

ST. JOHN'S UNIVERSITY OF TANZANIA



INSTITUTE OF DEVELOPMENT STUDIES

**HOUSEHOLD'S KNOWLEDGE, ATTITUDES AND PRACTICES ON THE
USE OF INSECTICIDE TREATED NETS (ITNs) IN CONTROLLING
MALARIA: CASES OF ITUNGE AND NGONGA VILLAGES IN KYELA
DISTRICT.**

BY:

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**A DISSERTATION IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR
THE AWARD OF A MASTER DEGREE OF ARTS IN COMMUNITY
DEVELOPMENT OF ST. JOHN'S UNIVERSITY OF TANZANIA**

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2015

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CERTIFICATION

I, the undersigned, certify that I have read and hereby recommend for acceptance by St. John's University of Tanzania a dissertation entitled "Household's perception on the use of Insecticide Treated Net (ITNs) in Controlling Malaria: Cases of Itunge and Ngonga villages in Kyela district", in fulfilment of the requirements for the degree of Master of Art in Community Development at the St. John's University of Tanzania.

.....

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Date.....

DECLARATION

I, **Mariam Duncan Mwaiswelo**, declare that this dissertation is my own original work. It has not been presented and will not be presented for any other course of study. I confirm that appropriate credit has been given where reference has been made to the work of others.

Signature.....

Date.....

DEDICATION

I would like to dedicate this work to my beloved parents Mr. Duncan Mwaiswelo and Mrs. Joyce Palick for their everlasting moral and material support in my life. I will forever Love them.

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LIST OF ABBREVIATIONS

DMO	District Medical Officer
DNO	District Nursing Officer
GoT	Government of Tanzania
ITNs	Insect side Treated Nets
KDC	Kyela District Council
KDH	Kyela District Hospital
LLINs	Longer Lasting Insecticide Nets
MoHS	Ministry of Health and Social Welfare
MDA	Mass Drug Administration
MED	Male Erectile Dysfunction
OPD	Out Patients Department
RBN	Rolling Back Malaria
THMIS	Tanzania HIV/AIDS and Malaria Indicator Survey
TDHS	Tanzania Demographic and Health Survey
URT	United Republic of Tanzania
WHO	World Health Organisation
χ^2	Chi square

ABSTRACT

Over years, Malaria has been major health concern in developing countries particularly in Sub-Saharan Africa. Insecticide Treated Nets (ITNs) were introduced to help the control of Malaria. To increase net ownership among people in Tanzania, the Ministry of Health and Social Welfare (MoHSW) introduced mass free distribution and subsidized ITNs. However, data concerning use as well as knowledge, attitudes and practices on ITNs are scarce. The objective of this study therefore, was to assess households' knowledge, attitude and practices of ITNs in Kyela District. The specific objectives of the study were to determine the knowledge, attitudes and practices of the household members on the use of ITNs, to investigate households' practices in relation to the use of ITNs and also to assess factors influencing the adoption of the ITNs.

The study adopted a cross sectional research design, and a total of 150 respondents were interviewed. Both primary and secondary data were used. Primary data were collected through structured questionnaires, Focus Group Discussions and observation methods, while secondary data were collected from a review of various literatures obtained from libraries and through online sources. The collected data were analysed by using Statistical Package for Social Science version 21. Both qualitative and quantitative data were analysed through simple descriptive statistics, and relationship between variables was tested with Chi square. The study revealed that utilization of ITNs was low compared to the ownership, whereby nearly 72 % of the respondents reported to own ITNs, but utilization of the nets was reported by only 67 %. The study revealed also that ITNs utilization was not satisfactory in

the surveyed villages. And the study found the knowledge gap regarding the issues of ITNs, where more than half (60 %) reported to have inadequate knowledge about ITNs, and nearly 40% of the respondents perceived the ITNs with negative attitude. The study found that negative attitudes on ITNs were attributed to the existing myths and misconceptions. The common reported myths and misconception were like ITNs may cause Male Erectile Dysfunction (MED), and that ITNs have got side effects. Thus, integrating public and private sector in promoting awareness among the people will improve the community's knowledge and attitudes on ITNs hence proper bed nets utilization.

CHAPTER ONE

INTRODUCTION

1.1 Overview

This chapter provides the background information of the study, statement of the problem, the overall and specific objectives of the study, research questions, significance of the study and the chapter summary.

