Behavioral practices preventing malaria disease infection/transmission among adult in Sokoto metropolis.

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Abstract

Malaria disease a public health concern which WHO estimates that more than 90% of the 1.5 to 2.0 million deaths due to malaria disease worldwide. These necessitated the research in the behavioral practices that prevent malaria disease infection/transmission, since disease prevention is cost effective than treatment. Data collected were analyzed using descriptive statistic of frequency count, normative percentage and grand mean; as well as inferential statistics of chi-square ($\chi 2$). The level of significant was fixed at 0.05. Appropriate degrees of freedom were worked out. A cross-sectional form of descriptive survey research design was used for this study. This is because descriptive studies are used when the characteristics of a population are either unknown or partially known, this justified the use of similar design in a study of similar nature. Two hundred and seventy (270) copies (90%) of structured interview distributed out of three hundred (300) copies were returned and used for data analysis. In the behavioral practices preventing malaria infection/transmission, among the statistical calculated chi-square ($\chi 2=13269$, is greater than the tabulated $\chi 2=32.671$ at df=21, $p<0.05$). Therefore, the null hypotheses were rejected, and conclusion drawn that there is a significant difference between male and female respondents in the behavioral practices preventing malaria infection/transmission. The male exhibited good behavioral practices preventing malaria infection/transmission than the female gender. Influence of age groups on the behavioral practices preventing malaria infection/transmission, showed a statistical significance of calculated chi-square ($\chi 2=12764.8$, is greater than the tabulated $\chi 2=61.63$ at df=49, $p<0.05$). Therefore, the null hypotheses were rejected, and conclusion drawn that there is a significant difference between the different age groups in the behavioral practices preventing malaria infection/transmission. Influence of educational level on the behavioral practices preventing malaria disease infection/transmission, showed statistical significance, the calculated chi-square ($\chi 2=12384$ is greater than the tabulated $\chi 2=61.63$ at df=49, $p<0.05$). Therefore, the null hypotheses were rejected, and conclusion drawn that there is a significant difference between the different educational level on the behavioral practices preventing malaria disease infection/transmission. There was influence age, gender and educational level on behavioral practices preventing malaria disease infection/transmission. The behavioral practices preventing malaria disease infection/transmission among the subject was not generally good across the ages, gender and educational level hence the control of malaria disease is impeded.

Keywords: Behavioral practices, Malaria prevention, Infection/Transmission.

Accepted on May 24, 2018

Introduction

Malaria remains an important public health concern in countries where transmission occurs regularly, as well as in areas where transmission has been largely controlled or eliminated [1,2]. Malaria is a complex disease that varies widely in epidemiology and clinical manifestation in different parts of the world. This variability is the result of factors such as the species of malaria parasites that occur in a given area, their susceptibility to commonly used or available antimalarial drugs, the distribution and efficiency of mosquito vectors, climate and other environmental conditions and the behaviour and level of acquired immunity of the exposed human populations [2]. In Africa especially sub-Saharan Africa, malaria is ranked among the most frequent causes of morbidity and mortality among children and is often the leading identifiable cause. WHO estimates that more than 90% of the 1.5 to 2.0 million deaths. There is almost always a term that corresponds to clinical malaria. However, there is not always agreement among the patients' perceptions of malaria symptoms, the definition of malaria used in a local health clinic, and the definition used by parasitologists [3]. The result frequently is nosological fusion, a phenomenon in which there is a failure to distinguish between what are biomedically two or more discrete diseases [3]. Nosological fusion can affect, in three ways, whether a person feels that a control measure is efficacious. First, if an illness is incorrectly diagnosed as malaria, the patient may conclude that preventive measures taken, such as the use of impregnated bed nets, do not prevent malaria. Alternatively, the patient may conclude that an antimalarial medication is ineffective when in fact the drug is inappropriate for whatever disease is present. Finally, nosological fusion can make local treatments seem effective when they are not. For example, if a viral infection is diagnosed incorrectly as malaria and the patient takes a local remedy and becomes well, the patient may conclude that the treatment is efficacious against malaria when it is not; the viral infection has merely been resolved by the patient's own immune system [3]. Many malaria control strategies exist, but none are appropriate and affordable in all contexts. Malaria control and prevention efforts need to be designed for the specific environment in which they will be used and need to take into account the local epidemiology of malaria and the level of available resources and political will [2].

