

**HEALTH SEEKING BEHAVIOUR IN MALARIA TREATMENT BY
THE FISHING COMMUNITY OF RUSINGA ISLAND, WESTERN
KENYA**

BY

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DECLARATION

This thesis is my original work and has not been presented for a degree in any other University

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Date

This thesis has been submitted for examination with my approval as University Supervisor

Prof. Charles Nzioka

Date

Dr. Edward Ontita

Date

DEDICATION

I dedicate this work to all communities in the rural parts of the World suffering from poverty and struggling with any kind of disease.

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ABSTRACT

Literature on health and diseases indicate that people perceive diseases variously. People develop their own views and beliefs about the causes, symptoms, modes of transmission and therapy choices, which then influence their health seeking behaviour. The main objective of this study was to explore health seeking behaviour in relation to malaria among the fishermen on Rusinga Island on Lake Victoria Kenya. This study which focused on the fishermen on Rusinga Island on Lake Victoria Kenya sought to establish the behavioural practices that are thought to predispose fishermen to malaria, the social cultural factors influencing their choices of therapy and the factors that hinder malaria prevention on this fisher folk.

Quantitative data were obtained using a questionnaire from a sample of 600 randomly selected fishermen. Focus group discussion guide and key informants guide were used to collect supplementary qualitative data. Data collected was analyzed using statistical package for social scientists (SPSS) version 20. The key finding of the study was that: 94% of fishermen on Rusinga Island were aware that malaria was caused by mosquitoes but despite this, there is still a lot of ignorance and misconceptions about its causes and methods of prevention. These misconceptions have adversely influenced their health-seeking behaviour which led to delayed action and wrong therapy choices. Apart from misconceptions of the disease, other factors that hinder proper management of malaria include; lack of funds to buy malaria drugs, inaccessibility to treated mosquito bed nets, misuse of bed nets, poor infrastructure, lack of drug adherence, lack of knowledge and ignorance impacted negatively on malaria control.

Despite this, over 73% of fishermen on Rusinga Island were aware of malaria and its consequences. Main sources of information on malaria were media (47%), friends (38%) and relatives (15%). It was however, not possible to establish the quality of information the respondent had on malaria. In order to manage and control malaria on Rusinga Island, this study gives programmatic recommendation that; the government (Kenya) encourages more interdisciplinary collaboration between socio-behavioural scientists, education specialists and entomologists to design evidence-based and culturally sensitive interventions that can help in management and control of malaria. This study also gives a policy recommendation that; the government needs to initiates community-based malaria control programmes that will encourage and enable community engagement in participatory learning and involvement in programme implementation and the government needs to supply and distribute free mosquito repellent jelly alongside bed nets to households in malaria endemic areas (such as Rusinga Island) since it can easily be applied by fishermen even when they are away from home at dusk and dawn. These measures will ensure that malaria is both managed and controlled among the fisher folk.

CHAPTER ONE: INTRODUCTION

1.1 Background

Malaria is a deadly disease that threatens lives of majority of people in sub Saharan Africa. The problem of malaria is associated to human activities as well as changes in the environment. The problem of malaria is made worse by lack of knowledge, poor living standards and several socio-economic challenges. In the context of more concerted efforts to achieve the Millennium Development Goals (MDGs) for malaria reduction, virtually every household in rural Africa where malaria is endemic need to sleep under insecticide-treated nets (Sachs, 2005). To overcome financial challenges and thus to ‘step up’ the spatial coverage of bed nets, highly subsidized or free distribution of bed nets particularly for poor rural populations in sub-Saharan Africa is necessary (Dunn et al, 2011).

Magnitude of Malaria in the Globe

Malaria is the fifth cause of death from infectious diseases worldwide (after respiratory infections, HIV/AIDS, diarrheal diseases, and tuberculosis) and the second in Africa, after HIV/AIDS. According to the World Malaria Report 2011, malaria is prevalent in 106 countries of the tropical and semi-tropical World (Africa; Amazon, Central and Southern America; Central, South and SE Asia; Pacific) that are home to more than half of the world’s people. In most of these areas malaria is a perennial problem. The estimates of malaria burden vary; every year, malaria is reported to cause more than 250-660 million infections and more than a million deaths (mostly among Africa children). The goals set by the World Health Assembly and the Roll Back Malaria (RBM)

Partnership to reduce the numbers of malaria cases and deaths recorded in 2000 by 50% or more by the end of 2010 and by 75% or more by 2015 have not been achieved yet. Instead, over the past 35 years, the incidence of malaria has increased 2-3-fold and this continuing upsurge has come from several factors like the weakening of public health systems in some poor countries, continuing poverty and political instability, drug-resistant parasites, insecticide-resistant mosquitoes, global climate change, population movements into malarious regions, changing agricultural practices including the building of dams and irrigation schemes, deforestation etc. In most areas, malaria and poverty co-exist with the average GDP and average growth of per capita GDP in malarious countries being about one fifth of those in non-malarious countries. More than 3000 cases of malaria are reported annually among travelers from developed world visiting malarious areas. With the shrinking globe, perennially prevalent malaria, therefore, remains an ever existing danger for humanity, in every part of the globe (WHO, 2011).

Malaria in Africa

The vast majority of malaria deaths occur in Africa, South of the Sahara, where malaria also presents obstacles to social and economic development. Malaria has been estimated to cost Africa more than US \$ 12 billion every year in lost GDP, even though it could be controlled for a fraction of that sum. There are at least 300 million acute cases of malaria each year resulting in more than a million deaths. Around 90% of these deaths occur in Africa, mostly in young children. Malaria is Africa's leading cause of under-five mortality (20%) and constitutes 10% of the continent's overall disease burden. It accounts for 40% of public health expenditure, 30-50% of inpatients admission and up to

50% of outpatient visits in areas with high malaria transmission (Sattler et al. (2005). In Africa today, malaria is understood to be both a disease of poverty and a cause of poverty. Poor people in rural areas bear a greater burden of the disease due to lack of access to prompt treatment. Malaria risk is also increasing with the daily growth of city populations that are engaging in irrigated traditional suburban agriculture. Further studies have shown that there is a slow adaptability of anopheline species to existing polluted water in urban habitats (Sattler et al. (2005). Annual economic growth in countries with high malaria transmission has historically been lower than in countries with malaria. Not only does malaria result in lost life and lost productivity due to illness and premature death, but malaria also hampers children's schooling and social development through both absenteeism and permanent neurological and other damage associated with severe episodes of the disease (Murphy & Breman, 2001).

In spite of efforts being made to control malaria in Africa, it is evident that malaria risk behaviours in relation to bed net use are more deeply rooted in socio-cultural beliefs and practices and particularly, in aspects of local livelihood needs. It is also true that livelihoods and socio-cultural beliefs and practices are interwoven with the use and non-use of bed nets. Malaria hampers socioeconomic development by interfering with savings and investment, lowering workers' productivity, promoting students absenteeism from school, causing premature mortality, increasing medical costs (Sachs & Malaney, 2002) and reducing cognitive ability (Kihara et al. (2006). These factors make malaria endemic countries poor and associate them with lower rates of economic growth (Sachs & Malaney, 2002). The global per-capita gross domestic product (GDP) shows a distinct

correlation between malaria and poverty. The reverse is true for countries where malaria has been eradicated (Gallup & Sachs, 2001).

Malaria in Kenya

According to National Guidelines for the Diagnosis, Treatment and Prevention of Malaria in Kenya (2010), malaria is one of the leading causes of morbidity and mortality in Kenya and it kills an estimated 34,000 children under five in Kenya every year. Up to 77% of Kenya's population lives in areas where the disease is transmitted. The disease is responsible for 30% of out-patient visits (requiring more than eight million out-patient treatments at health facilities each year) and 85% of all hospital admissions (National Guidelines for the Diagnosis, Treatment and Prevention of Malaria in Kenya, 2010). About 3.5 million children are at risk of infection and developing severe malaria. Pregnant women also face high risks. There are approximately 1.1 million pregnancies per year in malaria endemic areas. Each year an estimated 6,000 pregnant women suffer from malaria associated anemia, and 4,000 are born with low birth weight as a result of maternal anemia. Economically, it is estimated that 170 million working days in Kenya are lost each year because of malaria illness (National Guidelines for the Diagnosis, Treatment and Prevention of Malaria, 2010).

1.2 Statement of the research problem

According to Opiyo et al. (2007), malaria cases are still high (50%) on Rusinga Island in spite of efforts by the Government of Kenya through the Ministry of Public Health to ensure that insecticide treated bed nets are distributed freely to all households in malaria endemic areas. Fishing livelihood exposes fishermen to a high risk of malaria due to the

many mosquito breeding sites around them as a result of the activities they are engaged in for their survival and also due to spending a lot of time outside (in the lake). This therefore implies that there might be a gap between the availability of health facility services and access to utilization of these services. Several studies have shown that people have their own views and beliefs about the causes and symptoms of malaria, which probably determine the action to be taken in the event of illness. Past studies have concentrated on clinical aspects of malaria but this study considered the social aspects attributed to malaria disease. Since Fishermen are very vulnerable to malaria and the fact that little is known regarding the extent to which social and cultural factors influence their health seeking behavior, their knowledge of causes of malaria and their perceptions of malaria disease as well as where they sought treatment when they were infected with malaria. In view of the above explanations therefore, it was imperative that this study unearths factors which contributed to malaria cases among fishermen on Rusinga Island in spite of them (fishermen) having knowledge of the disease. This study also investigated if health decisions were influenced by factors such as economic status, level of education, perceptions of the seriousness of the condition, accessibility of health care facility, cost of the services and treatment given.

1.3 Research questions

- i) What perceptions of malaria causes and transmission are held by fishermen?
- ii) What social practices associated with fishing predispose fishermen to malaria?
- iii) What factors influence therapy choices among fishermen on Rusinga Island?
- iv) What factors hinder malaria prevention among fishermen?

1.4 Project Objectives

1.4.1 General Objective

The main objective of the study was to establish fishermen knowledge about malaria and how that affected their health seeking behaviour and compliance to therapy.

1.4.2 Specific Objectives

- i) To establish perceptions about malaria causes and transmission among fishermen.
- ii) To determine the social practices associated with fishing that predispose fishermen to malaria.
- iii) To examine factors that influence therapy choices among fishermen on Rusinga Island.
- iv) To investigate factors which hindered malaria prevention among fishermen.

1.5 Justification of the research

The infection of malaria is a cause of concern for the health and well being of the large numbers of people in Sub-Saharan Africa including fishermen. With more people from communities that engage in fishing falling sick and dying of malaria, Kenya requires studies which are aimed at establishing fishermen's access to health care and in formulating appropriate policies and programmes to improve access to malaria health care by fishermen. Fishermen use different means to treat themselves and therefore have a wide variety of therapeutic options to choose from. The fishermen administer different types of malaria treatment based on their perceptions of illness and the cost of treatment.