1.2 Background Information

Over the years, the world has been fighting to end Malaria. World Health Organisation (WHO) has pronounced Malaria as a deadly disease (WHO, 2013). Globally, an estimated 3.3 billion people were at risk of Malaria in 2011, Worldwide there are 104 countries and territories in which malaria is presently considered endemic (WHO, 2014). According to WHO (2014), in the year 2013 there were an estimated 198 Million cases of Malaria worldwide, (range 124–283 million), and an estimated 584,000 deaths (range 367,000–755,000). About 90% of all Malaria deaths occur in Africa. Also in 2013, an estimated 437,000 African children died before their fifth birthday due to malaria. Globally, the disease caused an estimated 453,000 under-five deaths in 2013 (URT, 2013). Malaria as a disease contributes significantly to the high maternal morbidity and mortality rates in sub-Saharan Africa. According to WHO, (2012) African region accounts for 85% of malaria cases and 90% of malaria deaths worldwide. Nearly 85% of Malaria deaths occur in children under five years of age. According to WHO (2014), in every 30 seconds a child dies from malaria in Africa.

In Tanzania, over 95% of the 37.4 million people are at risk for Malaria infection (WHO, 2011). The disease is responsible for more than one-third of deaths among children under the age of 5 years and for up to one-fifth of deaths among pregnant women (Tanzania Malaria and HIV/AIDS Indicator Survey, 2013). Malaria contributes to 39.4% of all outpatients of less than 5 years of age, and 48% aged 5 years and above respectively (Chamwali, 2013) In terms of hospital admissions, Malaria accounts for 33.4% of children under the age of 5 years and 42.1% in children aged 5 years and above (TMHIS, 2013). The Estimated annual Malaria deaths in Tanzania is 44 deaths per 100,000 population (Presidential Malaria Initiative, 2012), the ratio of Under-five mortality is 81 per 1,000 live births, or approximately 1 in 12 children die before their fifth birthday (THMIS, 2013).

Kyela district, like other parts of Tanzania, is experiencing the serious problems of Malaria by possessing large number of Malaria patients and deaths especially children less than five years of age. According to Kalinga *et al* (2012), in the study conducted to assess the clinical manifestation of Malaria in Kyela District, it was reported that Malaria was the major cause of childhood death and paediatric hospital admission in Kyela District. The study revealed that about 409 (nearly 30 %) children out of 1371 tested positive for Malaria. Kyela district possessed about 23.1 % of all Malaria cases reported in Mbeya region (Kalinga *et al*, 2012).

One of the most effective tools for Malaria prevention is the Insecticide Treated mosquito Nets (ITNs) (Bashinyora, 2010). By knowing so, the government of Tanzania introduced an initiative of distributing the ITNs as one

of control strategies (National Insecticide Treated Nets, 2012). The initiative of distributing ITNs meant to reach all people in Tanzania, whereas the nets were distributed to all households. THMIS (2013) reported that nearly 95% of households in Tanzania owned at least one ITN. The free mosquito nets distribution enabled the majority in Tanzania to access the nets. In order to ensure proper utilisation of the distributed mosquito nets, people are supposed to have adequate knowledge concerning the use of mosquito nets (Nwana, 2010). However, data have showed that in most communities, people have got inadequate knowledge and poor practice toward the ITNs (McLean *et al*, 2014). Poor or inadequate knowledge on the ITNs have found to be the major reason for people not to use the ITNs properly hence prolonged problem of Malaria (Chukwuocha *et al*, 2010). (Nwana, 2010), reported that poor practices of the ITNs are the results of poor knowledge and bad attitudes towards ITNs. People with little or inadequate knowledge as well as bad attitude towards the ITNs are more likely not to use the ITNs or use them improperly. This study therefore, aims at assessing knowledge, attitudes and practices of the people in Ngonga and Itunge village towards the ITNs.

1.3 Statement of the Problem

Every year, 14-18 million new Malaria cases are reported in Tanzania, resulting to approximately 100,000 - 120,000 deaths. Out of these deaths, 39,000 are children less than 5 years of age (WHO, 2013). In fighting Malaria, ITNs were distributed in almost every household in Tanzania. According to Tanzania Demographic and Household Survey (2010), between 2004 and 2010, ownership of ITNs increased from 23 % to 63% in Mainland and from 28% to 76 % in Zanzibar. This significant increase in distribution of mosquito

