'MIX' (a combination of several unknown drugs) given to suspected malaria patients by the patent medicine sellers.

#### 5. Recommendations

1. There is need for improving and updating malaria knowledge notwithstanding their fair knowledge especially through the preferred channels. Radio jingles in vernacular on malaria and promotional programmes should be employed in the enlightenment programmes. Introducing pictorial inserts that illiterate villagers, can use as visual aids should be considered in such campaign.
2. LLINs distribution should be expanded to cover unreached people groups. Its integrity as an improved control tool and emphasis on accurate steps in its usage clearly spelt out for the recipients to boost their confidence in its efficacy as a control tool. Net replacement exercise should be carried out a bit more frequently to replace worn out ones.
3. The emerging net usage challenge calls for further research into the adverse reactions such as burning skin sensations, peppery feelings in the eyes, and unproven death especially of new born babies.
4. Pictorial insert that will enhance illiterate villager's understanding of age or weight in drug dispensing is vital in preventing drug abuse.

#### 6. Conclusion

The information elicited from the survey questionnaires has the capacity to unearth the web of intricacies surrounding this

advanced and ancient disease. Salient points that can aid malaria control and help to sustain the drive towards malaria elimination are also brought to the front burner.

### 7. Competing interests

We declare that there is no conflict of interest with respect to this study.

### 8. References

- World Malaria Report. WHO 2015  
[http://www.who.int/malaria/publications/world\\_malaria\\_report/en/](http://www.who.int/malaria/publications/world_malaria_report/en/)
- Iwueze MO, Ezugbo-Nwobi IK, Umeanaeto PU, Egbuche CM, Anaso CI. Knowledge, attitude and management practices on malaria: A case study of Amansea, Awka North Local Government Area of Anambra State, Nigeria. *The Bioscientist*. 2013; 1(1):32-38.
- Ahorlu CK, Dunyo SK, Afari EA, Koram KA, Nkrumah FK. Malaria-related beliefs and behaviour in Southern Ghana: Implications for treatment, prevention and control. *Tropical Medicine & International Health*. 1997; 2(5):488-499.
- Mboera LE, Shayo EH, Senkoro KP, Rumisha SF, Mlozi MR, Mayala BK. Knowledge, perceptions and practices of farming communities on linkages between malaria and agriculture in Mvomero District, Tanzania. *Acta tropica*. 2010; 113(2):139-144.
- Legesse M, Deressa W. Community awareness about malaria, its treatment and mosquito vector in rural highlands of central Ethiopia. *Ethiopian Journal of Health Development*, 2009, 23(1).
- Nebe OJ, Adeoye GO, Agomo PU, and Mosanya ME. Malaria in a coastal area of Lagos state Nigeria: A survey of perceptions and practices amongst mothers/care-givers of children under five years old. *Nigerian Journal of Parasitology*. 2002; 23(1):69-80.
- Erhun WO, Agbani EO, Adesanya SO. Malaria prevention: Knowledge, attitude and practice in a southwestern Nigerian community. *African Journal of Biomedical Research*. 2005; 8(1):25-29.
- Okeke TA, Uzochukwu BS, and Okafor HU. An in-depth study of patent medicine sellers' perspectives on malaria in a rural Nigerian community. *Malaria journal*. 2006; 5(1):97.
- Frong Federal Republic of Nigeria. Official Gazette-Census. Frong. 2006; 2(96): Abuja 2<sup>nd</sup> 2009.
- Hlongwana KW, Mabaso ML, Kunene S, Govender D, Maharaj R. Community knowledge, attitudes and practices (KAP) on malaria in Swaziland: A country earmarked for malaria elimination. *Malaria Journal*. 2009; 8:29. <http://doi.org/10.1186/1475-2875-8-29>
- Singh R, Musa J, Singh S, Ebere UV. Knowledge, attitude and practices on malaria among the rural communities in aliero, northern Nigeria. *Journal of family medicine and primary care*. 2014; 3(1):39.
- Abate A, Degarege A, Erko B. Community knowledge, attitude and practice about malaria in a low endemic setting of Shewa Robit Town, northeastern Ethiopia. *BMC Public Health*. 2013; 13(1):1.
- Forero DA, Chaparro PE, Vallejo AF, Benavides Y, Gutiérrez JB, Arévalo-Herrera M *et al*. Knowledge, attitudes and practices of malaria in Colombia. *Malaria journal*. 2014; 13(1):1.
- Amaechi EC, Ukpai OM. Knowledge, attitude and practices about malaria among mothers and care-givers in Aba South Local Government Area, Abia state, Nigeria. *Animal Research International*. 2013; 10(3):1786.
- Eugene-Ezebilo DN, Ezebilo EE. Home-based malaria management in children by women: Evidence from a malaria endemic community in sub-Saharan Africa. *Asian Pacific Journal of Tropical Disease*. 2015; 5(7):532-538.
- Omudu EA, Omobhund ME. Studies on Bed-Net Ownership and Utilization and other Mosquito Control Practices in Makurdi, Nigeria, 2015.
- Nieto T, Méndez F, Carrasquilla G. Knowledge, beliefs and practices relevant for malaria control in an endemic urban area of the Colombian Pacific. *Social science & medicine*. 1999; 49(5):601-609.
- Obembe A, Oduola A, Popoola K, Ajao A. Community knowledge and practices as regards malaria in Ilorin City: implications for the elimination plan of the National Malaria Elimination Program. *Asian Pacific Journal of Tropical Disease*, 2014; 4:S583-S589.
- Shayo EH, Rumisha SF, Mlozi MR, Bwana VM, Mayala BK, Malima RC *et al*. Social determinants of malaria and health care seeking patterns among rice farming and pastoral communities in Kilosa District in central Tanzania. *Acta tropica*. 2015; 144:41-49.