
Relationship Between Public Knowledge of Water Bearing Plants and Factors That Promote the Control of Malaria in Boki L.G.A, Cross River State

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ABSTRACT: *This study intended to determine the influence of knowledge of malaria epidemiology and water bearing plant and public participation in malaria prevention and control in Boki local government area, Cross River State. The study was analysed based on the hypotheses postulated to guide the study. The descriptive survey research design was used, 100 samples were used and the stratified random sampling and simple random technique was adopted to select the respondent for the study. Questionnaires were distributed to the respondents and used as an instrument in conducting the research, 100 respondents were given the questionnaires and all of it was retrieved to facilitate precise results of the investigation. The Pearson correlation analysis was used for the data analysis and the following result was obtained –that there is a significant relationship between people knowledge of water bearing plants as a factor that promote the spread of malaria and their participation in malaria prevention and control in the Area.*

KEYWORDS: knowledge, malaria transmission, water bearing plants, participation in malaria prevention, control activities, Boki Local Government Area.

INTROCUCTION

Malaria has being noted to be responsible for 25% of infant mortality and 30% of childhood mortality (FMOH and NMCP, 2009), While everyone is at risk of malaria some categories of people are however at the highest risk of infection. These include children aged less than 5 years pregnant women, visitors from non-malaria endemic, regions, people living with HIV/AIDS and those with sickle cell anaemia (FMOH and NMCP, 2009). Malaria also constitutes a major economic burden among residents of Nigeria especially the people of Boki. It was estimated that, economic burden of malaria in Nigeria cost about 132 billion Naira annually. This cost occur in the form of malaria treatment, prevention and loss of working hours (FMOH and NMCP, 2009). It is obvious that when people possess adequate knowledge of malaria prevention and control they are empowered to participate actively in malaria prevention and control as this will help reduce the morbidity, and mortality rate of the infection in Nigeria.

Thus the thrust of public participation is to increase the level of awareness among entire citizens on the programmes and to make them know the sustainable ways of preventing and controlling of malaria. This project therefore seek to explore the influence of knowledge of malaria epidemiology on public participation in the control and prevention of malaria in Boki Local Government Area. The disease attack both children and adults. However, mortality rate in children is still high because of inadequate knowledge of the possible ways of preventing and controlling Malaria. The children in endemic areas hardly develop any immunity against the disease. Malaria is known to cause a lot of complications and it's characterized by repeated attack and relapse which poses a threat on health as it lowers the victims' resistance, in other infections and may render the individual debilitated. It has been observed that most people participation and commitment on malaria control prevention activities is poor as manifested in their poor use of mosquitoes treated net, poor sanitation, poor drainage management. This study is therefore embarked upon to assess the influence of knowledge of malaria epidemiology on public participation in malaria prevention and control in Boki local government area, of Cross River State.

Objectives

- i.. Examine public knowledge of water bearing plants as a factor of malaria spread and their participation in malaria prevention and control in Boki Local Government Area.

Research hypothesis

- i. There is no significant relationship between people knowledge of water bearing plants as a factor that promote the spread of malaria and their participation in Boki Local Government Area

LITERATURE REVIEW

Knowledge on route of transmission and malaria prevention and control activities

Malaria is one of the most important causes of morbidity and mortality in the world, and remains not only a major cause of much suffering and death, but also the cause of many social and economic problems. Malaria causes over a million deaths each year, and more than 90% of these occur in Africa, south of the Sahara region. In recent years, the region has experienced a dramatic resurgence of this disease and almost with up to 450 million clinical cases of malaria recorded each year. Malaria is responsible for 30-40% of outpatient visits to health facilities, 10-20% of hospital admissions and 10-40% of severe cases in children under five years. Today malaria is the top killer disease in sub-Saharan Africa. (Snow, Azevedo, Lowe, Kabiru, Nevill and Mwankusye, 2004).