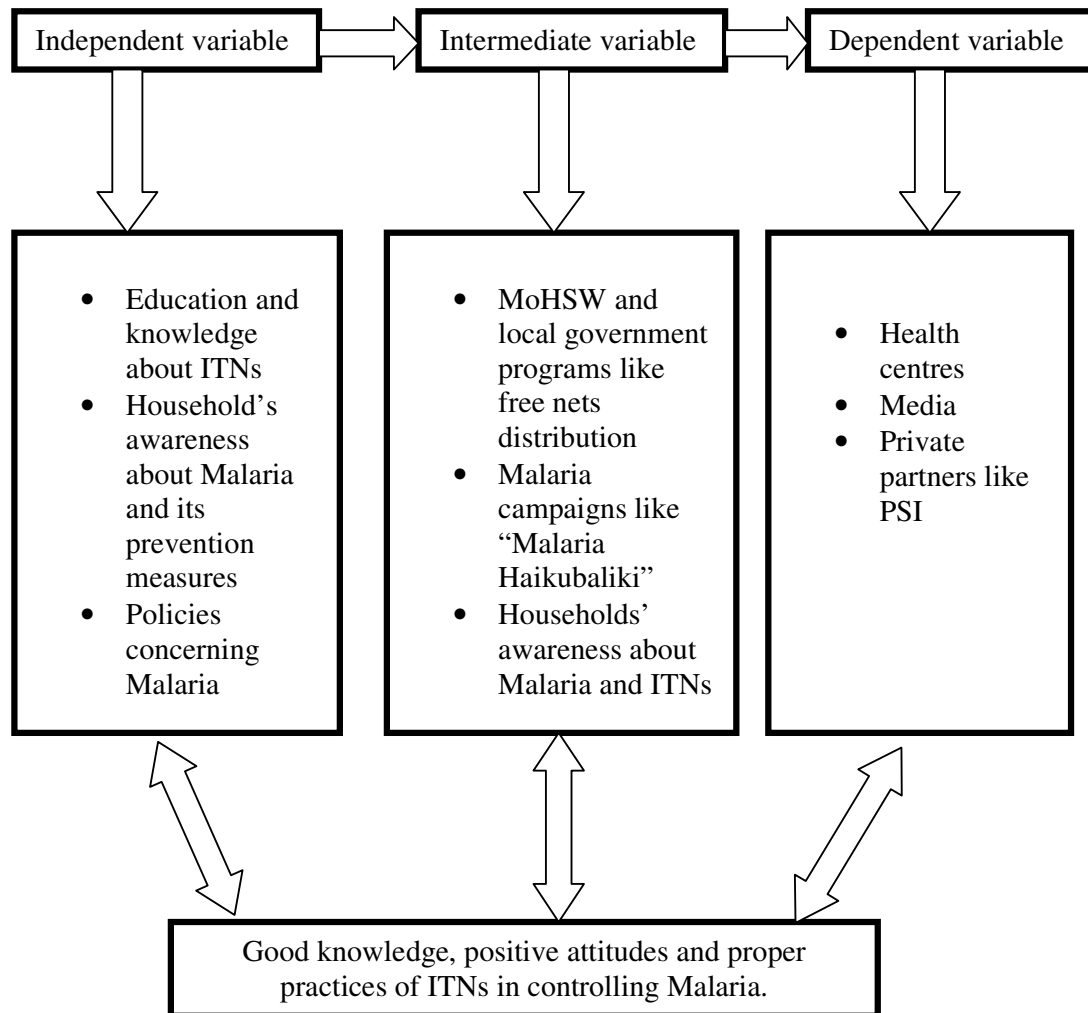
nets was attributed by mass distribution of mosquito nets (NATNETS, 2012). Despite the efforts of distributing ITNs to the people, Malaria is still predominant, and some people or households do not use the ITNs as the strategy for controlling Malaria (WHO, 2014). There is a significant gap between ITNs possession and utilisation (Nwana, 2010). The study conducted by Mutagonda (2012) revealed that inadequate knowledge about ITNs makes people to stop using the nets. Also Nwana (2010) reported that negative attitude and insufficient knowledge about ITNs may be the cause of bad practices of the ITNs hence little utilisation of the nets. Bad practices of the nets increase the problem of Malaria which continues to be the cause of deaths and sufferings among the people especially children under five years of age as well as pregnant women. Malaria continues to be among the economic burden in Tanzania (Chamwali, 2013), thus order to reduce the consequences of Malaria ITNs should be properly utilised by all people. This study aimed at covering the existing knowledge gap regarding the data about household's knowledge, attitude and practices on the use of ITNs in controlling Malaria, especial at the local/grass root level. As the information about knowledge, attitude and practices about ITNs especially from the local levels is still missing, causing prevalence of Malaria among the communities, and Malaria carries a major economic and social burden as a lot of resources and time is spent in attending the patients. The obtained information from the study covered the existing gap of knowledge about ITNs at the local level.

1.4 Conceptual Framework

The conceptual framework shows the relationship between independent, intermediate and dependant variables. Independent variables in this study

include education and knowledge about the ITNs, household's awareness about Malaria and its prevention measures and also policies about Malaria. Intermediate variables include Malaria and Its campaigns, Ministry of Health and the local government projects like free ITNs distribution. Dependent variables include health centres, media and the private partners like PSI. Thus, in the whole process ensuring good knowledge and proper practices of ITNs in ending Malaria all these variable must be included.

Figure 1: 1 Conceptual Framework



1.5 Research Objectives

This research was done basing on the following general and specific objectives;

1.4.1 General Objective

The general objective of this study was to assess households' knowledge, attitude and practises towards the use of Insecticide Treated Nets (ITNs) in controlling Malaria.

