KNOWLEDGE AND ATTITUDE TOWARDS PREVENTION AND CONTROL OF MALARIA IN NIGERIA – THE IMPLICATIONS

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ABSTRACT

OBJECTIVES

To ascertain the level of knowledge about malaria, its prevention, and control; to determine the relationship between knowledge acquisition and malaria disease; and to determine malaria treatment preference with regards to what and where malaria treatment(s) are received in the community.

METHODS

This cross sectional study used semi-structured questionnaires to gather information from participants in Ukwuani Local Government Area of Nigeria. Trained interviewers used direct one-on-one interviews. Collected data were analysed using Statistical Package for Social Sciences (SPSS) version 21.

RESULTS

From a total of 262 participants, 100 (38.17%) respondents didn't actually know what malaria is, 85 (32.44%) didn't really know the cause of malaria, and only 109 (41.6%) participants practice some form of malaria prevention and control. A logistic regression analysis of malaria incidence in the last four weeks as the dependent variable, and levels of educational qualification as the independent variable gave a significance of <0.05. Out of the total 46 respondents who got infected with malaria disease in the last four weeks, 21 (45.65%) did not attend any health facility, but opted for self medication.

CONCLUSION

The level of knowledge about malaria, its prevention, and control can be improved on through well planned consistent health promotion.

KEYWORDS

Knowledge and attitude, malaria, prevention and control, Nigeria.

INTRODUCTION

Malaria is a major public health problem in Nigeria and is sometimes not given serious consideration by the public. Malaria affects about 3.3 billion people globally and countries in the sub-Saharan Africa accounts for most deaths. Asia, Latin America, and to a lesser extent the Middle East and parts of Europe are also affected (WHO, 2013; WHO, 2014). Malaria is an important cause of morbidity and mortality especially among children and pregnant women in sub-Saharan Africa; and prompt access to diagnosis and treatment with effective anti-malarial drugs is a central component of the World Health Organization's (WHO) strategy for malaria control (Okwundu et al., 2013; WHO, 2013).

Malaria disease is a major health problem in much of the tropics and subtropics. In some areas of the world, mosquitoes that carry malaria have developed resistance to insecticides. In addition, the parasites have developed resistance to some antibiotics. These conditions have led to difficulty in controlling both the rate of infection and spread of this disease (Fairhurst and Wellems, 2009; NCBI, 2014).

BACKGROUND

Malaria is a life-threatening disease caused by Plasmodium parasites that are transmitted to people through the bites of infected Anopheles mosquitoes, which bite mainly between dusk and dawn; and it is preventable and curable. After infection, the parasites travel through the bloodstream to the liver. The parasites enter the bloodstream and infect red blood cells. An infected pregnant woman can transmit malaria to her unborn child (Olorunfemi, 2013; WHO, 2014).

Okoli and Enna (2014) reported in a study done in Plateau State of Nigeria that of 640 children, 78.8% were aware that malaria is caused by a mosquito bite and there were mosquito breeding sites in most of the respondents' homes and in the community. Abate et al. (2013) and Kimbi et al. (2014) also reported that most of the respondents in their study attributed the cause of malaria to mosquito bite.

There are four parasite species that cause malaria in humans i.e. Plasmodium falciparum, Plasmodium vivax, Plasmodium malariae and Plasmodium ovale. Plasmodium falciparum and

Plasmodium vivax are the most common while Plasmodium falciparum is the most deadly. In recent years, some human cases of malaria have occurred with Plasmodium knowlesi specie that causes malaria among monkeys and occurs in certain forested areas of South-East Asia). Anopheles mosquitoes breed in water and each species has its own breeding preference (Fairhurst and Wellems, 2009; WHO, 2014; NCBI, 2014).

Transmission depends on climatic conditions that may affect the number and survival of mosquitoes, such as rainfall patterns, temperature and humidity. In many places, transmission is seasonal, with the peak during and just after the rainy season. Human immunity is another important factor, especially among adults in areas of moderate or intense transmission conditions. Partial immunity is developed over years of exposure, and while it never provides complete protection, it does reduce the risk that malaria infection will cause severe disease. For this reason, most malaria deaths in Africa occur in young children, whereas in areas with less transmission and low immunity, all age groups are at risk. (WHO, 2014; NCBI, 2014).