Statement of problem

WHO estimates that more than 90% of the 1.5 to 2.0 million deaths due to malaria disease worldwide [4]. Another study found that Plasmodium falciparum infection prevalence in endemic Africa halved and the incidence of clinical disease fell by 40% between 2000 and 2015. Report that interventions have averted 663 million clinical cases since 2000. Insecticide-treated nets, the most widespread intervention, were by far the largest contributor to the reduction in malaria related deaths [5]. Approximately 300-500 million cases of malaria occur every year, and 1-2 million deaths occur, most of them in young children.

Aims and Objectives

The main purpose of the study was to determine the behavioral practices on malaria disease preventive measures among adults in Sokoto metropolis. In specific terms, the objectives of the study include:

1. To ascertain the influence of gender on the behavioral practices on malaria disease preventive measures adopted by adults in Sokoto metropolis.
2. To determine the influence of age on the behavioral practices on malaria disease preventive measures adopted by adults in Sokoto metropolis.
3. To ascertain the influence of level of education on level of behavioral practices on malaria disease preventive measures adopted by adults in Sokoto metropolis.

Significance of the study

Results of the study would reveal the behavioral practices (risk factors) and preventive measures on malaria among adults in Sokoto metropolis. Specifically, result of the study would be significant to adults (male/female), Public health officers, health counselors, health educators, curriculum planners, medical allied personnel and researchers in assessing behavioral practices and preventive measures on malaria disease and initiating preventive measures programs succeed in adult populace in Sokoto metropolis. Although good behavior practices, assessment would motivate effectiveness of program in this locality. Results of the study would motivate public health workers toward identifying behavioral practices (risk factors) that are common in this locality. Health counselors would through the results of this study develops and adapts effective method on the best malaria preventive practices. Health educators, curriculum planners and researchers would be able to identify gaps in behavioral practices that can aid in the development of health education and health promotion concepts that can be utilized in the community to address the deficiencies.

Research Questions

The following research questions gave direction to the study:

1. What is level of influence of gender on the behavioral practices on malaria disease preventive measures adopted by adults in Sokoto metropolis?
2. What is the level of influence of age on the behavioral practices on malaria disease preventive measures adopted by adults in Sokoto metropolis?
3. What is the influence of level of education on level of behavioral practices on malaria disease preventive measures adopted by adults in Sokoto metropolis?

Hypotheses

The following null hypotheses were postulated for the study:

1. There is no significant difference between gender on the behavioral practices on malaria disease preventive measures adopted by adults in Sokoto metropolis.
2. There is no significant difference in the age on the behavioral practices on malaria disease preventive measures adopted by adults in Sokoto metropolis.
3. There is no significant difference on level education

on behavioral practices on malaria disease preventive measures adopted by adults in Sokoto metropolis.

Research design

A cross-sectional form of descriptive survey research design was used for this study. This is because descriptive studies are used when the characteristics of a population are either unknown or partially known [1], this justified the use of similar design in a study of similar nature.

Study area and the population

1 Brigade medical centre, Gingiya barracks, Dange Shuni LGA in Sokoto South senatorial zone was being taken as study areas. By the virtue of its origin, the state comprises mostly Hausa/Fulani and other groups such as Gobirawa, Zabarmawa, Kabawa, Adarawa, Arawa, Nupes, Yorubas, Igbos and others. The Sokoto township is in dry Sahel surrounded by sandy terrain and isolated hills. Rainfall starts late that is in June and ends in September but may sometimes extend into October. The average annual rainfall is 550 mm with peak in the month August. The highest temperatures of 45°C during the hot season are experienced in the months of March and April. Harmattan a dry, cold and dusty condition is experienced between the months of November and February [6].

Ethical approval

Ethical clearances were obtained from the Ethical Committee of the 1Brigade medical centre, Ginginya barrack, Sokoto and seek permission for collection data. This study was conducted in accordance with the Declaration of Helsinki, and the protocol was approved by the ethical research committee of the 1Brigade medical Centre, Ginginya barrack, Sokoto.