1.4.2 Specific Objectives

The study was specifically intended to;

- i) Determine the knowledge and attitude of the household members on use of insecticide-treated bed nets (ITNs).
- ii) Identify households' practices in relation to the use of ITNs.
- iii) Assess factors influencing adoption of ITNs.

1.5 Research Questions

- i) What are the knowledge and attitudes of the people on the use of ITNs?
- ii) What are the households' practices in relation to adoption of ITNs?
- iii) What are the factors influencing the use of ITNs?

1.6 Significance of the Study

The general objective of this study is in line with the Millennium Development Goal number 6 which aims at combating HIV/AIDS, Malaria and other diseases. The findings obtained from this study are expected to help in

addressing the issues concerning the knowledge, attitudes and practices on using ITNs; the findings are also expected to help in identifying ways of improving the proper use of ITNs in preventing Malaria. The study can also help other studies interested on issues concerning adoption or use of ITNs, and policy makers to accommodate challenges identified in this study in planning for Malaria control measures. This study is also important because it improves the knowledge and good practices over ITNs.

1.7 Definition of Terms

1.7.1 Insecticide Treated Nets

An insecticide-treated net (ITN) is a factory-treated net that does not require any further treatment, a net that has been soaked with insecticide within the past 12 months (THMIS, 2013). The subsets of ITNs are called Long-lasting insecticidal nets (LLINs). An LLIN is a factory-treated mosquito net made with netting material that has insecticide incorporated within or bound around the fibres. The current generation of ITNs LLINs lasts three to five years, after which the net should be replaced. Insecticide-treated bed nets (ITNs) are a form of personal protection that reduces the chances of mosquito bites. ITNs have been proven to be the reliable Malaria control strategy, when used properly (URT, 2009).

1.7.2 Malaria

Malaria is a mosquito-borne infectious disease of humans and other animals caused by parasitic protozoans (a type of single cell microorganism) of the Plasmodium type. Malaria causes symptoms that typically include fever,

fatigue, vomiting and headaches. In severe cases it can cause yellow skin, seizures, coma or death (URT, 2013).

Malaria is the disease caused by four species of plasmodia parasites that are transmitted by Anopheles mosquitoes. A plasmodium falciparum mosquito causes severe Malaria, which can be fatal if not recognized promptly and properly managed (THMIS, 2012). The most severe cases occur among persons who have not yet developed sufficient immunity to malaria through previous exposure (for example, young children) or who have reduced natural Malaria immunity (for example, pregnant women). Children under age of 5 years are at highest risk. Pregnant women are four times as likely to experience the complications of Malaria compared to non-pregnant women, and Malaria is a major cause of pregnancy loss, low birth weight, and neonatal mortality. Malaria can be prevented through various strategies; the commonest one is through the use of ITNs and LLNs (URT, 2013).

1.8 Chapter Summary

The chapter above explains the general introduction to study. The chapter has explained the background of the problem, statement of the problem regarding the issue of Malaria and utilisation of ITNs. The chapter has also explained about the general aim of the study, research question, the significance of the study and provided some definition of key terms. The next chapter will provide the literature review and theoretical review.

CHAPTER TWO

LITERATURE REVIEW

2.1 Overview

This chapter provides the critical explanations on theoretical and empirical reviews concerning the issue of knowledge, attitude and practice related to the use of ITNs.

2.2 Theoretical Framework

The theoretical review provides an insight background of the theories that exists within the study, whereby the adoption theory provided clear explanations about the knowledge, attitude and practises in relation to the adoption/use of ITNs.

2.2.1 The Adoption Theory

Adoption means that a person does something differently than what they had previously (purchase or use a new product, acquire and perform a new behaviour). The key to adoption is that the person must perceive the idea, behaviour, or product as new or innovative (Boston University, 2013). According to Bhasin (2015), adoption theory aims at understanding, explaining, or predicting how, why, and to what extent individuals or organizations will adopt or purchase new offerings. According to the adoption theory, multiple factors like comparative advantage, complexity, compatibility, innovation, decision- knowledge and attitude, communication channel, social system and efforts of promotion, are involved in influencing product or service adoption by an individual or organization, and theories of adoption recognize all these factors (Rogers, 2003). The knowledge and experience of the

potential adopter, the degree of innovation that is communicated by a new product or service offering and the extent that a potential adopter values innovativeness are just some examples of potentially influential factors in determining the rate and extent of adoption (Bhasin, 2015). As per adoption theory, the ITNs are reflected to be the new product/ideas that are supposed to be adopted and used by individuals. As the theory suggests, in order for individuals to adopt and use the ITNs multiple factors like knowledge, decision, attitudes, communication with the individuals and efforts to promote the ITNs must be put in considerations. These factors are important in influencing the adoption and use of ITNs to the individuals. The rate of adoption and use of ITNs depends on the extent to which individuals/people have the adequate knowledge, good attitude and good decision. These factors are influential in ensuring adoption and proper practices of the ITNs by the individuals.