In Ethiopia, malaria is at the forefront among the health problems of the country. Due to climatic and geographic factors, the disease occurs in different parts of the country in epidemic form. About 75% of the total area is estimated to be malarious with 65% of the total population, being at risk of the infection. The actual number of malaria cases that occur annually throughout the country are estimated to be about 4-5 million. Public knowledge relating to causation, transmission, prevention, control and treatment are the main socio-cultural factors that can

influence malaria control. (Ministry of Health, 2000; Kloos and Zein, 2003; Agyepong, 2012). The success of malaria control programmes at present relies heavily on public knowledge and practices in the transmission, treatment and control of the disease. Incorrect beliefs or inappropriate behaviour can interfere with the effectiveness of a control measure, such as vector control or chemotherapy. These issues are particularly important in tropical areas where malaria control options are limited because of the parasite and vector resistance to antimalarial drugs and insecticides respectively. In such cases, an understanding of the communities' beliefs and behaviour may be crucial to the success of specific control measures. (Agyepong, 2012). For the participation of the public to be meaningful, the views of the public should be sought and incorporated into any control measures. However, studies done on public knowledge and perception on malaria are scarce in Nigeria. (Adedotun, Morenikeji and Odaibo, 2010).

A study conducted by Wakgari, Ahmed, & Fikre (2006). Disclosed that about sixty percent of the study subjects associated the causes of malaria to the bite of mosquito, while other respondents associated it to exposure to cold, wet weather or change in weather and dirty stagnant water. Regarding malaria transmission, only an estimated 43.7% of the study subjects believed that malaria could be transmitted from person to person. Respondents when asked by wakgari (2006) about how someone is infected with malaria, 65.6% mentioned the bite of infective mosquitoes. Nearly 10% of the respondents related it to a close contact with a patient having malaria, while 13.2% of them associated it with insanitary living conditions. These included drinking unsafe water, eating contaminated food and exposure to a bad odour. Mosquitoes are mainly believed to bite human beings at night (73.2%) and rest in dark places inside houses during daytime (44.3%). The study subjects also thought that mosquitoes rest at the edges of streams (17.3%) and on dirty areas (4.1%). The results from their study showed that knowledge about the transmission, symptoms of malaria and the use of modern anti-malaria drugs and their participation rate in the prevention and control of malaria was very high. All of the study subjects had knowledge of at least one of the classical transmission mode and symptoms, including various methods of preventing and controlling malaria. The knowledge about the transmission and participation to control and prevent malaria is usually high in endemic areas where people are aware of the clinical manifestations of the disease. (Wakgari, Ahmed, & Fikre (2006). However, in a holo-endemic area of western Kenya only approximately 30% of the respondents were aware of malaria symptoms (Ongore, Kamunvi, Knight, & Minawa, (2009). This is very low compared to our findings because malaria may not be considered as a major health problem in the latter community. The communities in the current study are located in an area of unstable or seasonal malaria where the individuals recognize the clinical manifestations of malaria (Kloos and Zein, 2003). With respect to the causes of malaria, most of the study subjects implicated mosquito bite as a possible cause of malaria and indicated that people are infected with malaria by the bite of infected mosquitoes. This awareness in the present study is much higher than the level noted in a study conducted in a similar study carried out in Kenya (Ongore, Kamunvi, Knight, & Minawa, 2009).

This could probably be due to different malaria control interventions undertaken in the current study over the last periods since these studies were undertaken in different times. In Guatemala, however, more than 90% of the informants knew that mosquitoes transmit malaria (Wakgari,

Ahmed, & Fikre 2006) and 93% of the residents believed that a bite of mosquito that has bitten a malaria patient could cause malaria (Wakgari, Ahmed, & Fikre 2006).

Other implied causes of malaria included cold, wet weather or change in weather, dirty stagnant water, and poor personal and sanitary condition. In a study in central Ethiopia, the causes of malaria other than mosquito bite as understood by women also included cold cloudy weather, rain, eating maize stalk, and dirt and flies (Wakgari, Ahmed, & Fikre, 2006).