Vector control is the main way to reduce malaria transmission at the community level, and it is the only intervention that can reduce malaria transmission from very high levels to close to zero. Personal protection against mosquito bites represents the first line of defense for malaria prevention. Two effective forms of vector control include Insecticide-treated mosquito nets (ITNs) and indoor residual spraying (IRS) with insecticides. IRS has helped to eliminate malaria from great parts of Asia, Russia, Europe, and Latin America. Long-lasting insecticidal nets (LLINs) are the preferred form of ITNs for public health distribution programmes. WHO recommends coverage for all at-risk persons, and the most cost effective way to achieve this is through provision of free LLINs for sleeping every night. (Pluess et al., 2010; WHO, 2013; NCBI, 2014).

Adeneye et al. (2007) reported in a pilot study done in Ogun State of Nigeria that 63.2% of respondents had heard of ITNs but only 22.1% used them. Legesse and Deressa (2009) in Ethiopia also reported that 9.6%, 2.7% and 0.4% of their study population took antimalaria medication, carried out environmental hygiene, and used insecticide spray, respectively, as methods of malaria prevention and control.

In 2012, malaria caused an estimated 627,000 deaths, mostly among African children where a child dies every minute from malaria. But mortality rates among African children have been reduced by an estimated 54% since 2000. Increase in malaria prevention and control measures are dramatically reducing the malaria burden in many places. (Okell et al., 2008; WHO, 2013; WHO, 2014).

The WHO Guidelines for the treatment of malaria emphasises the importance of malaria case management as a vital component of malaria control strategies (WHO, 2010). Early diagnosis and treatment of malaria reduces disease and prevents deaths. It also contributes to reducing malaria transmission. The best available treatment, particularly for P. falciparum malaria, is

artemisinin-based combination therapy (ACT). WHO recommends that all cases of suspected malaria be confirmed using parasite-based diagnostic before treatment. Anti-malarial medicines can also be used to prevent malaria through chemoprophylaxis, which suppresses the blood stage of malaria infections, thereby preventing malaria disease. (Okell et al., 2008; Nadjm et al., 2010; WHO, 2010; WHO, 2014).

Although malaria has successfully been eliminated in most of the developed countries, it can still be seen as a threat in the form of a possible reemerging infectious disease in these developed countries, if not successfully tackled globally.

Knowledge is improved upon through relevant information feeds while attitude deals with the mind set (Jeffrey, 2014). Appropriate Knowledge is relevant for solving daily challenges and the right knowledge, attitude, and practice towards malaria prevention and control will go a long way to reduce the burden associated with malaria infection in Nigeria and the world in general.

OBJECTIVES OF THE STUDY

The objectives of this study are:

1. To ascertain the level of knowledge about malaria, its prevention, and control in the community
2. To determine the relationship between knowledge acquisition (estimated via level of educational qualification) and malaria disease in the community, and
3. To determine where treatment is received by individuals affected by malaria disease in the community.

METHOD OF STUDY

This is a cross sectional study and made use of questionnaires through direct one-on-one interviews for information gathering. The questionnaires contained semi structured questions. The interviewers were selected and trained on information gathering using the questionnaire. A convenience sampling technique was used in this study.

This study was done in Ukwuani Local Government Area, located in the north senatorial district of Delta State, Nigeria. Three communities were selected for this study, namely Obiaruku, Ezionum, and Akoko-Uno with population sizes of 11,582, 10,337, and 10,680 respectively, with a total population of 32,599 people. These communities are indigenous to the Ukwuani ethnic group in Nigeria. Obiaruku is semi-urban while Ezionum and Akoko-Uno are both rural and predominantly farming communities. (Delta State, 2014).

The sample size calculation gave a recommended size of 380 people. A 5% margin of error, 95% confidence level, and a response distribution of 50% was used for the sample size calculation.

The questions that were asked the participants included: knowledge of malaria disease and its cause; personal malaria disease experience in the last four weeks; malaria treatment preference with regards to what and where treatment was received; knowledge on prevention and control of malaria disease; and actual practice of the correctly stated malaria prevention and control methods. The socio-demographic characteristics of the participants were also obtained. Informed consent was obtained from participants before data collection.

The collected data were cleaned, coded and entered into Statistical Package for Social Sciences (SPSS) version 21 for windows software for analysis. A descriptive presentation of the data was given, and a logistic regression analysis was done using the incidence of malaria disease in the last four weeks as the outcome or dependent variable, and the levels of educational qualification (indicating knowledge acquisition) as the independent or exposure variables The variables age and sex were also included as covariates.