Thus, the adoption theory suggest that in order to promote and make people adopt or choose to use the ITNs, there is a need to look into their knowledge, attitudes and understanding of the ITNs. As the theory explains, various factors are to be considered in order to ensure that all individuals use the nets. In order to improve the use of ITNs among the individuals the suggested factors from the adoption theory have to be included. Aside from promotion efforts that have been successfully done in Tanzania, factors like product's (ITNs) knowledge and attitude among the individuals have to be clearly considered. Proper knowledge and positive attitude towards ITNs will enable people to use the nets in proper and intended manner.

2.3 Empirical Framework

The empirical framework provides the discussion on what others have done regarding the issue of knowledge, attitudes and practices of households in relation to ITNs. This framework will review the studies conducted in Asia, and in some African countries, and also the review of the study from other parts of Tanzania.

2.3.1 Asia Experience

2.3.1.1 India

The study conducted in North East India by Prakash, Bhattacharyya, Mohapatra, Goswami, & Mahanta (2008), revealed that information on sleeping habits, bed net ownership and use/practices, as well as feedback of communities in ITN-targeted areas still missing in majority parts of India. The study reported that in most parts in India where ITNs were introduced there were little community's response towards the ITNs. The study found average bed net usage among the families. Bed net use was mostly seasonal in majority parts where nearly 65.1-78.7% of the families used bed nets only during summers and monsoon. The study also found little acceptance of the ITNs due to reasons like dislike, lack of proper information as well as little knowledge or understanding of the ITNs (Prakash *et al*, 2008). Like other parts, the study also found that the free ITNs distribution helps the majority to access the bed nets. More than half of the respondents reported to acquire the bed nets free of cost.

2.3.2 Africa Experience

2.3.2.1 Nigeria

The study about the ITNs utilisation conducted in North East Nigeria with 197 respondents showed that although most of the people (nearly 96%), had knowledge of ITNs, only 67.01% reported to own nets and much less 49.24% reported to use them. The study found that age, educational status, occupation, ethnic groups and religion did not influence the use of ITNs among the people. About 32% of the ITN non-users reported inadequate knowledge and poor beliefs or attitude, as reasons for non utilization (Ibrahim *et al*, 2014). Others reported uneasy feeling and cost being the reasons for not adopting the ITNs. The study revealed poor practices of ITNs whereby people were found to use the nets for other uses like covering garden and for covering harvests.

2.3.2.2 Ethiopia

Another study conducted in Ethiopia by Kaliyaperumal & Yesuf (2009), found that respondents had inadequate knowledge regarding ITNs and Malaria related information. And also, inhabitants were found to have poor attitude and practice towards the ITNs to existing myths and misconceptions. Also lack of availability and unaffordable price was the reason for non-utilisation of ITNs. The study suggested that increase health education campaigns, distribution and promotion of ITNs to entire rural residents at free of charge may possibly bring constructive outcome.

2.3.3 Tanzania Experience

Also a number of studies have been conducted regarding the use of ITNs in Tanzania.

The study conducted by Ambrose, Mazigo, Heukelbach, Gabone & Mwizamholya (2011) assessed the knowledge, attitude and practices against Malaria and bed net use among women seeking antenatal care in South Western Tanzania, revealed that there was a scarce knowledge, negative attitudes and poor practices toward ITNs. According to the study, among the 222 pregnant women included, 78% owned a bed net, but the use of bed nets was mentioned by 64%. The study reported that, 46% of women were not using bed nets. The study reported that, the respondents who appeared not to use the ITNs were reported to have negative attitude toward the treated bed nets as they believed that the ITNs have got effects, and others reported cost and poverty as the reason which made them not to use the ITNs. The study found that education level and economic status were associated with the behaviour to sleep under treated bed nets (Ambrose, et al., 2011).

Another study conducted in rural Geita, North-West Tanzania based on knowledge, attitude and practices about Malaria and its control, found that out of 366 respondents, the level of bed net ownership was 77.3% but the usage was only 64.5%. The use of ITNs was significantly associated with education level (Mazigo *et al.*, 2010). However in this study most respondents (86.3%) agreed with indoor residual spraying of insecticides instead of the ITNs in controlling Malaria.

The studies conducted in Asia, India in particular, some parts Sub Saharan Africa region and in some parts of Tanzania, reveal that in many areas people reported to own the ITNs. However, the studies portray that, the extent of ownership of ITNs among people does not comply with net usage. Majority reported to own ITNs, but only few were using them. Poor practices and bad attitude towards the ITNs was reported by both studies to be the reasons for why some people do not use the ITNs. This indicates that, people were given the ITNs but they were not given the proper education and emphasis on using them, hence caused the bad attitude and improper practices toward ITNs. In India the study revealed that little acceptance of the ITNs was due to little knowledge and lack of information about the ITNs. Therefore, for proper information and understanding of the importance of ITNs can increase the extent of ITNs use among the people (Bhasin, 2013). Also proper information can reduce negative attitudes and improve proper practices of ITNs.