Population of the study

The accessible population of the study consisted of an estimated three thousand (3,000) adults (female/male) (18-70 years) in army barrack area.

Materials and Methods

Sample/sampling technique

The sample for the study consisted of 300 (three hundred) adult females randomly drawn areas in Sokoto metropolis. Ten percentage (10%) of the accessible population was used as sample size, Nwana [4] opined that if the population is in few thousand 10% will be appropriate as the sample size.

Instrument for data collection

The main instrument for data collection consisted of structured questionnaire. The structured questionnaire was in three sections A and B. Section A, was made up of three questions on demographic data (age, sex, level of education and service status). Section B contained nine (9) questions on behavioral practices on malaria disease preventive measures.

Scope of the study

The study was delimited to the level behavioral practices on malaria disease preventive measures among adults (18-70 years) in Sokoto metropolis. It was delimited to independent variables of age, gender, service status and levels of education. It was further delimited to adults (18-70 years) in area such as army barrack area and environ that make up Sokoto metropolis. It involved young adult age (18-40), middle adult (41-65) and older adult above 65 years. It was delimited to the use of structured questionnaire as the main instrument for data collection. Finally, it was delimited to the use of descriptive statistic of frequency and percentage as well as inferential statistic of chi square at 0.05 level of significant for data analysis.

Method of data analysis

Data collected were analyzed using descriptive statistic of frequency count, normative percentage and grand mean; as well as inferential statistics of chi-square ($\chi 2$). The level of significant was fixed at 0.05. Appropriate degrees of freedom were worked out.

Data Presentation and Analysis

The chapter deals with data presentation, analysis and discussion of the results obtained based on the objectives, and the research questions of the study as well as the hypotheses. Research questions were answered using percentages (%), null hypotheses were tested using inferential statistics of chi-square. The level of significance was set at 0.05.

Result

Two hundred and seventy (270) copies of the structured interview distributed representing (90%) were returned and used for data analysis.

Research question 1: What is the level of influence of gender on the behavioral practices on malaria disease preventive measures adopted by adults in Sokoto metropolis?

Hypotheses 1: There is no significant difference in the age on the behavioral practices on malaria disease preventive measures adopted by adults in Sokoto metropolis.

Table 1. *Frequency distribution male and female respondents on behavioural practice preventing malaria infection/transmission.*

Frequency Distribution	male n (%)		Female n (%)	
	No	Yes	No	Yes
Do you fumigate your house once a week or more?	109(40)	31(11)	33(12)	97(36)
Is there a farm yard very close to your house?	87(32)	53(20)	67(25)	53(20)
Do you use protective wear when farming?	54(20)	86(32)	41(15)	89(33)
Do you wear trouser, socks and long sleeve when sleeping?	52(19)	88(33)	44(16)	86(32)
Has your environment been fumigated once or more within the last two months?	119(44)	21(8)	96(36)	34(13)
Do you encourage people to sleep in treated net?	62(23)	78(29)	78(29)	62(23)
Do you sleep in mosquito treated net at night?	83(31)	57(21)	103(38)	27(10)
If you have children, would your children sleep in treated net?	71(26)	69(26)	75(28)	55(20)
$\chi 2=13269$, $\chi 20.05=32.671$; df=2, $p<0.05$				

Table 1 above represent the male and female respondents on behavioral practices preventing malaria infection/transmission based on gender. The results show that male respondents yes on fumigating house once a week or more 31(11%) while the female 97(36%) yes,farm yard close to the house male 53(20%) yes same to female 53(20%) yes, on the use of protective wear when farming male 86(32%) yes when compared to female of 89(33%) yes, on the use of trouser, socks and long sleeve when sleeping male 88(33) yes while the female had 86(32%), on fumigating of environment 21(8%) yes for male while the female 34(13%) yes, on encouraging people to sleep in treated net male 78(29%) do and female 62(23%) do, among the respondents those who slept in treated net the male were found to be using very high rate about 57(21%) when compared to female 27(10%) usage. General male 69(26%) tend to employ their children to use treated net when compared to female 55(%). The male respondents had good behavioral practices that prevent malaria infection/transmission. Therefore, female had significantly good behavioral practices than the male gender. When the data were subject to chi-square analysis to test whether there is significant difference between male and female respondents.