An investigation of why fishermen prefer certain treatment over others should provide information for policy formulation and provision of health programs that are sensitive and meet their health needs. Since malaria is a problem in many parts of Kenya especially in areas around Lake Victoria, high malaria morbidity means that a lot of money would be channeled to curative services rather than preventive services. In order to maximize use of resources allocated for malaria health care programmes and ensure they are relevant, practical and cost effective; policies with clear objectives and goals need to be formulated based on empirical evidence. In general terms, this research was meant to add new knowledge to the available literature on health seeking behaviour and compliance to treatment.

1.6 Scope of the study

This study on health seeking behaviour in relation to malaria illness was conducted on Rusinga Island in Western Kenya. The main focus was on fishermen on the Island. First and foremost the study established perceptions of malaria causes and transmission by fishermen, determined the social practices associated with fishing that predispose fishermen to malaria, examined factors that influence therapy choices among fishermen on Rusinga Island and investigated hindrances encountered in malaria prevention by fishermen.

1.7 Definition of key terms

Malaria

Malaria is the most important tropical disease, remaining widespread throughout the tropics, but also occurring in many temperate regions. Malaria is a life-threatening parasitic disease transmitted by mosquitoes. It was once thought that the disease came from fetid marshes, hence the name mal aria, (bad air). In 1880, scientists discovered the real cause of malaria a one-cell parasite called *plasmodium*. Later they discovered that the parasite is transmitted from person to person through the bite of a female Anopheles mosquito, which requires blood to nurture her eggs. Today approximately 40% of the world's population mostly those living in the world's poorest countries are at risk of malaria. Today malaria is found throughout the tropical and sub-tropical regions of the world and causes more than 300 million acute illnesses and at least one million deaths annually. Ninety percent of deaths due to malaria occur in Africa South of the Sahara mostly among young children. Pregnant women and their unborn children are also particularly vulnerable to malaria, which is a major cause of perinatal mortality, low birth weight and maternal anaemia. Typically, malaria produces fever, headache, vomiting and other flu-like symptoms (Murphy and Breman, 2001). Many infectious diseases (such as malaria, Japanese encephalitis and schistosomiasis) caused by contamination from fluoride (Gikunju et al, 2002) have known links to the anthropogenic ecosystem, or human land-use activities. Fragmentation of forest habitats for agriculture and settlements leads to effects that promote interactions among pathogens, vectors and hosts (Glass et al, 1995).

Livelihood

Livelihood simply refers to socio-economic activities that people engage in for survival.

In other words, it is means of support to an individual (Dunn et al, 2011).

Fishing

Fishing is a common activity which pertains on getting fish from certain bodies of water. Fishing can be done either on aquatic or marine bodies of water like the ocean/sea, rivers, lakes and a lot more.

Health seeking behaviour

This refers to what people do in case of ill health; this includes time they take from when they exhibit symptoms to visiting a health care facility and the kind of health care provider they choose.

Illness

Illness is defined as a state of ill health resulting from disease of body or mind. It is also an impairment of normal physiological function affecting part or all of an organism.

CHAPTER TWO: LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.0 Literature Review

This Chapter presents a review of the literature and theoretical frameworks. The Literature review in this study focused on the following thematic issues: Malaria transmission, Children and malaria, Malaria in pregnancy, Poverty, health and education, health and culture, Malaria and fishing, Malaria control measures and methods of prevention, and environmental management for mosquito control.

2.1 Malaria Transmission

Malaria causes more than a million deaths each year worldwide. 90% of the deaths are in sub-Saharan Africa, predominantly in children under 5 years old. Malaria is a major cause of poverty and slows down economic growth by up to 1.3% per year in endemic countries. The degree of malaria immunity acquired by individuals living in endemic areas depends on the stable transmission of malaria; the incidence of clinical malaria peaks between 1 and 5 years of age then declines rapidly as effective immune responses develop. Where malaria transmission is less intense, the peak age is later in childhood; and in low-transmission or epidemic-prone regions, vulnerability to infection remains constant across all ages because protective immunity is never acquired. Immunity is not long-lasting and is lost in the absence of repeated exposure to infections. Non-immune individuals such as travelers, aid workers, or displaced populations who move into malarious areas are very vulnerable to death from malaria at any age (Bates et al, 2004).

2.2 Children and Malaria

Malaria accounts for one in five of all childhood deaths in Africa. Anaemia, low birth weight, epileptic convulsions and neurological problems, all frequent consequences of malaria, comprise the health and development of millions of children throughout the tropical world. Yet much of the impact of malaria on the world's children could be prevented with currently available interventions (Murphy & Breman, 2001). In endemic areas the parasite rate increases with age from 0 to 10% during first three months of life to 80 to 90% by one year of age and the rate persists at a high level during early childhood. The mortality is highest during the first two years of life. By school age, a considerable degree of immunity would have developed. In Africa, on average about 1 in 20 children die from malaria, and in worst affected areas, even 1 in 5 or 6 die from malaria and its related diseases (e.g anaemia). More than 50% of deaths from severe childhood illnesses, including malaria, occur within 24h of hospital admission, and early identification and treatment of children at highest risk of death are therefore of great importance. There has been surprisingly little progress towards reducing current mortality rates (15-30%) for children admitted to hospital with severe malaria and other life-threatening infections. Children visiting malaria-endemic countries either as tourists or as returning immigrants from non-endemic countries, are non-immune and at increased risk of malaria. Children should be protected from vectors between dusk and dawn (Crawley et al., 2010).

2.3 Malaria in Pregnancy

Each year, approximately 50 million women living in malaria-endemic countries throughout the world become pregnant, of whom over half live in tropical areas of Africa with intense transmission of *Plasmodium falciparum*. An estimated 10,000 of these women and 200,000 of their infants die as a result of malaria infection during pregnancy, and severe malarial anaemia contributes to more than half of these deaths. Malaria in pregnancy increases the risk of maternal anaemia, still birth, spontaneous abortion, low birth weight and neonatal death (WHO, 2012). In most endemic areas of the world, pregnant women are the main adult risk group of malaria. Malaria during pregnancy has been most widely evaluated in Africa South of Sahara where 90% of the global malaria burden occurs. The symptoms and complications of malaria during pregnancy differ with the intensity of malaria transmission and thus with the level of immunity the pregnant woman has acquired. Despite the toll that malaria exacts on pregnant women and their infants, until recently this was a relatively neglected problem, with less than 5% of pregnant women having access to effective interventions. The promising news is that during the past decade potentially more effective strategies for the prevention and control of malaria in pregnancy have been developed and demonstrated to have a remarkable impact (Murphy & Breman, 2001).

2.4 Socio-economic factors that aggravate Malaria

2.4.1 Poverty

Poverty increases vulnerability to infectious diseases which include malaria, and the ill-health and treatment costs associated with the diseases themselves lead to further

impoverishment. At the regional and national levels, malaria can prevent economic development by adversely affecting savings and productivity. At the community and household level, malaria disproportionately affects lower socioeconomic groups. There is a strong relationship between wealth and treatment-seeking behavior at this level, with children from richer families being likely to seek orthodox medical care and appropriate treatment compared to children from poor families. Poverty also affects the ability to access malaria-prevention services (Bates et al, 2004). According to Sachs (2005), people in society are driven to taking inappropriate actions due to extreme poverty. Sometimes, people are more concerned about their livelihoods than their health status. People in society get more concerned about their survival and will use whatever means that is within their reach in order to achieve their goals. Sachs talks of people in society being pushed into doing what they do because of extreme poverty. To him, extreme poverty means a situation where basic needs cannot be fulfilled. The basic needs he talks about include adequate daily nutritional intake, safe drinking water, basic sanitation, a livelihood that can support survival, which can give a chance for a child to make his or her way through school, access to essential health services in a healthy emergency, a disease spell.

2.4.2 Health and Education

A widespread lack of awareness of the nature and severity of malaria allows the disease to ravage communities not just in sub-Saharan Africa but in most rural communities worldwide. When mothers see their children dying, they don't think of malaria. Some think their children were bewitched so they don't go to the clinic. Instead, they spend a

lot of time taking traditional medicines. Misperceptions concerning the root causes of malaria highlight the failure of education. This knowledge gap has serious implications for the use of Insecticide-treated Nets (ITNs) (Alaii et al, 2003). Misperceptions, such as beliefs that exposure to the sun causes malaria and that convulsions indicate spiritual 'possession', can adversely affect treatment-seeking behavior and increase malaria vulnerability of those with poor understanding of malaria transmission. Health complications like poor immunization, people ailing from preventable diseases, poor hygiene and sanitation and malnutrition are common due to lack of public education of health issues. For health education to be effective, it must not only convey information but also imply action which leads to a change in behavior, attitudes and practices from those that are not conducive especially to health.

The provision of information on appropriate use of antimalarial drugs can influence treatment-seeking behavior. For example, mothers with low educational attainment contribute minimally in reduction of mortality among children under 5 years old in community compared to women with high educational attainment. Women who have been to school have a better chance of understanding the transmission of infectious diseases such as malaria and the methods of prevention as well (Fitzgerald, 2006). Most governments especially in Africa are now concentrating on the theme girl-child education as a strategy for development and reduction of the educational gap between females and males. Education especially high education attainment enhances the status of women through improving their living standards (Fitzgerald, 2006). There is also some evidence that educated parents are more likely to seek formal treatment when their child gets

malaria symptoms, which will reduce the risk of progression to severe disease. Although concern about malaria mortality is often focused on children under 5 years old, older children are also significantly affected by malaria. 15-50% of fevers and absences in school children in endemic countries are due to malaria. Malaria itself therefore contributes to poor educational attainment by causing anaemia and absence from school (Bates et al, 2004).

2.4.3 Health and Culture

Culture is that complex whole which includes knowledge, belief, art, morals, law, customs and any other capabilities and habits acquired by man as a member of society. It provides members of a group with a mirror with which to see the world and define behavior. Therefore health problems are a cultural phenomenon. Culture guides communities on how to view the world, experience it emotionally and how to behave in relation to other people, natural environment and the supernatural forces (Hardon et al, 1995). A cultural background therefore has an important influence on peoples' lives, their beliefs, behavior, emotions, perceptions, attitudes to pain and other forms of misfortune, all of which may have important implications for health and healthcare (Helman, 1990). Knowledge of the causes of Malaria has also a role to play in health seeking behavior. Cultural beliefs about the causes of malaria may influence how people treat their symptoms and from whom they get treatment.

