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Knowledge and utilization of malaria preventive measures among people in a selected community settlement of north central Nigeria

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Abstract
Background: Malaria is the notorious impediment of public health and economic development accounting for 367 000-755 000 deaths globally. This study was aimed at determining the level of knowledge and utilization of preventive measures for malaria in among people in Panda Community, Karu Local Government Area, Nasarawa State, Nigeria.
Materials and Methods: A cross sectional survey was adopted for this study. Close-ended pre-tested structured questionnaires were administered to consenting individuals within Panda community, using the convenience sampling technique. A total number of 450 questionnaires were administered between May to August 2016; 420 were filled and returned; giving a response rate of 93.3%. Data analysis was done using SPSS, version 22. Data were presented in frequency tables; and analysed using descriptive and inferential statistics. The hypothesis was tested using chi-square technique; at 0.05 level of significance.
Results: The mean age of respondents was 28.8 years. The knowledge on causes and predisposing factors to malaria was significantly high, (93.3%) while the knowledge on malaria preventive measures was moderate (55%) Further findings revealed that, there was no significant association between knowledge of malaria and the utilization of its preventive measures (X^2=0.4511, CV=3.84 P=0.625, SL=0.05). However, a statistically significant relationship was found between the level of education and utilization of malaria preventive measures (X^2=8.7855, CV=7.81 P=0.03, SL=0.05).
Conclusion: There is adequate knowledge about malaria and its preventive measures, but the utilization of these measures is not commensurate to the level of knowledge. There is need for concerted efforts toward addressing the barriers to utilization of these effective interventions.

Keywords: knowledge, utilization, malaria

Introduction

The prevalence of malaria cuts across the tropics and other regions of the world. Globally, an estimated 3.3 billion people are at risk of being infected with malaria and developing the disease; and 1.2 billion people are at high risk (>1 in 1000 chances of getting infected with malaria in a year) [1]. According to the latest estimates, 198 million cases of malaria occurred globally in 2013 (uncertainty range 124–283 million) and the disease led to 584 000 deaths (uncertainty range 367 000–755 000). The burden is heaviest in the Sub-Saharan Africa, where an estimated 90% of malaria-related deaths occur; and children below the age of 5 years, account for 78% of the deaths [2].

Malaria exacts a heavy burden on the poorest and most vulnerable communities. It primarily affects low and lower-middle income countries. In the endemic countries, the poorest and most marginalized communities are the most severely affected; having the highest risks associated with malaria, and the least access to effective services for prevention/control, diagnosis, treatment, and ultimately its elimination is inextricably linked with health system strengthening, infrastructure development and poverty reduction [3].

Sub-Saharan African Countries account for 90% of global malaria deaths and these includes; Nigeria, Democratic Republic of Congo (DRC), Ethiopia, and Uganda [4]. Malaria is the 2nd leading cause of death from infectious diseases in Africa, after HIV/AIDS. Almost 1 out of 5 deaths of children below 5 years in Africa is due to malaria [5].

Malaria is a major public health problem in Nigeria; where it accounts for more cases and deaths than any other country in the world [6]. Malaria is a risk for 97% of Nigeria's population. The remaining 3% of the population live in the malaria free highlands. In Nigeria, there are 100 million estimated cases of malaria, with over 300,000 deaths per year, compared to 215,000 AIDS-related deaths per year. Malaria contributes to an estimated 11% of maternal mortality [6, 7].

Malaria accounts for 60% of outpatient visits and 30% of hospitalizations, among children under five years of age in Nigeria. Malaria has the greatest prevalence - close to 50% in children age 6 to 59 months in the South West, North Central, and North West regions; while it has the least prevalence - 27.6% in children age 6 to 59 months in the South East region [8].

A previous systematic review has shown that insecticide treated nets are beneficial to all people, most especially pregnant women and nursing mothers in Sub-Saharan Africa

[9]. Indeed, it is one of the main strategies of the Roll Back Malaria (RBM) partnership.

A prospective cross-sectional survey was conducted on knowledge and utilization of malaria control measures among pregnant women at a tertiary hospital in Nigeria's federal capital territory. Close-ended pre-tested questionnaires were administered by interview method to 403 consecutive consenting women. Results showed that, knowledge of malaria and its preventive measures in pregnancy was 71.5%. The utilization of insecticide treated net (ITN) was 42.6%; while 15.9% of respondents received the intermittent preventive treatment. Furthermore, the study found that there was a significant association between knowledge of malaria and the education status. ($X^2 = 16.053$, $P = 0.035$). The study concluded that, there is adequate knowledge about malaria and its preventive measures, but the utilization of these measures is poor [10].