2.4 ITNs Ownership and Use in Tanzania

According to Tanzania Demographic and Household Survey (2012), about 95% of Tanzanian owns at least one mosquito net. This significant increase in ownership of mosquito nets can be attributed to the government health programme of mass distribution of ITNs aiming at controlling Malaria. TDHS (2012) reported that rural households were less likely than urban households to own mosquito nets (72 and 84 percent, respectively). However, despite the significant increase in net ownership in Tanzania, it was found that the usage of the nets do not goes in hand with the ownership, as many people owns the nets, but the utilization was not satisfactory. Studies conducted in various regions of Tanzania by Mclean *et al* (2014), Kalinga *et a l*(2012), Mazigo *et al*

(2010) and Mutagonda (2012), reveals that despite mass distribution of the ITNs, the minimal usage of the nets given was reported. The studies found improper or unintended uses of ITNs as well as poor beliefs and attitudes towards the ITNs as among the hindering factor in using ITNs.

2.5 Research Gap (s)

The most addressed issue about the ITNs is the insistence of the use. Many campaigns are done on insisting people about the use of ITNs. But the issues concerning knowledge, attitude and proper practices of ITNs are not well addressed yet; also there are scarce data about the community's knowledge, attitudes and practices on ITNs especially at the local levels. Therefore this study assessed household's knowledge, attitude and practices especially in relation to the adoption and use of ITNs.

2.6 Chapter Summary

The chapter above provided the literature and theoretical review. It also gave an overview of ownership and use of ITNs in Tanzania. The chapter offered the comparative discussion on various studies about Malaria and ITNs that were conducted in various places inside and outside Tanzania. The next chapter is going to narrate the methodological approach for this study.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Overview

This Chapter gives the description of the methods used by the study. The chapter explains the study area selection and criteria, research design and description, research approach, and data analysis and presentation. In short the chapter gives the clear picture on how the study was carried out.

3.2 Research Design

A research design can be thought of as the structure of research. A research design can be regarded as an arrangement for collection and analysis of data in a manner that aims to combine relevance with the research purpose (Orodho, 2003). The study used cross sectional research design. The cross section design is a study that involves the analysis of data collected from a population, or a representative subset, at one specific point in time (Williams, 2009). A cross section sectional research design was convenient to this study because it involved going to the field only once and gather all the required in formation. Also a cross sectional design was much convenient because it has a triangulation advantages in which several data collection methods were used to ensure data accuracy. A cross section design was suitable in getting viable and reliable data from various sources and it also minimized costs and time.

3.3 Study Setting / Area

3.3.1 Description of the Study Area

Kyela District Council is located in the Southern end of Mbeya region and is one among 8 Districts in the region. The district lies between 35° 41' and 30° Longitudes East of Greenwich meridian and 9° 25' and 9° 40' Latitudes South of Equator. In the East Kyela district borders with Makete and Ludewa districts (Njombe region), in the West it boards with Ileje district, and in the north with Rungwe district (Mbeya region), while in south the district boards with the Republic of Malawi and the Lake Nyasa (URT, 2013). The study used two Villages in Kyela District which are Itunge and Ngonga. The study used a typical rural village which is Ngonga village and semi-urban village which is Itunge villages.

The study area was selected based on the fact that, Kyela is among the district in Tanzania where the problem of Malaria is so critical. Kyela district has the typical tropical climate which attracts mosquito breeding, making the district vulnerable to Malaria. The study used Ngonga and Itunge villages because the villages present a number of poor villages in Tanzania with agriculture as their major economic activity, the people in the villages live in poverty and cannot afford their life expenses such as buying the Insect side Treated bed nets. The study used a typical rural village- Ngonga village and semi-urban village –Itunge village in order to get different responses basing on different experiences and challenges basing on the nature of the villages.

3.3.2 Climate and Vegetation

Kyela District receives heavy rains between November to June with a mean annual rainfall between 2000mm and 3000mm. Normally in April and May the District experiences heavy rainfall. The District has a warm and humid climate with mean daily temperature of 23° C. The natural vegetation is of tropical savannah forest and grass lands with lagoon vegetation on the swamps and river mouths to the Lakes. An interesting feature of Kyela is that despite its heavy rains, they only seem to fall (for the most part) at night.

Figure 3. 1: Average Annual Rainfall (mm)



Source: KDC, 2014

3.3.3 Land Area and Distribution

Land use pattern

The District has an area of 1322 km² (132,200 hectares).