Individual's beliefs, behaviour, perceptions, emotions, attitudes to pain and other forms of misfortune are communicated to others in ways that are culturally prescribed. For

example in one culture, a sick person may not be expected to show his pain, while in others, he or she is expected to do the vice versa (Read, 1996). Health implications are stereotyped and understood in accordance with the prevailing cultural concepts. Whether an illness is seen as serious or harmless varies from one culture to the other (Sindiga 1995). Therefore it is crucial for health care providers to appreciate the large role played by human behaviour and hence culture in the maintenance of health within every community of mankind. Sick people, as cultural beings, have over the years developed social institutions; aetiological theories and therapeutic techniques to enable them to cope with social and other dislocations occasioned by illness induced disability (Helman, 1990). Disease with its pain and suffering is the most predictable of human conditions and is both a biological and cultural universal (Foster and Anderson, 1978). Societies have developed a disease theory and a health care system. On the other hand, the health care system addresses itself to the ways in which societies organize to care for the sick as well as to utilize disease knowledge to aid the patient (Foster and Anderson, 1978). It is clear that cultural beliefs influence health seeking behaviour (Richard et al, 1990). Within any culture, diseases are analyzed in relation to their causes, whether caused by natural or human induced forces (Paul, 1995). The types of treatment choices are greatly influenced by these causes. For instance, the utilization of biomedical services is quite common when the cause of illness is believed to be natural. On the contrary, resort to traditional medicine when disease is caused by human induced forces is prevalent (Paul, 1995). Nevertheless, various studies have revealed that when faced with actual illnesses, patients use a number of systems simultaneously during the same illness period (Nyamwaya, 1992; Sindiga et al, 1995).

2.5 Malaria and Fishing

Some activities related to fishing are carried out between dusk and dawn which is the preferred biting time of anopheles mosquitoes. People involved in these activities are thus exposed to an increased hazard of being infected with malaria. In the case of Omena (*Rastrineobolaargentae*) fishing, the fishermen stay on the open lake for most of the time while the women who buy the Omena (*Rastrineobolaargentae*) from them wait on the shore. There are many breeding sites of anopheles mosquitoes particularly along the lake shore close to beaches; and many of them have anopheles larvae even during the dry season. As a consequence, the female buyers of Omena (*Rastrineobolaargentae*) are exposed to a very high hazard of malaria infection. Also, those involved in pulling the nets at night are exposed to anopheles mosquitoes and malaria. Activities related to fishing are the main source of income generation for most people living around the lakes.

2.6 Malaria control measures and methods of prevention

Malaria control is complex and cannot be achieved by a single intervention (Shiff, 2002). Integrated approaches that incorporate environmental management techniques could increase the chances of controlling the disease (Castro et al., 2004). Adoption of environmental management practices could reduce the need and use of anti-malarial drugs and insecticides, thus delaying and/or reducing the onset of resistance. Measures against malaria can either target the parasites or the vectors. Measures directed against the parasite involve the use of drugs and vaccines while those directed against vectors involve use of insecticides and environmental management. Malaria parasites can be controlled using drugs and vaccines. However, although anti-malarial drugs play an

important role in treating and controlling malaria, their efficiency is undermined by the emergence of drug resistant strains of plasmodium parasites (Ntoumi et al., 2004). Vector directed control strategies mainly rely on indoor residual spraying (IRS) with potent insecticides (Roberts et al., 2000) or insecticide treated bed nets (ITNs) (Lengeler, 2004).

Control measures are used to contain malaria epidemics, prevent death and disability (morbidity and mortality). Measures to control malaria include the following;

1. Early diagnosis and treatment

Making early diagnosis and giving prompt treatment can cure the disease and reduce the spread of drug resistance.

2. Bed nets

This helps in reducing the number of infective bites a person receives and, because of the insecticide in the net, reduce the adult mosquito population.

3. Insecticide spraying

Measures to control the insect vector, reducing the numbers of mosquitoes and hence reducing transmission of the malaria parasite, include insecticide spraying.

The primary protection method used by many people world over is the use of bed nets. According to Atkinson et al., cleanliness is also essential for malaria prevention. Adults and children should wash themselves daily and wear clean clothes, keep one's house and yard clean and tidy (including some source reduction activities such as draining of collected rain water). Atkinson's study also reported that the use of long clothing, a

blanket, mosquito coils and traditional practice of burning coconut husks or green leaves to create smoke for repelling mosquitoes are other methods of protection from malaria. These methods are used particularly by those travelling away from their villages or camping by their gardens as an alternative to the use of bed nets.

Malaria can also be prevented by introducing health education initiatives that attempt to elicit participation in increasing malaria knowledge and by encouraging individuals to take responsibility for their own health (Atkinson et al, 2010). Adherence to malaria prevention practices, such as bed net use, appears to be a complex interaction between risk perception, intervention acceptability, socio-cultural factors and practical issues. Local leaders or community leaders need to be engaged in community mobilization for malaria elimination by encouraging participation by the people at household levels in malaria programmes through relationships between health care workers and the leaders of the affected communities. Through the use of the existing social mechanisms the malaria elimination programme can capitalize on the communities' intimate knowledge of local environmental risk factors for malaria and engage them in regular, coordinated, community-wide prevention measures including source reduction, personal protection and surveillance activities. This will be particularly important in remote communities where access to treatment for malaria is considerably more difficult and whose participation in the programme is vital to achieving and maintaining zero malaria transmission.

2.7 Environmental Management for Mosquito Control

Environmental management in malaria control involves the performance of activities that lead to the modification or elimination of aquatic habitats so as to reduce mosquito breeding. Environmental modification involves any long-lasting or permanent change of land, water or vegetation that is aimed at reducing vector habitat. It involves activities such as filling, drainage and impoundment. Filling of abandoned ditches, burrow pits and pockets of water with soil, stones, refuse or ash eliminates potential mosquito breeding habitats (Lindsay et al., 2004). Filling up potential mosquito breeding habitats with ash has been successfully used to reduce malaria cases in India (Dua et al., 1997). Drainage is the removal of excess or unwanted water from the land surface or below it to eliminate suitable mosquito breeding habitats.

2.8 Theoretical Framework

2.8.1 Health Belief Model (HBM) and its relevance to this Study

People's perceptions disease vulnerability will influence their decision and health seeking behaviour. The Health Belief Model is many at times used in analyzing health related behaviour and hence is relevant to this study. This model formulated by Rosenstock, Hochbanm, Kegels and Leventhal between 1950 and 1960 was purposely meant to explain preventive health behaviour through use of socio-psychological variables. This model brings together factors that influence an individual's judgment of expenses and gains involved in seeking medical attention. It was essential in a choice situation to an individual and about alternative health behaviour. The main elements of Health Belief Model include: health behaviour, illness behaviour and the sick role behaviour (Kasl and

Cobb, 1966). Illness behaviour is defined as “any activity undertaken by a person who feels ill, for the purpose of defining the state of his health and of discovering a suitable remedy”. This model brings together demographic factors and psychological factors that influence one’s judgement of costs and benefits involved in seeking medical help. For example gender and age are some of the demographic factors which influence a need for health care services.

This model enables us to understand different health behaviours exhibited by people who perceive to be ill, sick or healthy. Sick people will tend to behave differently from those who are healthy. Sick people will undertake a patient’s role behaviour whereby they will then engage themselves in such activities as self medication, consult community health workers, visit health facilities and use alternative medicines for the purpose of getting well. This model was useful because it helped in understanding why fishermen behave differently when ill and their perception on health issues. The health belief model was used to explain reasons for use and non-use of health services and to analyze decisions that underlie choices of therapy. The model was used to identify and explain fishermen’s social cultural factors which determined health seeking behaviour. The health belief model is used to explain and predict preventive health behaviour.

This model holds that an individual’s perception is a strong predictor of health behaviour. For instance, if an individual feels that he/she is more susceptible to a disease and that the disease is severe or life threatening then he/she is more likely to seek medical care. Perceived gains of taking appropriate measures also influence health behaviours.

Explanations by this theory are however not practical as it was discovered by the researcher in this study. In some instances, fishermen were unable to seek medication attention in spite of them knowing that they were infected with malaria. This was occasioned by lack of funds to seek medical attention, long distances to and from health facilities. It is therefore not automatic that fishermen will seek medical attention once they experience severe symptoms. Therefore, for fishermen to define their illness as Malaria and go for treatment or participate in its prevention, an individual needs to know malaria as a disease, its causes, its seriousness and steps to be taken towards its treatment and prevention. Malaria control measures, including treatment and prevention can yield positive results only when the fishermen know about the disease, how it is treated, and preventive measures to undertake and perceive malaria as a threat to their lives.

2.8.2 Rational Choice Theory and its relevance to this Study

According to Coleman (1990), rational choice theory is also known as choice theory or rational theory. Rationality is widely used as an assumption of individuals' behavior in microeconomic models and analysis. It involves seeking the most cost-effective means to achieve a specific goal without reflecting on the worthiness of that goal. Coleman further explains that human beings are calculative in nature and therefore try to make rational options depending on the circumstances they find themselves in. This theory was relevant in this study because fishermen were likely to rationally choose from varied health therapy choices available to them when they were infected with malaria. This depended on what the fishermen considered to be the most cost-effective means to achieve their goal (getting healed).

Rationality by people varies because they are different and so are decisions they make. The weakness of this theory is that it allows people to make their own choices thus leaving room for unreasonable and unrealistic outcomes since rationality is relative to different people (what is rational to one person could be irrational to another person).

2.8.3 Symbolic Interactionism Theory and its relevance to this Study

Symbolic interactionism theory by Charles Horton Cooley and George Herbert Mead (1998), posits that people inhabit a world that is in large part socially constructed. The symbolic interactionism perspective is based on how humans develop a complex set of symbols to give meaning to the world. These theorists argue that it is through interaction that humans develop a concept of larger social structures. People in society have different perceptions as to what gives meaning to what they believe in. Fishermen for instance hold several beliefs as to what causes malaria as well as what the symptoms of malaria are. Fishermen are also likely to settle for certain health therapies when infected by malaria based on what they heard from others when interacting, for example, what remedial measures that others took in malaria illness. In view of the aforesaid explanations, there is a likelihood of varied health seeking behavior among fishermen making symbolic interactionism theory relevant to this study. However, not all people attach the same symbol to something. This therefore renders this theory to appear construction in itself and causes a challenge in its use.