Another study was conducted on knowledge and utilization of malaria control measures by pregnant women and newly delivered mothers in Ibadan, Nigeria. 1330 pregnant and newly delivered women in 132 facilities within the Ibadan metropolis were surveyed. The modes of prevention commonly reported as effective were: the use of insecticide spray, window nets and ITNs. The study demonstrated awareness but poor use of control measures [11].

In spite of the available preventive measures and treatment modalities, there still exist continuous malaria attacks across different age groups within the rural communities [12].

Against this backdrop, the study aimed to determine the level of knowledge and utilization of malaria preventive measures among individuals in Panda, Karu LGA of Nasarawa State, Nigeria.

Materials and Methods

Study design

The study was a non-experimental, descriptive survey, in which quantitative data were collected to determine the level of knowledge and utilization of malaria preventive measures among people in Panda community, Karu Local Government Area, Nasarawa State, Nigeria.

Study location

The study was conducted in Panda community of Karu Local Government Area, Nasarawa State Panda is located in the Northern part of Nigeria; about seven hundred kilometers away from Abuja, the Federal Capital Territory of Nigeria. The community is made up of various ethnic groups basically; Yeskwa, Koro, Mada, Gbagyi among others. The major occupation of the inhabitants of Panda is farming; a few engage themselves in various kinds of petty trading. The vegetation is a mixture of rainforest and Savannah types; while rainfall is seasonal and occurs between the months of March and October. There are no good roads, no pipe-borne water supply nor electricity in the area. Malaria is holo-endemic in the area [7]. It has four primary schools (two private and two Government primary schools) and three secondary schools (two private and one Government secondary school). There is a private clinic (Aminchi Clinic), a maternity (Salama Maternity), primary health centre and a General Hospital, which serve the community.

Study population

The study population comprised of all the inhabitants of Panda community who were randomly selected using convenience sampling technique within three Months (May-August 2016).

Data collection method

A closed ended pre-tested structured questionnaire of 34 items, which comprised of Sections A, B, C and D was formulated and administered to consenting individuals. The sections focused on: socio-demographic characteristics, knowledge of respondents about the causes and factors predisposing to malaria infection, knowledge about the available preventive measures and utilization of the preventive measures, respectively. A total number of 450 questionnaires were administered, 420 were filled and returned giving a response rate of 93.3%.

Data analysis

Statistical analysis was done using SPSS, version 22. Data were presented in frequency tables; and analysed using descriptive and inferential statistics. The hypothesis was tested using chi-square technique; at 0.05 level of significance.

Ethical Consideration

Approval to conduct this study was obtained from the community Chief of Panda. Participants were recruited into the study after obtaining informed consent from each of them.

Results

Table 1: Socio-demographic characteristics of respondents n = 420

	Number	Percentage (%)	Mean
Age Range (Years)			**28.82 (SD 4.74)**
16-20	140	33.3	
21-25	91	21.7	
26-30	49	11.7	
31-35	35	8.3	
35>	105	25.0	
Total Educational level	**420**	**100**	
None	21	5.0	
Primary	21	5.0	
Secondary	182	43.3	
Tertiary	196	46.7	
Total Occupation	**420**	**100.0**	
Farming	28	6.7	
Student	210	50.0	
Business	56	13.3	
Civil Servant	126	30.0	
Total Ethnic Group	**420**	**100.0**	
Yeskwa	252	60.0	
Koro	28	6.7	
Others	140	33.3	
Total	420	100.0	

The mean age of the participants was 28.82 years (SD 4.74). A total of 196 respondents (46.7%) had completed tertiary education, 182 (43.3%) had secondary education, 21 (5.0%) had primary education, while 21 (5.0%) respondents did not have any form of education. A total of 210 (50.0%) respondent were students, 126 (30.0%) were civil servants, 56 (13.3%) engaged in various forms of businesses and 28 (6.7%) were farmers by occupation. With respect to ethnicity, 252 (60.0%) of the respondents were Yeskwa, 140 (33.3%) belongs to other ethnic group while 28 (6.7%) were Koro by tribe.