The different biases (i.e. Non-sampling) encountered in this study include: non-response - this can be minimized by increasing the sample size; and measurement error - this was resolved by writing clear and simple questions, and proper training and supervision of survey workers.

INCLUSION AND EXCLUSION CRITERIA

Teenagers (15 years and above), men and women, who are resident in the 3 communities surveyed were included in this study. Respondents below the age of 15 years and individuals having mental challenges were excluded from this study.

RESULTS

The age of respondents ranges between 15 years and 84 years, with a mean of 27.82 years and a standard deviation of 12.96. There were 134 female (51.1%) and 128 (48.9%) male participants.

From the 262 respondents, 145 (55.3%) are actively engaged in employment (i.e. self employed, private or public sector), 11 (4.2%) are unemployed, 104 (39.7%) are students, while 2 (0.8%) are retirees. The respondents' academic qualifications are as shown on the bar chart in Figure 1 below. The distribution of participants from Obiaruku, Ezionum, and Akoko-Uno are: 110 (42%), 65 (24.8%), and 87 (33.2%) respectively.

LEVEL OF KNOWLEDGE ABOUT MALARIA PREVENTION AND CONTROL IN THE COMMUNITY

From the cross tabulation in Table 1 below, 227 respondents claimed they knew what malaria is, but only 162 actually knew and 65 did not; 100 (38.17%) of the total respondents didn't really know what malaria is.

From the cross tabulation in Table 2 below, 210 respondents claimed they knew what cause malaria, but only 177 actually knew and 33 did not; 85 (32.44%) of the total respondents didn't really know the cause of malaria.

Table 1: Cross tabulation of respondents that claimed to know what malaria is and those who actually know.

	Actually know what malaria is	**Don't really know what malaria is**	**Total**
Claim to know what malaria is	162	65	227
Don't know what malaria is	0	35	35
Total	162	100	262

Table 2: Cross tabulation of respondents that claimed to know the cause of malaria and those who actually know.

	Actually know what cause malaria	**Don't really know what cause malaria**	**Total**
Claim to know what cause malaria	177	33	210
Don't know what cause malaria	0	52	52
Total	177	85	262

Out of 191 respondents who claim to know how to prevent and/or control malaria, 159 actually know how to, but 32 didn't. Out of the 159 who actually know how to prevent malaria, 109

respondents practice the malaria prevention and/or control they mentioned while 50 didn't. Therefore, out of 262 participants, only 109 (41.6%) participants practice some form of malaria prevention and control.

RELATIONSHIP BETWEEN KNOWLEDGE ACQUISITION (ESTIMATED VIA LEVEL OF EDUCATIONAL QUALIFICATION) AND MALARIA DISEASE IN THE COMMUNITY

The results from the logistic regression analysis are shown on Table 3 below.

The significance column on Table 3 reveals a significance value of <0.05 (i.e. p-value of 0.000) for level of educational qualification of participants. Therefore, it contributes significantly to the logistic regression model.

The odds for a female contracting malaria disease are 1.397 times higher than the odds for the male.

Table 3: Results of logistic regression

Variables	**P-value**	**Odds ratio (OR)**	**95% Confidence Interval for OR**
Qualification	0.000		
No Acad Qual.	0.109	0.332	0.086-1.276
Pry Sch Cert.	0.000	0.056	0.015-0.212
Junior Sch Cert.	0.001	0.058	0.011-0.307
Sen S. Sch Cert.	0.000	0.175	0.067-0.460
Age	0.213	1.018	0.990-1.046
Sex	0.349	1.397	0.694-2.813

PLACE WHERE TREATMENT IS RECEIVED BY INDIVIDUALS AFFECTED BY MALARIA DISEASE IN THE COMMUNITY

Out of the 46 respondents that claimed they had the malaria disease in the last four weeks: 25 of them received anti-malaria treatment in the hospital or health center, 18 received treatment at home and purchased anti-malaria drugs from patent medicine shops, while 3 received traditional treatment using herbs. 21 (45.65%) respondents who had malaria disease in the last four weeks did not attend any health facility, but opted for self medication. The prevalence of malaria disease in this population of 262 participants within the last four weeks just before the study is 17.56%.