Figure 1: Conceptual model of malaria health seeking behaviour

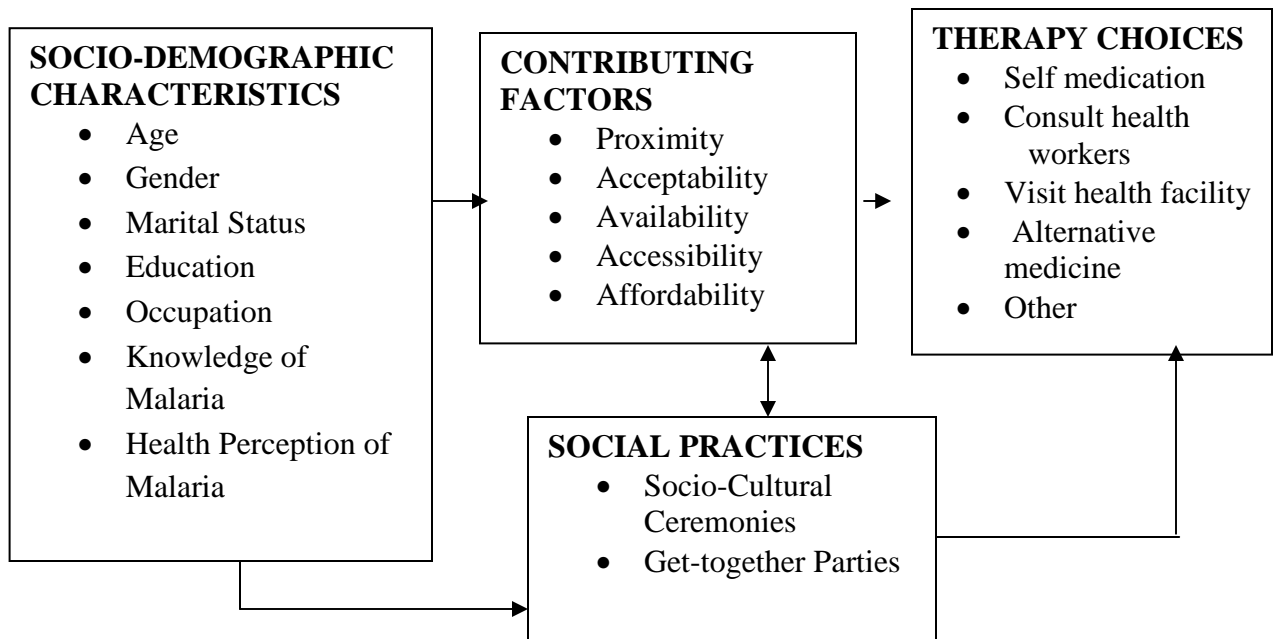


Figure 1 summarizes the conceptual framework on which this study is based. Factors associated with individual include the presence of disease, socio-demographic characteristics and social practices. This model also elaborates how various factors interrelate with one another to determine health care choices made by an individual in Malaria illness. Factors influencing therapy choices such as proximity, acceptability, availability, accessibility and affordability interact with various socio-demographic factors. The socio-demographic characteristics include age, gender, marital status, education and occupation. A review of the literature noted a positive association between education and seeking treatment. These essentially determine health care choices (self medication, consultation of community health workers, and utilization of formal health facilities or use of alternative/traditional medicine). Health seeking behaviour could be treatment at home by the individual, other family members or friends or it could be attending a formal

health care facility. The health outcome will be negative if patients do not comply and adhere to malaria treatment. The various factors that hinder adherence and compliance include: high cost of drugs, long distance to formal health facilities, lack of funds for better health care, high transport costs to hospitals, bitter taste of drugs and drug resistance.

2.9 Study Variables

Singleton et al, (1998) points out that variables are characteristics of units that vary, take different values, categories or attributes for different observations and that there are independent variables as well as dependent variables. According to Singleton, independent variable is the presumed cause and the dependent variable is the presumed effect.

2.9.1 Independent Variables

Socio-demographic characteristics: This include occupation, age in years at last birthday, marital status and education which is measured by the number of years spent in acquiring formal knowledge in an educational institution such as school or college.

Knowledge: This refers to one's awareness or conception of causes and symptoms as well as risk of delayed treatment and non-adherence to therapy. Those who subscribe to scientific explanations are considered knowledgeable while those who subscribe to other forms of explanations are considered least knowledgeable.

Social Cultural Factors: These are beliefs, perceptions and assumptions, cultural norms and values which influence the access of Malaria health care services by fishermen on Rusinga Island.

2.9.2 Dependent Variables

Health Seeking Behaviour: This refers to what the fishermen do in case of ill health; it includes time or duration they take from the onset of symptoms and visit to formal health care facility, and also the kind of health care provider they choose.

CHAPTER THREE: RESEARCH METHODOLOGY

3.0 Methodology

This chapter provides the methodology that the researcher used to collect, analyze and present data. This chapter covers: physical description of study area, unit of analysis, study sample, sample selection criteria, data collection tools and ethical considerations.

3.1 Physical description

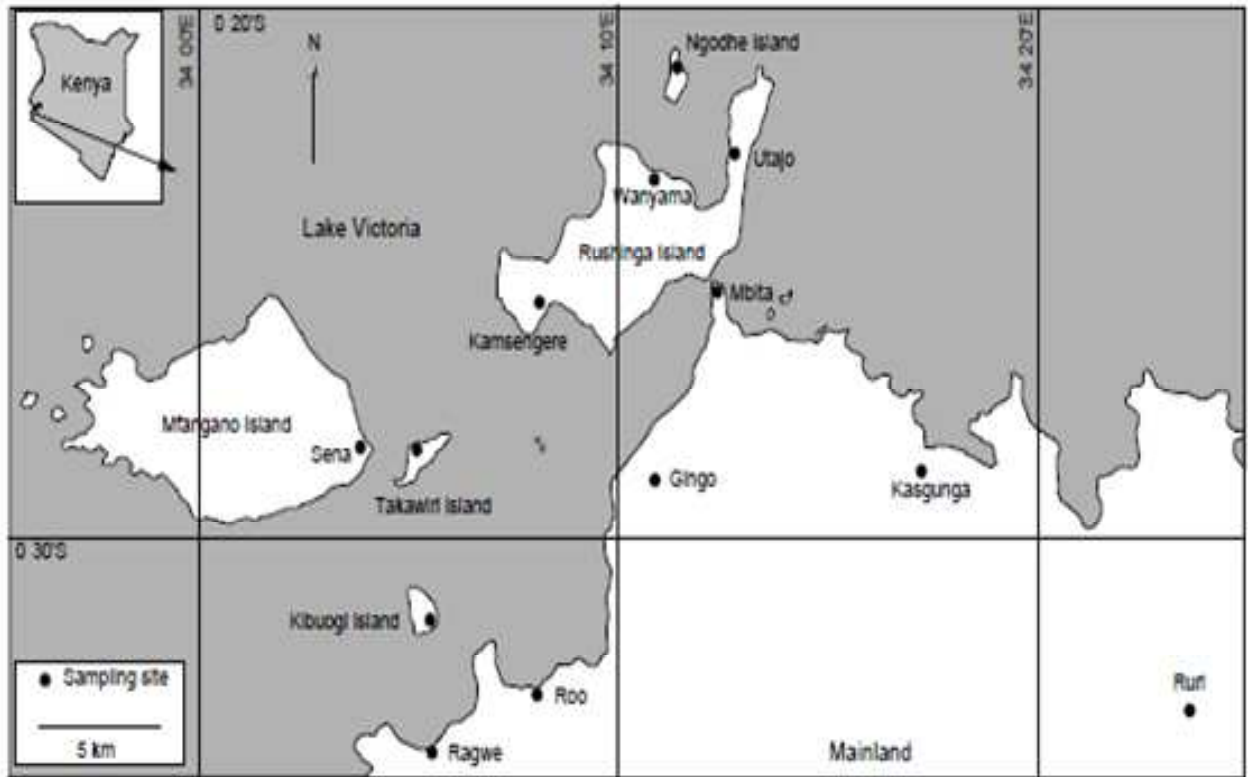
Rusinga Island in Suba District (0° 35- 0°44 S; 34° 11-34°22 E; altitude 1,100m) is 42 km² in area and is the second largest island in Lake Victoria. Rusinga Island has an estimated population of 30,000 inhabitants which form 6,000 households and 23% of the population are children below the age of five. Two government health centres serve Rusinga's population, one in the north - eastern part of the Island and one in Mbita township. Additionally, there are three registered and many unregistered private facilities on the Island. The terrain is extensively deforested and generally rocky and hilly with limited vegetation cover. Two rainy seasons are typical for the area, the "long rains" between March and June and the "short rains" between October and November, but the seasons are unreliable with some years characterized by prolonged dry periods. The Island has suffered enormous environmental degradation, soil erosion and extended drought conditions in recent years leaving little productive land and few opportunities to make money other than through fishing. Furthermore, construction activities, deforestation, vegetation clearance and poorly planned infrastructure development has led to an increased abundance of mosquito larval habitats, notably those suitable for malaria-transmitting *anopheles*. The high prevalence of both malaria (50%) and HIV/AIDS (30%)

on the Island has been a major impediment to socio-economic development (Opiyo et al., 2007).



Map 1. Map of Kenya showing location of Study Area

Source : Chen et al 2004



Map 2. Location of Rusinga Island in Lake Victoria

(Source: Chen et al 2004 – *Population genetic structure of Anopheles gambiae mosquitoes on Lake Victoria Islands, West Kenya*)

3.1.1 Demographic Profile

Rusinga Island with an elongated shape approximately (16km) from end to end and 3 miles (5km) at its widest point lies in the eastern part of Lake Victoria at the mouth of the Winam Gulf (part of Kenya) and is linked to Mbita Point on the mainland by a causeway. Rusinga Island population is estimated to be 30,000 inhabitants (KNDS, 2010). The local language is Luo, although the ancestors of the current inhabitants were Suba people who came in boats several hundred years ago from Uganda as refugees from a dynastic war.

3.1.2 Social Economic Profile

Rusinga Island residents are considered to be fishermen. There is little productive land or few opportunities of making money other than through fishing due to enormous environmental degradation, soil erosion and extended drought conditions.

3.1.3 Health Services

Rusinga Island has two government health centres namely; Tom Mboya health centre and Waware health centre. There are two registered private health facilities like Kolunga health centre and Humanist health centre as well as several other unregistered private health facilities which include Dr. William clinic. There are also several chemists where residents buy prescribed and over the counter drugs.

3.2 Study Design

This study was conducted through Survey. Survey research design is a methodology used to investigate populations by selecting samples to analyze and discover occurrences. This method was used to provide numeric descriptions of some part of the population. It was also used to describe and explain events as they are. The design was selected for this study because of rapid data collection from many subjects within a short period of time and because of ability to understand a population from a part of it.

3.3 Unit of Analysis

According to Babbie (2010), unit of analysis refers to the ‘what’ or ‘whom’ that is being studied. In social science research, typical units of analysis commonly include people, social organizations and social artifacts. The unit of analysis in this study was fishermen.

3.4 Study Sample

Sampling refers to taking a representative section of the population when carrying out research. It is important for the sample to be representative in order for a researcher to make a generalization to the whole population. This study was carried out on Rusinga Island because it is among some of the regions in Kenya with more (50%) malaria cases (Opiyo et al., 2007) in spite of the government’s efforts to control malaria by distributing free treated bed nets to households in all malaria endemic regions.

3.5 Sample selection criteria

Rusinga Island population is estimated to be 30,000 inhabitants (Kenya National Demographic Survey, 2010). Fishing is mainly carried out on the East and West parts of the Island. The sample used in this study was randomly selected from both the East and West of the Island. Random sampling was used to ensure that each member of the target population had an equal chance of being included in the sample and also because it would also ensure that there was representativeness. For the purpose of this study the researcher sampled six (600) fishermen. This is because a sufficiently large sample size is more representative of the population, limiting the influence of outliers or extreme observations. A sufficiently large sample size is also necessary to produce results among

variables that are significantly different. Another reason why the researcher used six (600) hundred fishermen for this study is because a large sample size would minimize standard error and significance was also more likely to be found with a lower standard error. Rusinga East and Rusinga West consist of 6 villages each from where the researcher sampled on either side. The researcher sampled 300 fishermen from Rusinga East and another 300 fishermen from Rusinga West for this study. From the 6 villages on either side, the researcher further sampled 50 fishermen from each village. On arrival at the site, the researcher held 'barazas' in all the villages with the help of area chiefs who prepared a list for her from where the desired number of fishermen was then sampled. The researcher wrote numbers on small pieces of paper (from 1-100), mixed them up and placed them in a basket from where they were randomly picked. The researcher identified all the people who had picked numbers 1-50, arranged to visit their homes and then interviewed them.