Table 2: Knowledge on causes of Malaria n = 420

Causes	Number of respondents	Percentage (%)
Mosquitoes' Bite		
Yes	392	93.3
No	20	4.8
Don't Know	8	1.9
Total Having Sex with infected persons	**420**	**100**
Yes	14	3.3
No	406	96.7
Don't Know	0	0
Total Witchcraft	**420**	**100**
Yes	70	16.7
No	345	82.1
Don't Know	5	1.2
Total	**420**	**100**

A total of 392 (93.3%) respondents correctly attributed the cause of malaria to mosquito bites while 2 (3.33%) respondents wrongly noted the cause of malaria to be from having sex with somebody that has malaria fever. Erroneous belief such as witchcraft, responsible for malaria infection was reported to be 70 (16.7%) of the respondents.

Table 3: Respondents Knowledge on malaria preventive measures n=420

Preventive measures	Number of Respondents	Percentage (%)
Use of ITN		
Yes	350	8
No	67	16.0
Don't know	3	0.7
Total Use of Drugs	**420**	**1**
Yes	336	80.0
No	0	0
Don't Know	84	20.0
Total Keeping environment tidy	**420**	**100**
Yes	385	91.7
No	3	0.7
Don't Know	32	7.6
Total	**420**	**100**

Table 3 above reveals that keeping the environment tidy was the most common malaria preventive measure known to the respondents (91.7%). A total of 350 respondents (83.3%) agreed to the use of Insecticide treated nets as preventive measures, while 336 (80.0%) acknowledged the use of drugs as a malaria preventive measure.

A total of 308 (73.3%) out of 420 respondents in this study sleep under Insecticides Treated Mosquito Nets, 259 (61.7%) use drugs as preventive measure for malaria and 252 (60.0%) have window/door nets in their houses to prevent them from mosquito bites.

Table 4: Status of Knowledge about causes and predisposing factors to Malaria Fever n = 420

Rating	Number	Percentage
Excellent	392	93.3
Good	14	3.3
Average	0	0.0
Fair	0	0.0
Poor	14	3.3
Total	**420**	**100.0**

The summary of the status of knowledge on malaria is shown in Table 2. Total 392 of respondents (93.3%) had excellent knowledge of the cause and predisposing factors to malaria, 14(3.3%) had good knowledge; while 14(3.3%) had poor knowledge. None of the respondents (0.0%) had average or fair knowledge on causes and predisposing factors to malaria.

Table 5: Status of Knowledge on available preventive measures for Malaria Fever n = 420

Rating	Number	Percentage
Excellent	231	55.0
Good	70	16.7
Average	49	11.7
Fair	21	5.0
Poor	49	11.7
Total	**420**	**100.0**

The summary of the status of knowledge on available preventive measures is shown in Table 3. 231 respondents (55%) had excellent knowledge on available preventive measures for malaria, 70 (16.7%) had good knowledge, 49 (11.7%) had average knowledge, 21 (5%) had fair knowledge and 21 (11.7%) had poor knowledge about the available preventive measures for malaria.

Table 6: Status of level of utilization of preventive measures for Malaria Fever n = 420

Rating	Number	Percentage
Excellent	91	21.7
Good	126	30.0
Average	84	20.0
Fair	63	15.0
Poor	56	13.3
Total	**420**	**100.0**

The summary of the status of level of utilization of preventive measures for malaria fever is shown in Table 4. 91 respondents (21.7%) excellently utilize the available preventive measures for malaria; 126 (30.0%) were rated good in utilization of available preventive measure; 84 (20.0%) averagely utilized available preventive measures for malaria; 63 (15.0%) fairly utilized available malaria preventive measures; while 56 (13.3%) poorly utilized available preventive measures for malaria.

Table 7: Cross tabulation between Knowledge of malaria and the utilization of preventive measures for malaria.

	Utilization of Malaria Preventive Measures		
Knowledge of Malaria	**Yes**	**No**	**Total**
Yes	360	18	378
No	39	3	42
Total	399	21	**420**

Chi-square (X^2)=0.4511, Critical value (CV)=3.84, P=0.625, Significant Level (SL)=0.05.

There was no statistically significant association between knowledge of malaria and the utilization of malaria preventive measures (X^2=0.4511, CV=3.84 P=0.625, SL=0.05).

Table 8: Cross tabulation between educational status and the utilization of preventive measures for malaria.

	Utilization of Malaria Preventive Measures		
Educational Status	**Yes**	**No**	**Total**
None	19	2	21
Primary	18	3	21
Secondary	129	53	182
Tertiary	128	68	196
Total	294	126	**420**

Chi-square (X^2)=8.7855, Critical value (CV)=7.81, P=0.03, Significant Level (SL)=0.05.