(a)In the behavioral practices preventing malaria infection/ transmission, the calculated chi-square ($\chi2$=13269, is greater than the tabulated $\chi2$=32.671 at df=21, $p<0.05$). Therefore, the null hypotheses were rejected and conclusion drawn that there is a significant difference between male and female respondents in the behavioral practices preventing malaria infection/transmission. The male exhibited good behavioral practices preventing malaria infection/transmission than the female gender.

Research question 2: What is the influence of age groups on the behavioral practices on malaria disease preventive measures adopted by adults in Sokoto metropolis?

Hypotheses 2: There is no significant difference in the age on the behavioral practices on malaria disease preventive measures adopted by adults in Sokoto metropolis.

Table 2 below represent the 18-30 years,31-45 years and 46-70 years respondents on behavioral practices preventing malaria infection/transmission based on age groups. The results show that respondents 78(29%), 28(10.4%) and 22(8%) yes across 18-30 years, 31-45 years and 46-70 years respectively on fumigating house once a week or more. On the use of protective wear when farming 71(26%), 67(25%) and 37(14%) yes in 18-30 years, 31-45 years and 46-70 years ages respectively. On the use of trouser, socks and long sleeve when sleeping 68(25%), 67(25%) and 39(14%) said yes in 18-30 years, 31-45 years and 46-70 years age respectively. On fumigating of environment 28(10%), 8(3%) and 19(7%) yes in 18-30 years, 31-45 years and 46-70 years ages respectively. Those who encourage people to sleep in treated net 65(24%), 50(19%) and low 15(6%) yes in 18-30 years, 31-45 years and 46-70 years ages respectively. Those who slept in treated net were 38(14%), 35(13%) and low 11(4%) yes in 18-30 years, 31-45 years and 46-70 years ages respectively. Those who allow their children to use treated net showed 84(31%), 27(10%) and low 13(5%) yes in 18-30 years, 31-45 years and 46-70 years ages respectively. There were significantly good behavioral practices across the age groups. The age 18-30 years had good behavioral practice may because of the in experience in life and fear hence trying to avoid complication that might arise from mosquito bite. When the data were subject to chi-square analysis to test whether there is significant difference across different age groups.

(a)In the behavioral practices preventing malaria infection/ transmission, the calculated chi-square ($\chi2$=12764.8, is greater than the tabulated $\chi2$=61.63 at df=49, $p<0.05$). Therefore, the null hypotheses were rejected and conclusion drawn that there is a significant difference between the different age groups in the behavioral practices preventing malaria infection/transmission.

Research question 3: What is the influence of educational level on the behavioral practices on malaria disease preventive measures adopted by adults in Sokoto metropolis?

Hypothesis 3: There is no significant difference on educational level on behavioral practices on malaria disease preventive measures adopted by adults in Sokoto metropolis.

Table 3 below represent the respondents on behavioral practices preventing malaria infection based on educational levels. The results showed that respondents 2(0.4%), 15(6%), 63(23%) and 47(17%) yes across Non-formal educational level, Primary Educational level, Secondary Educational level and Tertiary Educational level respectively on those who fumigated their house. On those who had farm yard close to their house 1(0.4%), 0(0%), 65(24%) and 50(199%) yes in Non-formal educational

Table 2. *Frequency distribution age group respondents on behavioural practice preventing malaria infection/transmission.*

Frequency Distribution	18-30 years n (%)		31-45 years n (%)		46-70 years n (%)	
	No	Yes	No	Yes	No	Yes
Do you fumigate your house once a week or more?	42(16)	78(29)	72(27)	28(10.4)	28(10.4)	22(8)
Is there a farm yard very close to your house?	68(25)	52(19)	56(21)	44(16)	30(11)	20(7)
Do you use protective wear when farming?	49(18)	71(26)	33(12)	67(25)	13(5)	37(14)
Do you wear trouser, socks and long sleeve when sleeping?	52(19)	68(25)	33(12)	67(25)	11(4)	39(14)
Has your environment been fumigated once or more within the last two months?	92(34)	28(10)	92(34)	8(3)	31(11)	19(7)
Do you encourage people to sleep in treated net?	55(20)	65(24)	50(19)	50(19)	35(13)	15(6)
Do you sleep in mosquito treated net at night?	82(30)	38(14)	65(24)	35(13)	39(14)	11(4)
If you have children, would your children sleep in treated net?	36(13)	84(31)	73(27)	27(10)	37(14)	13(5)
$\chi2$=12925, $\chi2$ 0.05=61.67; df=49, $p<0.05$						