3.6 Data collection tools

The following tools were used by the researcher to collect data in this study;

(a) Questionnaire

The researcher administered a standardized questionnaire to 600 fishermen on the Island (300 from East and 300 from West). Use of this tool was aimed at collecting generalizable data on fishermen knowledge about malaria, social-cultural perceptions of malaria symptoms and transmission as well as malaria prevention methods used by fishermen. It was also supposed to unearth factors that hindered malaria prevention

among fishermen. This tool was selected for this study because it would ensure easy collection of a lot of data from many subjects within a short period of time.

(b) Focus Group Discussion Guide

This tool was used to collect qualitative data from the respondents. Data was collected on same issues as those in the questionnaire; that is, fishermen knowledge about malaria, social-cultural perceptions of malaria symptoms and transmission as well as prevention methods by fishermen and factors that hindered malaria prevention among fishermen. The only difference was that these issues were discussed in greater details in FGDs since they allowed debate. The researcher conducted four focus group discussions with different categories of people involved in fishing namely; Boat owners, Traders, Fishing crew and Stakeholders (like boat builders and repairers, net makers and repairers, boat engine mechanics among others). Each focus group consisted of sixteen (16) participants, with eight (8) participants coming from Rusinga East and another eight (8) participants from Rusinga West. In this research, FGDs consisted a maximum of 16 participants than the recommended maximum number of 12 participants because the researcher thought that there were particular people who needed to be included in these meetings who could be able to provide more information on issues/questions that would not be adequately answered in the questionnaire. The other reason for this is in order to avoid sideshows or just one or two people dominating discussions like it tends to happen when the number of participants is small. The researcher's resources were enough to accommodate all the 16 participants and hence there were no challenges encountered as far as management is concerned.

(c) Key Informants Guide

The researcher conducted in-depth interviews with key informants. These are knowledgeable, skilled and experienced professionals within the community. Key informants in this study consisted of medical officers, community health workers, beach management unit (BMU) chairmen and local area chiefs. Here, the researcher purposively sampled at least two (2) informants each from the above groups in the community having a total of at least nine (9) key informants for interview. Information gathered from these key informants was used as additional sources to confirm the data collected from both the Questionnaire and Focus Group Discussions. The advantage of this method was that the interviews enriched data collected through survey.

3.7 Sources of Data

Data in this study came from both Primary and Secondary sources. Primary data was collected through field work, key informants and focus group discussions. Secondary data on the other hand was collected from relevant literature in libraries and from complementary sources such as research abstracts, magazines and journals.

3.8 Data Analysis

Data in this study was categorized and coded thematically using Statistical Package for Social Scientists (SPSS) version 20. The responses were put into categories and themes so as to answer the research questions. The percentage responses for each category were then calculated and used to make statements about the results, identify findings and make conclusions. Cross tabulation and Chi-square was used to test for significant differences

between the variables where necessary. Bivariate and multiple regression methods were also used in analyzing data in this study. Qualitative data were coded around the main thematic topics of the Focus Group Discussions guide and Key Informant interviews. The researcher thereafter subjected the data to thematic analysis, organizing it into identifiable themes and patterns of behaviour.

3.9 Problems Encountered in the Field

Although the process of data collection was successfully conducted, certain problems were apparent. There was a major challenge in the distance that had to be covered to reach various sites. However, some research assistants were employed to assist in collection of data. Time management was yet another hurdle that was encountered in the course of collecting data. Rusinga East and West cover a large area and most households are far apart meaning that a tight time schedule had to be observed to realize the targeted sample size and also some homes had to be visited twice or three times in order to conduct an interview. This was occasioned by the absence of homestead heads at the time the research assistants visited homes and this forced them to go back again. This was indeed a big problem as a lot of time was wasted and only few homes got visited on such a particular day. Another problem was that, about 65% respondents were reluctant or not willing to answer questions if they were not being paid for doing so. Another 52% were also not willing to answer questions with an argument that several researchers had collected information from them in the past but nothing had been done by the necessary authorities to assist them as far as their health was concerned. The research assistants in this study took an initiative to explain to the reluctant respondents that this was a very

serious study and that its findings would be forwarded to the government (of Kenya) so that measures could be put in place to address their health challenges. Only then over 90% of the respondents finally accepted to answer the questions.

There was also a problem of language barrier. Most of the respondents spoke and understood their local language ‘*dholuo*’ only hence communication in the official languages (English and Kiswahili) was not possible. Questionnaires had to be translated into ‘*dholuo*’ and Focus Group Discussions were as well conducted in the local language and then all the notes were translated into English. Despite these problems, the study achieved its goals.

3.10 Ethical Considerations

This study sought the following ethical issues prior to its commencement:-

1. Permission to conduct the study on Rusinga Island was sought from Kenya Medical Research Institute (KEMRI) in Nairobi.
2. Oral consent was obtained from the respondents prior to conducting the interviews.
3. All research participants were provided with verbal and written explanations of the study in English emphasizing confidentiality.
4. Participation in this study was voluntary.

CHAPTER FOUR: DATA PRESENTATION, ANALYSIS, AND INTERPRETATION

4.0 Introduction

This chapter presents a descriptive analysis of the data generated from respondents on Rusinga Island. Attempt has been made in this chapter to provide a general overview of the study findings using descriptive statistics cross tabulation.

4.1 Socio-demographic data of fishermen on Rusinga Island

(a) Age of Respondents

The respondents' age ranged between 15 and 87 years. However, most of those engaged in fishing were below 30 years (36.1%) and between 31 – 40 years (34%). A few of those aged 41 - 50 years (15%) also fished. Only 9.3% of those aged 51-60 years was involved in fishing while 5.1% of those aged 60 years and above got involved. A fair number of those engaged in fishing ranges from 15 to 50 years. This is because those within that age bracket are young and strong and can therefore manage to stay in the lake for longer hours and to pull fishing nets to the shore once a catch has been made unlike the old folk. Notably, there was a significant difference between male and female as far as involvement in fishing was concerned ($\chi^2 = 114.7$, df 2, p = 0.001) as was established by this study. More male were involved in fishing than female.

Table 1. Proportion of respondents

Age	No. of respondents	Percentage (%)
Below 30	216	36
31 – 40	204	34
41 – 50	90	15
51 – 60	58	10
Above 60	32	5
Total	600	100

(b) Marital status

A significant percent (81.5%) of respondents engaged in fishing were married. However, widowed (11.2%), single (7%) and divorced (0.3%) were also involved. The researcher found out that fishermen on Rusinga Island tend to marry as early as 20 years. This was simply because a lot of money was earned through fishing more especially by selling of fish and this also meant that young men did not care much about studying since they got money early enough and this therefore made them feel that they were financially stable to get married.

Table 2. Marital Status of Respondents

Marital Status	n	%
Married	489	81.5
Widowed	67	11.2
Single	42	7.0
Divorced	2	0.3
TOTALS	600	100

(c) Respondents educational level

Education by any standards has been recognized as a basic need in human life and as a direct bearing on other variables like socio-economic status, decision making and employment. In this study, most (70.1%) fishermen on Rusinga Island attained Primary level of education. Of all respondents interviewed, only 25% were educated beyond primary school, 2.0% attained college/university level education while 2.3% had never been to school. There was a significant difference in the educational level between men and women ($\chi^2 = 32.4$, df 4, p = 0.001) with more men educated beyond primary and 5% of women without any formal education as compared to men, 0.6%. The researcher established in this study that due to poverty in households on the Island, very few families could afford to send their children for Secondary education and College/University training.

Table 3. Level of Education of Respondents

Education	No. of respondents	Percentage (%)
Primary	422	70.3
Secondary	152	25.4
Never attended school	14	2.3
College/University	12	2.0
TOTAL	600	100

4.2 Source of Livelihood

The main sources of livelihood for Rusinga Island fishermen are fishing (82%) and fish trade (18%). Fish trade entailed buying and selling of fish and traders were mostly

involved in trade of Nile Perch (*Lates Niloticus*), Nile Tilapia (*Oreochromis Niloticus*) and Omena (*Ratrineobola Argentae*). Different categories of traders were also involved in fish trade. There was 10% of traders who bought and sold fish to others immediately at the lake shore (middlemen or 'chumbu' in local dholuo language) and they traded in Nile Tilapia only. Another category (5%) was that of traders who sold fish that was given to them as a form of payment by their employers (known as 'ochoro' in dholuo) and they sold the three main fish species namely; Nile Perch, Nile Tilapia and Omena. There was a group of traders 3% (30) who sold fish to truck owners and consumers outside beaches who would then transport the fish to other parts of the country especially Mumias and Nairobi. The gender that mostly dealt in fish trade was female 58% (348). It is however important to note that the fishermen were also engaged in other economic activities apart from fishing. These activities included; fish preservation 2% (12), transportation 5% (30), boat building and repair 2% (12) and net repair 1% (6).

Fish preservation is an economic activity which entailed cleaning and smoking of fish and was carried out by 46% (276) of female. Transportation as an economic activity involved the transportation of fish from the lake shore or beaches to the market where various modes of transportation were employed and they included; use of motorcycles 21% (126), bicycles 9% (54), engine boats 13% (78) and human labour 46% (276) (women carried fish on their heads) to the market.

4.3 Social Practices associated with fishing that predispose fishermen to Malaria

4.3.1 *Fish bait mines*

Common use of earthworms as fish baits on Rusinga Island has evolved into a small scale business. The earthworms are normally extracted from wet soil by digging holes using hands by 73% (438) of traders and the harvested worms are subsequently sold as fish baits to fishermen. The open excavated pits that are left behind after obtaining the worms hold water that support mosquito breeding, so exposing locals to an increased risk of bites from malaria mosquitoes at dusk and dawn as their houses are located close by.

4.3.2 *Housing and settlements*

Houses of fishermen were makeshift (known as *Abila* in local dholuo language) in nature and typically located along the shoreline of Lake Victoria on Rusinga Island. The houses were poorly constructed and largely unfinished. Living in poor houses in close proximity to the shoreline by 60% (360) of fishermen exposed them to a high risk of contracting malaria. These houses were also highly porous to entry of malaria mosquitoes. These houses were normally shared by large numbers of fishermen in shifts, often had no steadfast rental or owner occupier status and therefore hardly contained beds and beddings. The occupiers slept on the floor on ‘manila paper’ (a heavy translucent polythene paper) on which fish was placed once it was out of water. Sleepers were thus exposed to even higher mosquito bites because the houses hardly contained insecticide treated nets (ITNs).