The knowledge about the transmission of malaria from person to person through mosquito bite is low when compared to the results of a study in central Ethiopia. (Snow, 2004). On the preventability of malaria, however, most of the present study population believed that malaria is a preventable disease in contrast to the findings of the above study in central Ethiopia.

This could be explained by the fact that the activities of Malaria Control Program to prevent and control the disease in the area for the last several years might have enhanced their knowledge on the preventability of malaria and its preventive measures. This difference could also be attributed to the higher educational status of the present study population (30%) compared to the study in central Ethiopia (16.7%). In addition, all the study populations involved in the study conducted in central Ethiopia were women. Generally, in rural communities the literacy rate in men is higher than that of women. (Wakgari, Ahmed, & Fikre, 2006).

According to Wakgari, Ahmed, & Fikre (2006), the knowledge of modern treatment for malaria in this study is high as was reported in the study at central Ethiopia. This knowledge of the modern anti-malarials seemed to be related to the use of these drugs. SP was described as fansidar by the study subjects and seemed to be more popular at the time of survey compared to chloroquine and primaquine. The respondents usually described chloroquine as a white bitter tablet administered over three days, and primaquine by its red colour and small size. In a study of child malaria treatment practices among mothers in Kenya, most mothers mentioned the names of over-the-counter antimalarial drugs, but all could not specify the names of the medications they used (Agyepong, 2012). None of the women in the study conducted in the central Ethiopia could specifically mention chloroquine, the widely used drug in the area, mainly due to little or poor inclination to know the specific names of drugs. (Wakgari, Ahmed, & Fikre, 2006).

The use of modern antimalarial drugs over the traditional remedies is very high in this study. This could be attributed to the long duration of malaria control activities in these areas and the ease of accessibility of antimalarial drugs from different sources. Another important finding in this study is that the respondents knew about the most effective antimalarial drug for the treatment of malaria. SP was mentioned as the most effective drug compared to chloroquine and primaquine. Chloroquine was thought to be ineffective against the treatment of malaria by 41% of the study population. An overall chloroquine resistant *P. falciparum* was reported among 55.6% of the study subjects around Zewai (Ministry of Health, 2000). The treatment of malaria with chloroquine failed to produce acceptable improvement in majority of patients in

most parts of Ethiopia and has been replaced by SP as a first-line drug for the treatment of uncomplicated falciparum malaria (Wakgari, Ahmed, & Fikre, 2006; Snow, et al, 2004).

Temam, Nuredin and Awel, (2017), in their study reported that malaria transmission was remarkably associated with rural environments due to mosquito's affinity for clean, and temporally pools of water, which are the most important in rural areas as anopheline larval sites and as a result proved that there is a relationship between public knowledge of malaria transmission and their participation in malaria prevention and control activities.

In another study done by Castro, Yamagata, and Deomtaslwa (2004), the residents showed high knowledge that malaria transmission and prevention and control methods including risk factors for malaria transmission and infection like location (house near to breeding site and larval habitats) , attributes of houses or living units, socio-economic factors and genetic characteristics of the occupants. The climatic change like heavy rain and higher temperature favor the breeding of mosquitoes.

In another study conducted by Kate, Joseph & Stephen, (2002), they posited that the main components of malaria control strategies include early diagnosis and effective treatment of cases, the application of selective vector control measures such as indoor residual insecticide spray and environmental management and the residents were observed to be very much conversant with these techniques. However, the prevalence of malaria in the country is still high. The also disclosed that inadequate knowledge of local malaria vectors, their ecology and habit have contributed to challenges of the mosquito control programs. On top of these, lack of public awareness on the cause, transmission and prevention methods and attitude and practice toward the use of Insecticide Treated Nets (ITNs) have also contributed to challenges of malaria prevention and control strategy in the country.

In fact, in Ethiopia the most frequently used malaria preventive measures are draining stagnant water, sleeping under mosquito nets and indoor residual spraying

Promoting active community involvement and ownership in malaria control and management through strengthening community based organizations and appropriate health education would be relevant to reduce the prevalence of malaria. Environmental management and ITNs for prevention of malaria are safe, socially acceptable and should be promoted for vector control to reduce the disease burden in the rural communities. (Abate, Degarege and Erko, 2013).