Table 3. *Frequency distribution educational level respondents on behavioural practice preventing malaria infection/transmission.*

Frequency Distribution	Non-formal edu.		Pri. Edu.		Sec.Edu		Tertiary Edu.	
	n (%)		n (%)		n (%)		n (%)	
	No	Yes	No	Yes	No	Yes	No	Yes
Do you fumigate your house once a week or more?	2(0.4)	2(0.4)	3(1)	15(6)	11(4)	63(23)	127(47)	47(17)
Is there a farm yard very close to your house?	3(1)	1(0.4)	18(7)	0(0)	9(3.3)	65(24)	124(46)	50(19)
Do you use protective wear when farming?	4(1.5)	0(0)	16(6)	2(0.4)	14(5)	64(24)	61(23)	113(42)
Do you wear trouser, socks and long sleeve when sleeping?	4(1.5)	0(0)	16(6)	2(0.4)	65(24)	9(3.3)	130(48)	44(16)
Has your environment been fumigated once or more within the last two months?	1(0.4)	3(1)	6(2)	12(4)	10(4)	64(24)	72(27)	102(38)
Do you encourage people to sleep in treated net?	1(0.4)	3(1)	0(0)	18(7)	24(9)	50(19)	115(43)	59(22)
Do you sleep in mosquito treated net at night?	1(0.4)	3(1)	3(1)	15(6)	28(10)	46(17)	144(53)	30(11)
If you have children, would your children sleep in treated net?	3(1)	1(0.4)	3(1)	15(6)	26(10)	48(18)	114(42)	60(22)
$\chi2=12384$, $\chi2$ 0.05=5.99; df=35, $p<0.05$								

level, Primary Educational level, Secondary Educational level and Tertiary Educational level respectively. On use of protective wear when farming 0(0%), 2(0.4%), 64(24%) and 113(42%) said yes Non-formal educational level, Primary Educational level, Secondary Educational level and Tertiary Educational level respectively on the use of trouser, socks and long sleeve when sleeping 0(0%), 2(0.4%), 9(3.3%) and 44(16%) yes Non-formal educational level., Primary Educational level, Secondary Educational level and Tertiary Educational level respectively. Those fumigated their environment 3(1%), 12(4%), 64(24%) and 102(38%) yes across Non-formal educational level., Primary Educational level, Secondary Educational level and Tertiary Educational level respectively this could be due to high cost of chemical insecticide and government failure to fumigate as part of environmental health services. Those who encourage people to sleep in treated net 3(1%), 18(7%), 50(19%) and 59(22%) yes Non-formal educational level., Primary Educational level, Secondary Educational level and Tertiary Educational level respectively. Those who slept in treated net were 3(1%), 15(6%), 46(17%) and 30(11%) yes Non-formal educational level., Primary Educational level, Secondary Educational level and Tertiary Educational level respectively. Those who allow their children to use treated net showed1 (0.4%), 15(6%), 48(18%) and 60(22%) yes Non-formal educational level., Primary Educational level, Secondary Educational level and Tertiary Educational level respectively. There were significantly good behavioral practices at secondary educational level followed by those with tertiary educational levels. When the data were subject to chi-square analysis to test whether there is significant difference between different educational levels.

(a) In the behavioral practices preventing malaria disease infection/transmission, the calculated chi-square ($\chi2=12384$ is greater than the tabulated $\chi2=61.63$ at df=49, $p<0.05$). Therefore, the null hypotheses were rejected and conclusion drawn that there is a significant difference between the different educational level in the behavioral practices preventing malaria disease infection/transmission.