DISCUSSION

About a third of the respondents in this study didn't actually know what malaria is, and also didn't really know the cause of malaria. The results of this study do not comport with findings from other relevant studies. This could be as a result of the manner the questions were structured to probe beyond superficial broad based knowledge of malaria cause, prevention and control. For example, participants were not just asked if they knew what malaria is or the cause, but were asked to specifically identify what it is and its cause. This disparity could also be due to the level of exposure to appropriate information about malaria in the rural areas because this study was carried out in predominantly rural communities.

The 2013 World Malaria Report revealed that malaria mortality rates were reduced by about 42% globally and by 49% in the WHO African Region between 2000 and 2012. Also, during the same period, malaria incidence rates declined by 25% around the world, and by 31% in the African Region. The report concluded that these substantial reductions occurred as a result of a major scale-up of vector control interventions, diagnostic testing, and treatment with artemisinin-based combination therapies, or ACTs. (WHO, 2013; UNICEF, 2014).

A study on the use of mosquito coil in malaria prevention revealed interesting findings (Lawrence and Croft, 2004) that are consistent with practices of some of the participants in this study. Barely half the participants in this study practiced some form of malaria prevention and control. Okoli and Enna (2014) reported in their study that some participants used mosquito coils, insecticide paper, insecticide spray, antimalaria therapy, and environmental hygiene and herbal leaves as malaria prevention and control measures. The results of their study also showed that there was increased ownership and use of ITNs at community level, the level of environmental and personal hygiene was low, and the existence of mosquitoes breeding sites was high.

Adopting new vector control tools through evidence-informed health policy making (Vontas et al., 2014) in combination with health education and promotion could be effective in the push

towards global malaria elimination. The Integrated Vector Management (IVM) defined as "a rational decision-making process for the optimal use of resources for vector control", includes five key elements: i.e. evidence-based decision-making; integrated approaches; collaboration within the health sector and with other sectors; advocacy, social mobilization, and legislation; and capacity-building. The WHO adopted IVM globally in 2004 for the control of all vector-borne diseases (Beier et al., 2008).

The use of health facilities as the most common sources of treatment is consistent with previous studies from other parts of Africa and India. (Khumbulani et. al, 2009; Salwa et al., 2009; Lora et al., 2010; Abate et al., 2013). Traditional medicines as reported in other studies (Ahmed et al., 2009; Salwa et al., 2009; Abate et al., 2013) were also a source of treatment for malaria in this study.

Despite the reported fall in malaria transmission in much of sub-Saharan Africa, malaria still remains a leading cause of inpatient admissions and mortality (Crawley et al., 2010; Nadjm et al., 2010; Yoel et al., 2011). Limited access to utilization of malaria control services still affects millions of children, especially those that live in hard to reach or rural areas with weak or non-existent health systems (UNICEF, 2014).

The progress reported by the 2013 World Malaria Report can be sustained by not just focusing more on treatment modalities, but vigorously embarking on consistent and sustainable health promotion and health education as an aspect of the prevention modalities, to improve the knowledge of the public in the worst affected regions; and also concentrating efforts in the rural communities.

Education (including health education) is an important factor when dealing with the social determinants of health. There is need to incorporate root causes of diseases such as the environmental and social factors (e.g. education, amongst others) with the biomedical approach in dealing with the burden of malaria disease in the African region (WHO, 2003; WHO, 2008).

THE IMPLICATIONS OF THESE RESEARCH FINDINGS

About a third of the respondents in this study didn’t actually know what malaria is, and didn’t really know the cause of malaria. These findings are different from other studies and the lack of awareness about the cause of malaria disease by a third of a population could have effect on the efforts of governmental and non governmental agencies in the drive towards elimination of malaria disease in Nigeria and globally.

The significant relationship between the levels of educational qualification and malaria disease as revealed by this study and also consistent with the social determinant of health paradigm (WHO, 2003) emphasizes the need for education, and educating the populace across all age groups. The consistent application of health education and promotion is needed most especially in the rural communities.

A significant number (45.65%) of respondents who got infected with malaria disease in the last four weeks prior to the study did not attend any health facility, but opted for self medication. This is worrisome because of the challenge of misdiagnosis and development of drug resistance resulting from drug abuse. The practice of and access to quality primary health care is very important in rural communities.

LIMITATIONS

The sample size used for this study is less than the calculated sample size. This was due to circumstances that couldn't be corrected before the final data computation and analysis. The non probability sampling method was used in this study. The use of the right or actual sample size calculated and the probability sampling method would give a more representative result.