Participation of water bearing plants as a factor of malaria spread and their participation in malaria prevention and control activities

Malaria continues to be a major impediment to health in Africa especially the sub-Sahara region of West Africa, where it frequently takes the greatest toll on young children and pregnant women (World Health Organisation, 2005; Hamel *et al.*, 2011). Malaria epidemics in areas of West Africa have caused considerable morbidity and mortality in the past two decades (Ernst *et al.*, 2006). About 90% of all malaria deaths occur in sub-saharan Africa (Sachs, 2002). More than a million people die of the disease every year, most of them children under the age of five

(Coll-Seck *et al.*, 2008; Wandiga, Opondo, Olago, Githeko, Githui, Marshall, Downs, Opere, Oludhe, Ouma, Yanda, Kangalawe, Kabumbuli, Kathuri, Apindi, Olaka, Ogallo, Mugambi, Sigalla, Nanyunja, Baguma, and Achola, 2010). Some children suffer acute attacks of cerebral malaria that lead to coma and death. Others succumb to severe anemia that follows repeated infections or due to the consequences of low birth weight caused by malaria infection in pregnancy. In severe cases of cerebral malaria, surviving children may be left with epilepsy, speech disorders and blindness (World Health Organisation and United Nations International Children Education Fund, 2003).

These are all caused by adaptability of the mosquito parasite to multiple breeding spot like stagnate water present in plants and flowers. (Qader and Nabi, 2009). Changes in temperature can affect the development and survival of malaria parasites and the vectors that carry them. Rainfall also influences the availability of habitats and the size of mosquito population because as the rain drops water is trapped by the leaves and other parts of the plant thereby serving as suitable breeding site for the mosquito parasites (Wandiga et al., 2010).

In study conducted by Chen, Schlichtherle, & Wahlgren (2000), it was evident that there exist a considerable connexion between people knowledge of water bearing plants as a factor that promote the spread of malaria and their participation; furthermore, Anthropogenic factors may alter malaria transmission dynamics by increasing the emergence of efficient vectors, increasing the number of breeding sites like breeding in water present in plants; through land use change, reduction in vector control activities leading to increased contact between man and the vector in occupational activities and seasonal migration. Increasing malaria transmissions have occurred at times when basic health services and malaria control activities have been in decline. It's evident that with increasing population of mosquito parasite through bushy areas and water stagnate in plants; emerging drug resistance and uncertain drug supplies have compounded this problem. Under these conditions, a rise in observed morbidity and mortality may reflect an increase in malaria transmission and represents a significant problem in national malaria control programmes (Erhun, Agbani, and Adesanya, 2005).

Age is not a factor in temperate climates, but a potent factor in endemic areas, where the degree of infection is related to the duration of exposure of the individual and the community to intense malaria

The environment, composed of physical, biological and socio-economic elements has a potent effect on the transmission of malaria. Temperature, rainfall and humidity determine the physical environment which acts on both man and the mosquito. (Moody and Chiodini, 2000). The presence of stagnant water points in certain plants which provide breeding sites or animals which deviate the blood-feeding habits of Anopheles affect the biological environment. The occupation, habits and activities of human beings produce conditions of social and economic environment which have often a decisive effect on the extent of malaria transmission (Moody and Chiodini, 2000).

Research Design

The research design adopted in this study is descriptive research design

Sample Size and Sampling Technique

The procedure or technique used for selecting the sample for this research is simple random sampling. In order to enhance effective representation, by this method, out of 27 villages in the study area 4 villages were drawn using simple random sampling by balloting. This involved writing names of the villages in 27 pieces of papers which were carefully folded into a container from where 4 independent persons picked a paper each without replacement, in each of the four (4) sampling villages 25 respondents (an adult member of each household) was selected using systematic sampling technique by this method, total number of households in each sampled community was ascertain using primary Health Care (PHC) numbering system. Thereafter sampling frame was calculated, and base on this sampling frame, fraction, respondents were selected at predetermined intervals. This is because the population was assorted and mixed with both young and adult who lived in Boki and have good idea on the influence of knowledge of malaria epidemiology in malaria prevention and control in Osokom, Boki Local Government Area.