Table 9: Respondents Utilization of Malaria Preventive measures n=420

Preventive Measures	Number of Respondents	Percentage (%)
Use of Mosquitoes' Nets		
Yes	308	73.3
No	112	26.7
Total Use of Prophylactic drugs	**420**	**100**
Yes	259	61.7
No	161	38.3
Total Use of Window/Door Nets	**420**	**100**
Yes	252	60.0
No	168	40.0
Total	**420**	**100**

There was a statistically significant association between utilization of malaria preventive measures and educational level (X^2=8.7855, CV=7.81 P=0.03, SL=0.05).

Discussion

More than a decade ago, the heads of states from across Africa signed a declaration in Abuja, Nigeria, to halve the malaria mortality for Africa by 2010 [13]. The knowledge and use of malaria preventive measures within the community are very important factors, which are pivotal to the realization of the targets of the Roll Back Malaria program.

The mean age of 28.8 years found among the participants is similar to findings in other studies [14-16].

Most of the participants in this study were literate with 90.0% of them having had secondary or tertiary education (43.3% and 46.7%, respectively). This is similar to the findings in a study in Benin, Nigeria [16]. However, the literacy level of the participants in this study was much higher than the findings from the 2008 Nigeria Demographic Health Survey where only 45% of the participants attended secondary and tertiary institutions [17].

The high literacy level seen in this study may be related to the proximity of the location of the study area to Nigeria's federal capital territory with high population of civil servants and educated people. The high literacy rate had a significant correlation with the knowledge of malaria and its prevention measures.

The knowledge of the cause of malaria was excellent as 93.3% of the respondents correctly attributed it to mosquito bites. This is similar to the findings of 89% in a study in the mid- western part of Nigeria [18]. This finding is also consistent with findings in community surveys in south-western Nigeria and northern Ethiopia [19, 20]. This excellent knowledge of the cause of malaria among the participants confirmed malaria as a common infection in Nigeria. Despite this good knowledge about the cause, some participants still had some erroneous convictions that malaria could be caused by witchcraft (16.7%) and having sex with someone that has malaria fever (3.3%). These wrong beliefs no doubt will have negative implications on malaria control programs as energy and resources would be channelled wrongly toward control and prevention of malaria by these individuals. They may also be unwilling to embrace malaria preventive practices.

About 96% of the study population knew that malaria was a preventable disease and Insecticides Treated Net was the most common preventive measure known. This is high compared with findings in another study in northern Nigeria of 36% [21]. The difference in knowledge is likely due to the high level of knowledge about malaria in Panda community due to its prevalence compared to Kano state.

The overall status of knowledge of malaria and its preventive measures in this study was high. This is similar to the findings at an antenatal clinic in Kenya where 86.9% had adequate knowledge [22].

There was no significant association between knowledge of malaria and the utilization of its preventive measures (X^2=0.4511, CV=3.84 P=0.625, SL=0.05). This implies that, although most of the respondents had adequate knowledge on malaria; their knowledge was less utilized in the prevention of malaria fever. However, a statistically significant relationship was found between the level of education and utilization of malaria preventive measures (X^2=8.7855, CV=7.81 P=0.03, SL=0.05). This finding is similar to findings in Kenya and south eastern Nigeria [22, 23].

In addition, about 93.3% of the respondents exhibited an excellent knowledge on malaria fever while only 21.7% excellently utilize the available preventive measures for malaria fever. This disparity can be attributed to the low socio-economic status of majority of the respondents; and their poor attitude with respect to health seeking behaviours.

Ownership of insecticide-treated bed nets by 73.3% of respondents was encouraging and far better than results from the recent Nigeria Demographic Health Survey, which showed a household ownership of 8% and 7% nationally and in the north central zone, respectively [17].

Conclusion

The study has clearly demonstrated that there is a high level of knowledge about malaria fever and its preventive measure, but the level of utilization of available preventive measure is low compared to the level of knowledge.

Recommendations

In view of the findings from this survey, the researcher hereby recommends that:

- ✓ More efforts should be geared towards ensuring that people utilize available preventive measures for malaria within their reach.
- ✓ Health care providers and environmental officers should place more emphasis on preventive rather than curative measures for malaria fever.
- ✓ Government at all levels, including non-governmental organizations that provide preventive measures, such as: Insecticide Treated Nets should also follow-up to ensure the effective utilization of the nets by recipients.

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