Table 3. 1 Error! Reference source not found.: **Land use distribution**

LAND USE	AREA IN HECTRES	PERCENTAGES
Forest	6320	4.7
Cultivated land	48,128	36.4
Open land	1,872	1.4
Water feature	45,000	34.5
Residential area	30,880	23.2
Total	132,220	100

Source: Land Planning Officer, (KDC) 2013.

3.3.4 Demography (Population Size and Growth)

According to National Population and Household Survey Census (2012), the District had 221,490 people with an annual growth rate of 2.4% and population distribution was estimated to be 168 inhabitants per sq.km. Average population density in the District is 168 people per sq.km, this being above the Regional average of 45 people and National average of 51 persons per sq.km. The average household size in the District is 4.1 persons.

3.3.5 Ethnic Groups and language

Nyakyusa is the major ethnic group found in Kyela District. Other ethnic groups are Ndali, Kinga, Ngoni and Kisi. As in the rest of the country, Swahili

is the language used for official communication, and is the spoken language amongst townspeople. However, Nyakyusa (language of the Nyakyusa people) is the language spoken in Kyela's villages (as well as those in other districts of Mbeya region). Although the great majority of people also know Swahili, many of the elderly people and very young children (who have not yet gone to school) only speak Nyakyusa (URT, 2013).

3.3.6 Education

The district has 99 primary schools and nine secondary schools (Form I to Form IV), of which seven are governmental and two are private. In Kyela district, 29% of females and 19% of males aged 5 and above had never attended school. For the rural population, the total of those aged 5 and above who had never attended school is 26%, while in urban areas the total is 10%. Although primary school is free in Tanzania, but lack of attendance resulted from students lacking uniforms and school supplies (poverty) (URT, 2013).

3.3.7 Health Services

Kyela District had health facilities spread almost within 5 Km to reach each member of household. The District has 1 District Hospital, 1 Faith based Hospital, 1 Health Centre, 27 Government Dispensaries and 8 Charitable/Private Dispensaries. Malaria is the major disease affecting the majority in the district (URT, 2014).

3.3.8 Economy

Agriculture

Many people in the district (about 80%) depend on agriculture. The mostly cultivated food crops are paddy, maize, banana, sweet potatoes, cassava and groundnuts. The major cash crops were cocoa, cashew nuts and palm oil. The three crops contribute to the income of the people by 65% of their total income and 70% on the district GDP. Farming activities are conducted using oxen; tractor and hand hoes in family labour base which results into low yields per area. Farming was mainly done in small scale, and the farms were in sometimes near their homes. And for the cocoa farms, in most cases are just near the houses (the cocoa trees surrounded the households), making a suitable environment for mosquito breeding and increases the chances of people getting Malaria.

Plate 3.1: A house surrounded with cocoa trees



Source: Field data, 2015

Livestock

Animal keeping is another source of income for people in Kyela. The main animals kept were cattle and chicken (both native and imported), pigs, ducks, sheep, and goats. The livestock industry in Kyela is not well-developed as compared to other parts of the country. The number of cattle in the entire district was 23,340 making the average of one cattle per seven people (URT, 2013).

Fishing

Fishing is practiced by many people in the district, particularly those living in villages along Lake Nyasa and on river banks. Small boats made from tree trunks are used in fishing and during breeding times, the nets are used in fishing (URT, 2013).

Small Business/ Trade

About 3.9% of Kyela's population is engaged in small business. Because of its location near the border to Malawi, trade (both legal and illegal) is hot between the two countries. Of particular note is brown sugar, sold by street vendors at Border town (URT, 2013).

Industry

Although the manufacturing industry is just in its early stages, the district is growing rapidly, and it has a lot of potential. The red palm oil processing industry has begun oil and soap production on a small scale. Other industries with potential for the district include cocoa processing (heat-treating, roasting, and oil extraction), cashew nut roasting and packaging (in Ipinda and

surrounding areas, where most of the cashew nut production occurs), and fruit processing (canning, drying, wine-making, etc.) (URT, 2013).

3.4 Research Approach

This study comprised both qualitative and quantitative approaches. Two sources of data such as primary and secondary data were used to gather information required by the study. Different methods were applied in order to increase the reliability of the collected data. According to Kothari (2009), the use of different methods known as “triangulation” minimizes the possibility of making erroneous conclusion and increases the credibility of the findings. The study used different tools to secure their accuracy and to validate collected data. Using more than one data collection instruments allowed the study to combine strengths and correct some of the deficiencies of using only one source of data.

3.4.1 Primary Data

Primary data or original data were collected from the respondents. Methods such as structured and unstructured questionnaires and interviews, observation, focus group discussion and photo taking were used to collect data from the field. These methods were applicable in obtaining relevant facts about respondent’s knowledge, attitude and practices towards the ITNs. The questionnaires were written in English language and were translated into Swahili to facilitate formal discussion with the respondents. Most of the interviews were conducted at respondent’s home places and some in other agreed places. Primary data was collected through; semi structured interviews, questionnaires, focus group discussion and observation.