4.3.3 Boats not in use

Abandoned and boats not in use held water that could be used for mosquito breeding. For example boats used for Omena (*Rastrineobola argentea*) were normally not in use during the months of March to July (i.e. the fish breeding period) because there was a ban by the Kenyan government on the fishing of omena (*Rastrineobola argentea*) during that period. The filling of boats not in use with water was a common practice among 65% of fishermen on Rusinga Island. This practice was perceived by the fishermen to help keep the boats in functional order by making the wooden structure not to shrink and crack when kept outside water. Therefore fishermen always put water in the boats as a form of maintenance exercise. This water supported breeding of malaria transmitting mosquitoes which then bit the fishermen since the boats were located in close proximity to their houses.

4.3.4 Misuse of mosquito nets

The use of mosquito nets for fencing vegetable gardens, fishing/fish drying and covering fish ponds (to keep away kingfishers and other fish predators) by 62% (372) of fishermen on Rusinga Island diverted the insecticide treated nets (ITNs) from their rightful use. Fish drying especially of omena (*Rastrineobola argentea*) was practiced by 45% of fishermen near the shores, constituting the bulk of breeding sites on Rusinga Island. As the fish dried, scales peeled off and were blown away by wind to nearby waters, including pools formed along the lake shores. The scales formed good food for mosquitoes present in the pools. The ponds (55%) constructed for fish farming also

constituted a reservoir for mosquito breeding during the dry season and this increased the risk of malaria infection by fishermen.

4.3.5 Night Life

There were several social activities that took place on Rusinga Island at night when malaria mosquitoes were active. They include the following; get-together parties 5% (30), bumper harvest parties 7% (42), beer parties 3% (18), over night prayers/camping 5% (30) watching football matches on big screens in open spaces 4% (24) night preps (children learn and sleep in classrooms) 2% (12) sporting activities 2% (12) attendance of funerals (night vigil) 7% (42) birth celebrations 2% (12) attending religious camps ('Kiche' and Camporee) 4% (24) and attending discos 15% (90) as shown in table 4 below.

Table 4. Malaria predisposing Activities/Practices/Occupations on Rusinga Island

Activity	Number	Percentage (%)
Get together parties	30	5
Bumper harvest parties	42	7
Beer parties	18	3
Overnight prayers/camping	30	5
Watching football matches on big screens in open spaces	24	4
Night preps	12	2
Sporting activities	12	2
Attendance of funerals	42	7
Birth celebrations	12	2
Attendance of religious camps	24	4
Attendance of discos	90	15
Guarding	138	23
working in bars	126	21
Total	600	100

There were also night jobs that predisposed people to malaria on the Island and they include guarding (night watchmen) 23% (138) and working in bars (bar attendants) 21% (126).

4.4 Malaria Predisposing Occupations on Rusinga Island

There were various occupations that predisposed people to malaria infection on Rusinga Island as was discovered in this study. Out of the 600 respondents who were interviewed, 43% (258) indicated that fishing predisposed more people to malaria, 23% (138) mentioned night guarding as an occupation that exposed people to malaria infection while small scale farming exposed 22% (132) of people to malaria on the Island. Other occupations which were also perceived to predispose people to malaria but on a minimal scale included prostitution, 5.14% (31) and teaching, 1.5% (9). People engaged in the above named occupations were at a higher risk of being infected with malaria because they undertook their duties at the time when malaria transmitting mosquitoes were active, that is, at dusk, dawn and night. It is clear from the above findings that livelihood activities like fishing and farming exposed people more to malaria infection on Rusinga Island. It is therefore inevitable that urgent measures be put in place by the government (of Kenya) to help arrest the situation.

4.5 Reduction of Mosquito Population

The following are among the measures taken by people to reduce mosquitoes in Rusinga community as was mentioned by the interviewed respondents; clearing bushes in the environment 41% (250), draining of stagnant water from the land surface 28% (172) and

filling up abandoned ditches, burrow, pits and pockets of water with soil 33% (198) to eliminate suitable mosquito breeding habitats.

4.6 Fishermen perception on Malaria Causes and Symptoms

4.6.1 Malaria Causes

The researcher asked the respondents what malaria was, its causes as well as its symptoms so as to test their knowledge on this area. Majority 82% (492) of the respondents knew about the disease and said that it was transmitted by mosquitoes. They understood malaria to be a deadly disease that threatened life if not taken serious. Out of the six hundred (600) respondents who were interviewed, 94.5% (567) said that malaria was caused by '*suna*' (mosquitoes). However, 1.7% (10) of the respondents believed that malaria was caused by bad water, 1.5% (9) respondents believed that the disease was caused by unclean environment, 1% (6) believed it was caused by playing in rain.

4.6.2 Malaria Symptoms

The researcher sought to find out views of the respondents regarding the symptoms of malaria. The common symptoms that were mentioned by respondents included the following; fever 24.22%, (145) headache 23.34% (140), joint pains 18.5% (111) and vomiting 17.1% (103). Other symptoms that were also mentioned by 20%(120) of the respondents included Nausea, 6.3% (38), Diarrhea, 2.4% (14), loss of appetite, 2% (12) and '*ndulume*'(convulsions), 3.5% (21).

Table 5. Malaria Symptoms

Symptoms	Number	Percentage (%)
Fever	145	24.22
Headache	140	23.34
Joint pains	111	18.5
Vomiting	103	17.1
Nausea	54	9
Diarrhea	14	2.4
Loss of appetite	14	2.4
Convulsions	35	5.8
Total	600	100

Health seeking behaviour of the respondents was based on their ability to properly diagnose malaria. Most (above 80%, 480) of the respondents were aware of the clinical symptoms of the disease and only about 15% (90) misinterpreted these symptoms. About 24% (144) of respondents reported '*midhusi*' (fever) as the most recognized symptom of malaria by lay people. When a person had '*midhusi man'geny*' (high fever), some pain killers bought over the counter were administered first but if the fever persisted, help was sought from formal health facilities. Headache and vomiting were also reported to be serious symptoms of malaria. In both cases it was reported that if quick action was not taken, patients would succumb to death. According to the findings, the symptoms of malaria that could make a person seek treatment immediately included those that were life threatening, those that made patients uncomfortable and those that made people abandon their daily activities. Up to 70% (420) of respondents reported that when the serious symptoms appeared (such as fever, severe headache and vomiting) action needed to be taken immediately or else death would result. According to respondents serious symptoms needed to appear before any action was taken.

4.7 Those Mostly Affected by Malaria

As far as malaria infection is concerned, some people were most affected than others in fishermen households. Participants in FGDS emphasized that children under age of 5 64% (384), were the ones mostly affected by malaria. This was because they never slept under treated bed nets since their parents could not afford them. In other households where a bed net was available, parents used the net while the children slept without. The explanation for this was that, parents fend for the family and needed not fall sick. In case children fell sick of malaria their parents could take them for treatment unlike if it was vice versa. It was as also established from these FGDs that children above age 5 26% (156) were affected too as well as the elderly 6% (36). Those who were least affected included pregnant women 3% (18) and visitors 1% (6). Children below the age of 5 years got ill with malaria at least once in three months, while those above 5 years got ill once in six months. Pregnant women and the elderly got ill with malaria at least once in a year.

4.8 Medical Treatment

This study established that 46% (276) of the fishermen who were interviewed visited modern health facilities (hospitals) when they were ill with malaria in spite of them being far from their homes; traditional medicine was used by 9% (54) of fishermen; 22% (132) of fishermen used both modern and traditional (mixed) medicine whereas 1% (6) of fishermen sought divine intervention (spiritual healing) when they were ill with malaria. Those who visited hospitals argued that, it was better to be injected as the medicine moved fast in the blood stream and a person felt well quickly than having to swallow

bitter drugs time and again. Depending on who was ill with malaria in the family, the fishermen sought treatment from different places. For example, if it was a child that was sick, he/she would be taken to hospital immediately because malaria was a deadly disease which could kill. Due to low immunity in children, fishermen found it wise to take them to hospital so that they did not die. However, if it was a grown up person that was sick, then over-the-counter drugs could just be used (self medication) 10% (60). Sometimes two or three forms of therapies are used at the same time.

Figure 2 Treatment Pathway

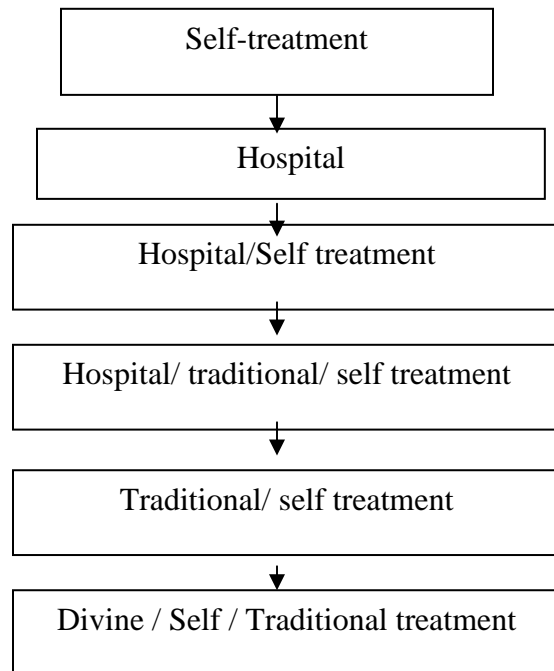


Figure 2 above shows the pathway taken by some fishermen on Rusinga Island depending on the success or failure of the preceding action. As shown, some people choose to treat themselves by use of over-the-counter drugs or go to hospital first when they get sick of malaria. Fishermen who started with self treatment decided to seek help

from hospital once over the counter medication failed. The respondents reported that at other times hospital treatment failed, and whenever that was the case other malaria patients resorted to use of traditional medicine prepared by herbalists. This medicine was perceived to be good by the older generation. If that traditional medicine also failed to help the patients, they turned to God with prayers and sacrifices (2%, 12) expecting healing (a miracle to happen). They followed the treatment pathway so as to bring desired outcome. Those who believed in going to hospital first for tests and treatment before seeking a second opinion were 73% (438). They did not attempt self treatment because they did not know the exact disease or the intensity of the problem, so they would rather enquire from a health care provider. From the ensuing discussion, it can be concluded that Rusinga Island fishermen considered malaria as a dangerous disease which required fast action and proper medication from what they perceived as effective health care provider. It is therefore clear that the fishermen perceived modern medicine to be more powerful and most effective for malaria treatment compared to traditional medicine.

4.9 Distance

The respondents reported that they travelled for long distances in order to access treatment at Government hospitals which were slightly cheaper compared to private clinics. About 65% (390) of the fishermen reported that they covered a distance that lasted them at least 2-4 hours to reach a medical facility with 30% (180) of fishermen covering a distance that lasted more than 5 hours while only 5% (30) of fishermen covered a distance that lasted less than 1hour to reach a medical facility. Due to long

distances between health facilities and fishermen homes, they were left with no choice but to use over-the-counter drugs when they were ill with malaria. This study established that, 25% (150) of fishermen were unlikely to go for ‘proper’ medicine due to long distances covered to hospitals and poor roads. An elderly female respondent aged 52 years said the following on distance in an FGD:

“ Seche moko ok adhi hospital mondo omiya yath kata mondo othiedha ka an kod malaria nikech kuma hospital nitie bor kendo aol ma ok anyal wuotho kendo onge ngato manyalo tera. Seche moko bende aonge pesa mar wuoth madhigo hospital”.