Instrument Design

The major instrument used for this research work was structural questionnaire. However, personal interview was also employed. The questionnaire was designed to meet up with the specific objectives. It composes of two section- section A which consisted of personal data and section B which consisted of items in relation to study variables.

Method of Validating Instrument

The instrument used for the purpose of this research was structural questionnaire which was designed to meet up with the objectives of the study. The structured questionnaire become very necessary as it aimed at knowing the influence of knowledge of malaria epidemiology on malaria prevention and control in Osokom clan of Boki Local Government Area. The questionnaire was design with simple straight forward language to enhance understanding. It validity was ensured by subjecting it to face validity by given draft instrument to an expert in research and statistics to vet and their expert advice and suggestions were done. The instrument was thereafter pre-tested and all identified errors were addressed before the questionnaire was developed for field administration.

Method of Data Collection

The data for this study were collected through questionnaire. It was used to gather information from the respondents on public knowledge of malaria epidemiology and their participation in malaria prevention and control in Osokom Boki of one hundred (100) respondents in the area.

Method of Data Analysis

The data collected were organized and put in tabulated form based on the research questions to guide the study. These were further analysed using Person Moment Correlation statistics

RESULTS AND ANALYSIS

Hypothesis one

H₀₁: There is no significant relationship between residents' knowledge of malaria transmission and their participation in malaria prevention and control activities in Osokom Boki Local Government Area?

Table 1

Pearson correlation co-efficient analysis in relation of residents' knowledge of malaria transmission and their participation in malaria prevention and control activities in Osokom Boki Local Government Area.

(N = 100)

VARIABLES	X	SD	r- calculated value
Residents' knowledge of malaria transmission	5.617	2.433	.459
Participation in malaria control activities	4.189	1.839	

***significant at .05 level, df = 98, critical value = .195**

Result from table 1 above reveals that the Pearson product moment coefficient analysis of the relationship between residents' knowledge of malaria transmission and their participation in malaria prevention and control activities in Osokom Boki Local Government Area yielded calculated-r of .459, nevertheless a weak positive correlation, which was significant at .05 level; hence, there is a significant relationship between residents' knowledge of malaria transmission and their participation in malaria prevention and control activities in Osokom Boki Local Government Area.

CONCLUSION

In conclusion Malaria is one of the major causes of mortality and morbidity in tropical and sub-tropical nations like Nigeria. Malaria is basically transmitted from one person to another by female *Anopheles* mosquito that carries the parasite, *Plasmodium*. At present, Nigeria is one of the main countries with high prevalence rate of Malaria in the world, as such its endemic in the area. Over 95% of Nigerian population is at risk to malaria infection especially in the rural area. From the study it is evident that residents' knowledge of malaria transmission and their participation in malaria prevention and control activities, people's knowledge of water bearing plants, public awareness of stagnant water all act as a factor of malaria spread and their participation in malaria prevention and control in Osokom Boki Local Government Area, there

is a significant relationship between a public knowledge of solid waste as a factor of malaria spread and their participation in malaria prevention and control in Osokom Boki Local Government Area. In view of the above, it is pertinent that the Government and other agencies should educate the masses on the importance of malaria prevention and control methods/techniques and to teach them and how to properly use it with the help of the media, for better health of tomorrow.

Recommendations

Based on the findings, the following recommendations were made.

1. Residents' knowledge of malaria transmission and their participation in malaria prevention and control activities needs to be improved by means of awareness creation.
2. The Government and other health agencies should educate the masses on the importance of malaria prevention and control methods/techniques and to teach them and how to properly use it with the help of the media, for better health of tomorrow.
3. Awareness programs should be initiated to convalesce People's knowledge of water bearing plants as a factor that promote the spread of malaria and their participation in malaria prevention and control activities

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