CONCLUSION

The level of knowledge about malaria, its prevention, and control can still be improved on. This can be done effectively through well planned consistent health promotion and health education, geared towards malaria prevention, control, and eventual global elimination. Since the level of education attained is a leading social determinant of health and can play a significant role in reducing the malaria burden, education should be encouraged at all levels, especially at the rural communities.

RECOMMENDATIONS

The health promotion and health education component of malaria prevention and control should be emphasized by the organizations (governmental and/or non-governmental) directly or indirectly involved in the move towards the elimination of malaria globally.

Focus should be placed on accessing the remote rural areas which unsurprisingly bear the greatest malaria burden, and also create enabling environment through people friendly policies that will enable them to access basic primary health care needed to drastically reduce the high malaria morbidity and mortality rates.

Emphasis should be placed on the social determinants of health because tackling these determinants has direct positive effect on reducing the malaria disease burden and possibly eliminating malaria disease globally.

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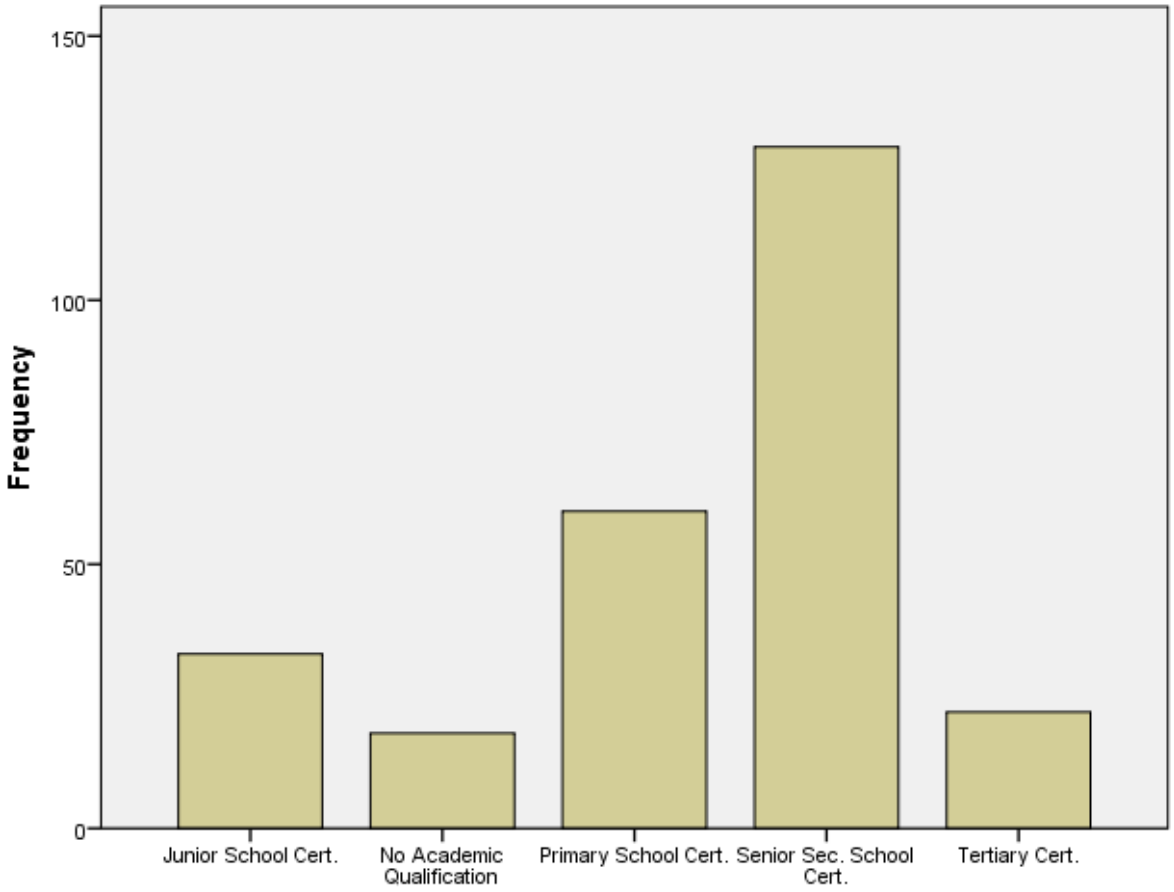

Figure 1: Academic qualification of respondents.

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