(“At times I do not go to hospital for proper medicine or treatment when I have malaria because the clinic is far and I am too weak to go by myself and I have nobody to take me. On other occasions, I never have money for transport to go to hospital”.) It is therefore clear from the above verbatim that distance had a role to play in health seeking behaviour of fishermen on Rusinga Island.

4.10 Cost of Treatment

Cost of treatment was an important determinant in health seeking behaviour of fishermen on Rusinga Island. Majority 92.3% (552) preferred government health facilities because of their subsidized treatment charges. It was reported by 82% (492) of the interviewed fishermen that they were charged twenty shillings (kshs.20/=) for the card, one hundred shillings (kshs.100/=) for malaria test and forty shillings (kshs.40/=) for malaria drugs (dose). On the contrary, private health facilities treatment charges were twice or thrice those of the government health facilities making services unaffordable to many. The researcher sought to know from the fishermen where they got their money for treatment. Both those who used the government health facilities and private clinics reported that

they were able to pay for treatment themselves with money from their day-to-day livelihood activities. This study established that although the cost of malaria treatment was higher in private health facilities or clinics compared to government facilities (between kshs.350/= - kshs.700/=), 3% (18) of fishermen preferred private clinics. They reported that it was because they were sure of being attended to satisfactorily. There were 6% (36) of fishermen who on the other hand preferred seeking medical treatment from Homa-bay District hospital since it had all the equipments and efficient medical personnel (doctors and nurses) to deal with malaria illness effectively. In conclusion, cost of treatment influenced the fishermen health seeking behaviour. Those who did not afford to pay for health services in private health facilities/clinics chose to visit government health facilities due to subsidized treatment charges.

4.11 Modern versus Traditional Medicine

This study found out that, 22% (132) of Rusinga Island fishermen believed that only one kind of treatment was not effective to fight malaria and another 22% (132) reported that for effective treatment, a combination of both modern and traditional medicine was necessary with 19% of those who first went to hospital reporting that upon completion of malaria drugs, they would embark on local herbs to make sure their immune system remained stronger and to ensure that malaria was fully gone. An illiterate 58 year old male fisherman had this to say on combining both modern and traditional medicine:

“Malaria en tuo maduon’g ma ok wati gi yedhe hospital kende nyaka wamadh yedhe mag kijaluo makata kawasetieko yedhe ma Doktor omiyowa to nyaka wati gi yadh bungu mwangee nituo no orumo chuth”.

(“Malaria is a big disease and we cannot rely on hospital medicine alone, we use our local medicine too, so even after finishing the medicine given by doctors, we take some herbs just to be sure the disease is fully gone”). This shows that some fishermen do not rely on hospital medicine even if they get cured; they still take traditional medicine for “complete” healing. Those who preferred traditional medicine gave their reasons that, it only takes a few weeks for one to be healed unlike hospitals where medication takes long. There were 12% (72) of the interviewed fishermen who associated malaria with witchcraft. When malaria was believed to be caused by sorcery, the fishermen first sought help from a witch doctor (*Ajuoga*). The underlying argument was that even though a person got treatment from a hospital and got cured, a disease caused by sorcery would always come back if the sorcerer was still alive with ‘powers’ intact. The work of those local practitioners (Herbalists) therefore was to ensure that once diseases (including malaria) were treated, they did not come back. This they did by rendering the ‘powers’ of the sorcerer ineffective.

This study also discovered that due to lack of proper knowledge, 22% (132) of fishermen combined both modern and traditional medicine. There was a young male (32 years) fisherman with only primary level of education who gave the following reasons for combining these two medicines:

“Ka ariwo yedhe mag bungu kod yedhe masani ndalo monego amadgie koro tin kendo abedo mangima piyo”.

(“When I combine traditional medicine and modern medicine, the period of taking medicine is reduced and I will recover faster”.)

The emergency of another disease alongside malaria for example tuberculosis posed a challenge in controlling malaria by Rusinga Island fishermen. When faced with a situation where someone suffered from both malaria and tuberculosis, the patient could suspend taking malaria drugs to tackle the ‘new’ disease first, and then resume malaria treatment after he or she had recovered from the ‘new’ disease. This is what was said by a young female (34 years) fish trader:

“Jumbe ariyo mokalo ne an kod tuo mar malaria kod tuo kahera (TB). Ne awayo madho yadh malaria nikech gi kech kendo gimiyo denda beto mool. Koro namadho yadh kahera (TB) mokuongo kae to adokie yadh malaria bange”.

(“Two months ago I was sick with malaria and tuberculosis. I stopped taking malaria drugs since they were too strong and made my body weak. I took tuberculosis drugs first then resumed malaria drugs later”).

4.12 Malaria Prevention

Fishermen on Rusinga Island employed the following methods to prevent themselves as well as their household members from getting malaria; they tried as much as possible to use bed nets 47.37%,(284) dressed in long clothes 5.26% (32), used insecticide spray 21% (126), cleared bushes in and around their homes 5.26% (32), lit fire in houses to keep off mosquitoes 5.26% (32), used mosquito coils 10.53% (63), and sealed all open eaves on their houses 5.26% (32), so that mosquitoes did not gain entry into the house. Up to 8.3% (50) fishermen drained stagnant water in and around their homes and 3% (18) took anti-malaria drugs as well to prevent themselves from getting malaria. This study

also established that 1% (6) fishermen's household members chose to stay indoors at dusk and dawn to avoid exposure to mosquito bites.

4.13 Challenges in Malaria Prevention

Although the people of Rusinga Island had a number of ways of malaria prevention, there were also several challenges they encountered in trying to prevent the disease. The main ones established by this study and also as mentioned by the respondents were; inadequate funds to buy bed nets, drugs and insecticides 46% (276), scarcity/inaccessibility of treated bed nets 10% (60), lack of malaria drugs 6% (36), lack of protective clothing 11% (66), distance from health facilities 5% (30). For instance, control of malaria through use of bed nets was a major challenge among the fishermen as 34% (204) of those interviewed did not use the bed nets for their intended purpose. They used the bed nets to fence off their kitchen gardens to prevent chicken from eating vegetables and to sundry fish instead of sleeping under them to prevent mosquito bites. Another challenge for non use of bed nets by fishermen was that they were away in the lake fishing at the time they were supposed to be under the bed nets. Other challenges mentioned included lack of knowledge by 6% (36), lack of drug adherence 2% (12), high transport costs to health facilities 5% (30), poor infrastructure 3% (18), poor housing 4% (24) and inadequate time to address health issues 7% (42). Over 8% (48) of the interviewed fishermen on Rusinga Island withdrew from taking malaria drugs before recovery once they felt better and assumed that the disease was completely cured and 2% (12) of them claimed that they did not have sufficient knowledge regarding the risks

associated with non compliance to therapy and that there was also no-one to remind them to take their medicine.

In conclusion, fishermen do not comply with malaria treatment. As seen from above findings there are many reasons that influence malaria treatment, adherence and compliance. Following this, it is essential that hospital/clinic attendance by malaria patients be observed and patients counseled against treatment default and use of herbal medicine to treat malaria. Through community health workers, patients need to be encouraged to complete malaria treatment (dose) by monitoring and evaluating them so as to check results of the treatment outcome of a patient.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATION

5.0 Introduction

In this chapter, a summary of what has already been discussed in the previous chapter is given, conclusions are drawn and finally recommendations are made. The main objective of this study was to establish fishermen knowledge about malaria and how that affected their health seeking behaviour and compliance to therapy.

5.1 Summary

According to National Guidelines for their Diagnosis, Treatment and Prevention in Kenya (2010), malaria remains a life threatening and cause of most childhood and adult morbidity and mortality in Kenya. Although 94.5% fishermen know that malaria is transmitted by mosquito bites, there is still a lot of ignorance on how to deal with it (prevention and health seeking behaviors). The first specific objective of this study was to establish perceptions of malaria symptoms and transmission among fishermen. Individuals were found to have varying beliefs and different levels of education with regards to malaria disease. The way the fishermen interpret the symptoms and transmission of a given ill health, influences their health seeking behaviour. To take any action, these fishermen must understand what symptoms they exhibit. Recognition of these symptoms is the entry point of any action. The research reveals that fishermen are able to recognize symptoms of malaria like fever (*midhusi*), headache, vomiting, joint pains and convulsions (*ndulume*). However fishermen consider headache as not so serious and prefer to treat it at home during the initial stage of the ailment. Therefore, the health seeking behaviour of a fisherman with fever and vomiting is not the same as that

of one who just has a headache alone. Whereas headache is considered a “normal” phenomenon, fever and vomiting are taken seriously and usually a quick action is taken since fever and vomiting make patients weak. In other words, fishermen go to health care providers when they see that their life is at risk. Fishermen will also consider the cost of treatment before they decide which therapy to use. This is also driven by perceptions they have about what problem they could be suffering from and its severity. Fishermen try to make decision according to what they perceive rational. Both the Health Belief Model (HBM) and Rational Theory were relevant in this study. This therefore means that the government (of Kenya) needs to initiate programmes where rural communities are educated on the severity of malaria and the importance of seeking medical attention from hospital as soon as they experience malaria symptoms.

The second specific objective of this study was to determine the social practices associated with fishing that predispose fishermen to malaria. The main livelihood activity for most people on the Island is fishing. This study established that more than 70.8% of people on Rusinga Island are fishermen and this therefore means that because of this livelihood activity they are predisposed more to malaria mosquito bites. These fishermen are usually in the lake throughout the day (day and night) and they also dress scantily when carrying out fishing activities. In fact, 96% of the people who are involved in fishing activities on the Island dress scantily (body not entirely covered) and this exposes them to mosquito bites. The fishermen (20.6%) also rested in a makeshift structure called ‘*abila*’ usually located at the lake shore as they wait to go for fishing or after fishing. This structure is not properly constructed (has gaping holes on the walls),

mosquito bed net is not used in it and 88% of these structures on the Island are not mosquito proof leading to high rate of exposure to mosquito bites. Approximately 60% of fishermen have their houses close to the lake and this as well predisposes them to malaria since they are surrounded by water which acts as breeding sites for malaria mosquitoes (*Anopheles gambiae*). Fishermen also engaged themselves in various social functions and ceremonies which exposed them more to malaria mosquitoes. They include; get-together parties (5%), bumper harvest parties (6.5%), beer parties (3%), overnight prayers/camping (1.5%), watching football on big screens at social places until very late in the night (1%), attending funerals away from home where people spend the night outside (7%), birth celebrations (0.2%), children's naming celebrations, wedding parties and celebrations when launching new boats where the ceremonies go on until dawn (8%). In order to control malaria and to minimize mosquito bites from malaria transmitting mosquitoes by the fishermen when going about their day-to-day social activities, the government should supply and distribute free mosquito repellent jelly which can be applied when outdoor.