Discussion

Prevention strategies aimed specifically at preventing malaria infection. The strategies include the use of insecticide-treated bed nets, indoor residual insecticide spraying, environmental control (mosquito breeding site or "source" reduction), other personal protection measures (e.g. use of repellent soap or screening windows). Reduction of overall malaria infection rates or transmission rates have an indirect impact on development of drug resistance by reducing the number of infections needing to be treated.

Question 1sought to determine the influence of gender on behavioral practices that prevent malaria disease infection/transmission. The research showed that significant amount of female 97(36%) yes had their house fumigated once a week or more when compared to male 31(11%), these showed that women are more domesticated at home, and it will greatly reduce mosquito breeding in their houses. On farm yard close to residential home there was no significant difference between male and female 53(20%) yes each while 87(32%) and 67(25%) said no for male and female respectively. Bush are good breeding site for mosquito a malaria vector, hence the proximity to houses to farm yard increases mosquito bite. Farming activity predisposes individual to mosquito bite hence the use of protective wear when farming reduces malaria disease infection/transmission. On this subject 89(33%) and 86(32%) use protective wears when farming. The uses trouser, socks and long sleeve when sleeping was 88(33%) and 86(32%) for male and female respectively. Few subjects had their environment fumigated 24(8%) and 62(23%) for male and female respectively, this is very poor since it is a good preventive strategy globally and prevent malaria transmission [2]. Among the subject those who encourage people sleeping mosquito treated net where 78(29%) and 62(23%) for male and female respectively. Among the subjects the use of mosquito treated net was very poor 21(10%) and 57(21%) for male and female respectively. Among those who would have their children sleep in treated net 55(20%) and 69(26%) yes do while 71(26%) and 75(28%) for male and female respectively. There

was a significant difference chi-square ($\chi2$=13269, is greater than the tabulated $\chi2$=32.671 at df=21, $p<0.05$). Therefore, the null hypotheses were rejected and conclusion drawn that there is a significant difference between male and female respondents in the behavioral practices promoting malaria drug resistance. The male possessed high level of knowledge of preventive measures than the female gender. Derakhshan, Shahin, Fatema, Babak, Roya, and Hamid [7] reported that the level of knowledge of preventive measures among women is at highest significantly after education.

Research question 2 sought to determine the influence of age on behavioral practices preventing malaria infection/ transmission, 78(29%), 28(10.4%) and 22(8%) for 18-30 years,31-45 years and 46-70 years respectively had their home fumigated although the practices was low 31-45 years and 46-70 years. Fumigation eradicate the vector mosquito, poor control increases mosquito bite. Few 52(26%), 44(16%) and 20(7%) across 18-30 years,31-45 years and 46-70 years respectively had farm yard very close to their houses this reduce the environmental factor that promote the vector bred. The use of protective wear when farming was high 71(26%), 44(16%) and 37(14%) for 18-30 years,31-45 years and 46-70 years respectively this prevented must subjects from mosquito bite on the farm. The use of trouser, socks and long sleeve when sleeping was high 68(25%), 67(25%) and 39(14%) for 18-30 years,31-45 years and 46-70 years respectively to prevent vector bite. Fumigation of environment was low 28(10%), 8(3%) and 19(7%) for 18-30 years,31-45 years and 46-70 years respectively. Fumigation of the environment is expensive and only the government can successfully fumigate the large square meter of land, except for the few citizens who fumigate a small area which will not be very effective. In this country government really fumigate the environ. In this research most respondents 65(24%) and 50(19%) 18-30 year and 31-45 years respectively and few 15(4%) in 46-70 years promote sleeping in treated net, although few respondents sleep in treated net 34(14%), 35(13%) and 11(4%) for 18-30 years,31-45 years and 46-70 years respectively. This is because most respondents said that the net causes heat and uncomfortable. In age 18-30 years 84(31%) significantly promote children sleeping in the net, while very few 35(13%) and 11(4%)31-45 years and 46-70 years respectively. Where was a significant difference the calculated chi-square ($\chi2$=12764.8, is greater than the tabulated $\chi2$=61.63 at df=49, $p<0.05$). Therefore, the null hypotheses were rejected and conclusion drawn that there is a significant difference between the different age groups in the behavioral practices preventing malaria disease infection/transmission.