The third objective was to examine factors that influence therapy choices among fishermen on Rusinga Island. The fishermen have a wide range of therapeutic options. The findings show that malaria patients do not rely on hospital drugs only. They made their choices according to what they found to be rational to them. Majority of fishermen (73%) reported that they visited formal health facilities when they were ill with malaria as the first action to try to restore good health. However, 20% of the fishermen reported self treatment as the first action to restore good health. When this failed, patients engaged in more elaborate therapeutic processes ranging from doctor consultations to

divine intervention. This shows that fishermen do not see modern medicine as the only solution. Fishermen on Rusinga Island believe that if modern medicine does not bring about recovery then it is proper to seek help from local providers who include herbalists. There are various factors that influence therapy choices among fishermen and they include: perceived effectiveness of a given therapy, recognition of symptoms, seriousness of the disease, cost of treatment, distance to health facilities and state of infrastructure. Looking at all the above mentioned factors, Health Belief Model (HBM) was relevant in this study. -Fishermen will go for treatment that works for them and treat symptoms depending on their seriousness. For symptoms which they perceive as simple and normal like headache, they tend to take pain killers such as '*panadol*' or just ignore it. Cultural beliefs also influence the therapy choices of fishermen. The older generation seems to be a little conservative when it comes to malaria since they incorporate traditional medicine in its treatment, while the younger generation is willing to accept change and adopt modern healing process only. The government should initiate community based malaria control programmes that will enable modern communities to understand the dangers of using modern and traditional medical simultaneously.

The fourth and final objective of this study was to investigate factors which hinder malaria prevention among fishermen on Rusinga Island. This research found out that there were a number of challenges that the fishermen faced in trying to prevent malaria and they include the following: inadequate funds to buy bed nets, drugs and insecticides (46%), inaccessibility of treated nets (10%), lack of protective clothing (11%) and distance from health facilities (5%). Lack of knowledge by 6% of fishermen was also a

challenge - due to lack of proper knowledge, some fishermen combined both modern and traditional medicine. There was also a challenge in drug adherence, 8% of fishermen reported that they withdrew taking malaria drugs before recovery once they felt better and assumed that the disease was completely cured. Non use of bed nets by 65% of fishermen was also a big challenge. Fishermen were away in the lake fishing at the time they were supposed to be under bed nets. Misuse of bed nets by 34% of fishermen was yet another challenge faced in as far as malaria prevention was concerned. The fishermen used bed nets for other purposes like in fencing their gardens to prevent chicken from eating vegetables and in sun drying fish (especially omena). High transport costs (5%) to health facilities and poor infrastructure (3%) were as well challenges encountered by fishermen. Rusinga Island has poor roads more especially during the rainy season and this makes it difficult for patients to reach health facilities in good time. Since fishermen are faced with numerous challenges in malaria prevention among them, lack of funds to buy bed nets and drugs, lack of knowledge by some fishermen and poor infrastructure, the government should try and distribute enough treated bed nets and malaria drugs in all public health facilities which should be acquired free of charge. Local communities need to be educated by the government on the dangers of treating malaria using traditional medicine. That can be done through public health meetings in villages, through the media (more especially through radio) and through door-to-door campaigns by community health workers. The government should also ensure that all roads in rural areas are repaired so that they can be passable to enable patients in rural communities to reach hospital for treatment in good time. The government should as well construct more

public hospitals closer to people in rural communities to minimize the distances that patients cover when going to seek medical attention.

5.2 Conclusion

Over 73% (438) of the interviewed fishermen were informed about malaria illness. The information about the disease was acquired from friends 38% (228), relatives 15% (90) and the media 47% (282). Drug adherence was found to be a hindrance to malaria treatment and compliance by 8% (48) of fishermen and 6% (36) of patients was likely to withdraw from medication before recovery even with full instructions from doctors. The researcher found out from this study that the interpretation of malaria symptoms also had an influence on health seeking behaviour of fishermen on Rusinga Island. The fishermen were able to take action to restore their health only after they experienced severe symptoms such as severe headache, fever (*midhusi*) and vomiting. Once an individual experienced these symptoms, then it was interpreted straight away that he or she was infected with malaria and that he or she needed to seek medical attention urgently.

5.3 Recommendations

In order for Rusinga community to be malaria free, this study suggests the following for effective management and control:

- 1.) Government to encourage more interdisciplinary collaboration between socio-behavioural scientists, education specialists and entomologists to design evidence-based and culturally sensitive interventions that can help in management and control of malaria (Research should be carried out on an innovation that can be integrated with use of mosquito bed nets in order to eradicate malaria on Rusinga Island).

- 2.) The Government to initiate community-based malaria control programmes that will encourage and enable the community to engage in participatory learning and involvement in programme implementation (the community needs help to understand the causal connections between mosquito habitats, malaria transmission, malaria symptoms, treatment and prevention). The rural communities also need to be educated on the dangers of using traditional medicine and modern medicine simultaneously.

- 3.) The Government to supply and distribute free mosquito repellent jelly alongside bed nets to households on Rusinga Island since this can easily be used by fishermen even when they are away from home at dusk and at dawn. This measure will ensure that malaria is both managed and controlled among the fisher folk.

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APPENDICES

APPENDIX 1: STUDY QUESTIONNAIRE

HEALTH SEEKING BEHAVIOUR IN MALARIA TREATMENT BY THE FISHING COMMUNITY OF RUSINGA ISLAND, WESTERN KENYA

Questionnaire ID number: Interviewer's name:

Date: _____ Start (time): _____ End (time): _____

Instructions for the interviewer: Please read and follow the instructions provided (see text appearing in italics).

A. PERSONAL DETAILS OF THE RESPONDENT AND GENERAL INFORMATION

Location: _____ District: _____

1. Name: (respondent's) _____

2. Age: (respondent's) _____

3. Sex: 1. Male 2. Female

4. What is your marital status? (*tick what is appropriate for your case*)

1. Single 2. Married 3. Divorced 4. Separated 5. Widow/widower

5. What is your highest level of education? (*tick what is appropriate for your case*)

1. Never attended school 2. Primary school 3. Secondary school

4. College/university 5. Other (*specify*)

6. What is your main source of livelihood?

1. Fishing 2. Fish trade 3. Farming 4. Other

B. MALARIA KNOWLEDGE

7. What is Malaria?

8. In your understanding what causes malaria? (*tick one option only*)

1. Bad water 2. Evil spirits 3. Playing in the rain 4. Flea/tick bites
5. Unclean environment 6. Mosquito bites 7. I don't know
8. Other (specify) _____

9. (a) Have you ever been sick with Malaria?

1. Yes 2. No

(b) If yes, how did you know? (*explain briefly*)

10. What type of treatment did you seek?

1. Visited medical facility 2. Used herbal medicine 3. Visited medical facility and used herbal medicine

11. Who referred you to this type of treatment?

C. FISHING ON RUSINGA ISLAND

12. (a) When do you normally go for fishing?

1. Day 2. Night 3. Both 4. Other
(specify) _____

(b) If night, what light do you use when fishing?

13. Which types of fish do you normally capture? (*rank from most to least captured*)

1. Nile Tilapia 2. Nile Perch 3. Omena 4. Other

14. What method(s) do you use to catch fish?

1. Netting 2. Hooking 3. Trapping 4. Other
(Specify) _____

15. (a) Do you use any baits to catch fish?

1. Yes 2. No

(b) If yes, which of the following do you use?

1. Earthworms 2. Nyapus 3. Okoko 4. Other
(specify) _____

16. Which other economic activities are you involved in apart from fishing?

1. Fish trade 2. Boat building 3. Net repair 4. Other
(specify) _____

17. (a) Do you know whether these activities predispose you to malaria?

1. Yes 2. No 3. I don't know

(b) If yes, what have you done to protect yourself from possible malarial infections?

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18. (a) Do any members of your household use bed nets?

1. Yes 2. No

(b) If yes, why?

(c) Are there others who do not use bed nets?

1. Yes 2. No

(d) If yes, why?

19. (a) Who are mostly affected by malaria in your household? (*tick only one option*)

1. Children under 5 years 2. Children above 5 years 3. Pregnant women
4. The elderly 5. Visitors 6. Other (Specify) _____

(b) How often do they get infected with malaria? _____

20. (a) Where do members of your household seek medical treatment when they get malaria?

1. Self medicate 2. Consult community health workers 3. Visit formal health facilities
4. Use alternative medicine

(b) Why? (*explain briefly*) _____

21. (a) How far is your home from hospital?

1. Less than 1 km 2. 2 km – 4 km 3. More than 5 km

(b) How much do you pay for treatment? _____

(c) Where do you get money for treatment? _____

(d) Between modern and traditional medicine, which is more powerful?

22. Based on your experiences, which of these methods is most effective in preventing malaria?*(tick one option only)*

1. Use of bed nets 2. Drainage of stagnant water 3. Use of mosquito coils
4. Spraying insecticides 5. Clearing grass/bushes 6. Taking malaria drugs

Other *(specify)* _____

23. In your opinion, which occupations predispose most people to malaria infections on Rusinga Island?*(tick all that apply)*

1. Small scale farming 2. Fishing 3. Prostitution 4. Night watchmen
5. Schooling 6. Teaching 7. Others
(specify) _____

24. What can be done to reduce the number of mosquitoes in your community? *(tick all that apply)*

1. Drain stagnant water around the home 2. Clear grass/bushes around the home
3. Spray insecticides 4. Clean the environment around the home 5. Use bed nets
6. I don't know 7. Other *(specify)* _____

25. What challenges do you encounter in preventing malaria? *(probe on access, proper usage, affordability)*

APPENDIX 2: FOCUSED GROUP DISCUSSION GUIDELINES

1. What is Malaria?
2. What causes malaria?
3. How is malaria transmitted?
4. What are the myths about causes of Malaria?
5. When do you fish?
6. Which fishing methods do you use?
7. Which source of light do you use in fishing?
8. How do you dress when fishing?
9. Which other activities do you involve in apart from fishing?
10. Which ceremonies are associated with fishing?
11. Where do you go for treatment when sick of Malaria?
12. What measures do you employ in preventing Malaria?
13. What challenges do you encounter in trying to prevent Malaria?

APPENDIX 3: KEY INFORMANT GUIDE

Location: _____
District: _____
Name: _____
Age: _____
Sex: _____
Marital Status: _____
Education Level: _____
Occupation: _____
Work Experience: _____

1. What time of day is fishing carried out on Rusinga Island?
Morning Evening Night
2. (a) Among men and women, who are likely to be involved in fishing activities?
Men Women
(b) What type of fishing activities are they likely to be involved in?

3. (a) Who among children and adults are mostly infected with malaria on Rusinga Island?
Children Adults Both children and adults
(b) What is the age of those who mostly get infected?

4. How do fishermen dress when going to fish?

5. What are the myths held by fishermen on Rusinga Island about causes of malaria?

6. What ceremonies are associated with fishing?

7. Where do fishermen on the Island seek medical attention?
Visit medical facility Self medicate Use traditional medicine
Other (Specify) _____
8. What methods do the fishermen use to prevent themselves and their family members from malaria?

9. What challenges are encountered in malaria prevention by fishermen of Rusinga Island?