Research question 3 sought to determine influence of educational level on the behavioral practices that prevent malaria disease infection/transmission. The effect of fumigation of mosquito vector us lethal at such reducing the population of the vector which transmit malaria parasite. Those who fumigated their houses was very low, 2(0.4%), 15(6%) and 47(17%) non-formal education, primary education, and tertiary education respectively and high 63(23%) in secondary education. Mosquito breeding habitat which is promoted by farm yard, it closeness to houses means increase mosquito bite since the vector are highly found in the farm yard thereby increase transmission among respondents, although few 1(0.4%), 0(0%) and 50(19%) in non-formal education, primary education and tertiary education had farm yard close to their houses while those with secondary education status most 63(24%) had farm yard close to the house. The use of protective wear when in farm was significantly exhibited 64(24%) and 113(42%) in secondary and tertiary educational level respectively and few 0(0%) and 2(0.4%) in non-formal and primary educational status. the calculated chi-square ($\chi2$=12384 is greater than the tabulated $\chi2$=61.63 at df=49, $p<0.05$). Therefore, the null hypotheses were rejected and conclusion drawn that there is a significant difference between the different educational level in the behavioral practices preventing malaria disease infection/transmission. Across the subject the use of trouser, socks and long sleeve when sleeping was poorly practiced 0(0%), 2(0.4%), 9(3.3%) and 44 (16%) yes for Non-formal educational level, Primary Educational level, Secondary Educational level and Tertiary Educational level respectively. Those who had their environment was high 3(1%), 12(4%), 64(24%) and 102(38%) for Non-formal educational level, Primary Educational level, Secondary Educational level and Tertiary Educational level respectively. Significant number of subject encouraged the use of treated net 3(1%), 18(7%), 50(19%) and 59(22%) in Non-formal educational level, Primary Educational level, Secondary Educational level and Tertiary Educational level respectively. Those who slept in treated net was high 3(1%), 15(6%) and 46(17%) for Non-formal educational level., Primary Educational level, Secondary Educational level respectively and low in 30(11%) in Tertiary Educational level. Subject who will allow their children to sleep in treated net was high 15(6%), 48(18%) and 60(22%), Primary Educational level, Secondary Educational level and Tertiary Educational level respectively low 1(0.4%) for non-formal educational level. Onyekwere, Ezebuiro and Samuel [8] reported subject with tertiary education (x=69.69%) were slightly higher than those with secondary education (x=60.48%), without formal education (x=48.50%) and those with primary education (x=47.41%), tertiary education exhibited good behavioral factors in life when compare to those with secondary or primary education. The general behavioral practice preventing malaria infection/transmission by the respondents was poor on the basic strategies from fumigation of house, use of protective wears and the use of treated net considering the menace of malaria disease morbidity and mortality with its economic consequence Clark [9-13]. If ninety-nine percent of the population could practice these strategies 100% which is achievable, the rate of malaria infection/transmission will reduce drastically or eliminated, when it was subjected to statistical significant there was statistically significant difference calculated chi-square ($\chi2$=12384 is greater than the tabulated $\chi2$=61.63 at df=49, $p<0.05$).

Conclusion

The behavioral practices preventing malaria disease infection/ transmission among was not generally good across the ages, gender and educational level hence the control of malaria disease is impeded. There was influence age, gender and educational level on behavioral practices preventing malaria disease infection/transmission. Malaria control must start with good behavioral practice which includes the use of insecticide-treated

bed nets, indoor residual insecticide spraying, environmental control (mosquito breeding site or "source" reduction), other personal protection measures (e.g. use of repellent soap or screening windows).

Recommendations

a. Malaria control and prevention efforts need to be designed for the specific environment in which they will be used and need to take into account the local epidemiology of malaria and the level of available resources and political will.

b. Government should evolve fumigation programme for both urban and rural area at all level that will be functional ensuring constant environmental fumigation must especially during raining season since at that period mosquito is at high breeding rate.

c. Malaria disease treatment should be included in the free test and treatment worldwide as it is for Tuberculosis.

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