Semi Structured Interviews

Data were collected through conversation between the researcher and respondents whereby different questions were posed by the researcher to the interviewee. The interviews were done specifically to the key informants (health experts/attendants) to explore more information.

Structured Questionnaires

Structured questions as a source for primary data were used to explore more information based on the objectives of the study. Both close ended and open ended structured questionnaires were used. This method was used because it enabled the study to collect large amount of information from large number of people within a short period and in a accost effect manner (Kothari, 2004).

Focus Group Discussion (FGDs)

FGDs are used to collect information from respondents for issues that need agreement or general understanding (Krueger, 2006). FGDs enabled discussants to express and interchange their views on the attitude and practices of the households about the use of ITN in preventing Malaria. FGDs were conducted in four groups, two groups in each village. The groups composed 8-12 discussants of 18 years of age and above. The study used the checklist guide to guide the discussion, where by various issues concerning ITNs were tabled and the discussants discussed them. The discussion was conducted in the agreed area with the discussants. Data collected was recorded by noting down the key points of the discussed matter. The data from FGDs were reported by using pseudo names in order to maintain the confidentiality of the respondents.

Observation

This was the method where information was collected by direct observation without asking the respondent (Kothari, 2004). This technique was employed because it is accurate and free from subjective bias, therefore provide information that relates to what was happening in the area. Observation captures great range of information and gives opportunity to compare what the respondents reported with what was observed (Cresswell, 2005). The study observed various things and issues including how nets were used, level of affluence of the respondents by looking at the type of the house, and the general surroundings of the study area and respondents' homes.

3.4.2 Secondary Data

Secondary data was collected through reviewing of related documents to the study from previous research reports concerning the issue of Malaria. Secondary data were obtained from library, official government documents from Kyela District Council (KDC), from Ward Executive officer (WEO), and from District Medical Officer. Also various documents and papers/ journals and books from various sources like the internet, magazine and library were reviewed.

3.5 Study Population and Sample

3.5.1 Sampling Frame

This is a list of elements where sample was selected. According to 2012 census the total number of Itunge and Ngonga villages population is 46, 662. The sampling frame for the study involved all members in the villages with age group from 18 years, and the key informants like District Medical

Officer (DMO), District Nursing Officer (DNO), health attendants, and the Ward Executive Officers (WEOs).

3.5.2 Sampling Unit

This is a unit from where sample was selected (Rwegoshora, 2006). The sampling unit was the households from Itunge and Ngonga villages, health attendants and WEOs.

3.5.3 Sample Size

A sample of 150 respondents was involved in the study with the following distribution: Women and men in Itunge and Ngonga villages, Ward Executive Officers, District Medical Officer, District Nursing Officer, and health attendants from health centres. The following formula by Yamane (1967) was applied in identifying the number of sample to be used.

$$n_1 = N / (1 + N (e)^2),$$

But 'N' is the total population of the two villages,

Where; N_1 is total population of Ngonga village (14,777 people)

N_2 is total population of Itunge village (31,885).

Therefore $N = N_1 + N_2$, which is $14,777 + 31,885 = 46,662$.

'n' is sample size,

Where $n = n_1 + n_2$ and

'e' is constant (10% or 0.1)

Therefore; $n_1 = 46,662 / (1 + 46,662 \times 0.1^2) = 99.78$

$n_1 = 100$.

But n_2 is total number of key informants, (Two wards officers, two clinical officers, and Regional Medical and Nursing Officer), which makes 106

respondents. The study added 44 respondents to make a total of 150 respondents. This was done in order to increase the number of sample as larger sample are considered to more representative.

Table 3. 2: Respondents Sample Composition

Type	No. of Respondents
Women	71
Men	71
Ward Executive Officer (WEO)	2
District Medical Officer (DMO)	1
District Nursing Officer (DNO)	1
Health attendants	4
Total	150

Source: Field data, 2015

Both purposeful sampling and simple random sampling procedures were employed in the selected Villages, 142 respondents (members of the households) were randomly selected from two villages. Also two wards executive officers, DMO and DNO from Kyela District Hospital (KDC), and four health attendances from Ngonga Village Dispensary were purposively selected based on the criteria that those key informants were convenient to the study because they provided the key information concerning the issue of

ITNs. Thus made a total sample size of 150 respondents both males and females.

3.5.4 Sampling Procedures

Respondents were obtained through simple random sampling and purposive sampling.

Simple Random Sampling

Under simple random sampling, respondents were obtained through random selection where by every individual in the community had an equal chance of being selected. This simple random sampling enabled the study to obtain the respondents without any bias.

Purposive Sampling (Convenient Sampling)

This method was used to obtain the convenient sample required by choosing the respondents purposively. This method was employed in order to obtain the information from the key informants. The convenient sample for this study was medical experts /health attendants, the WEOs, etc. This method helped to extract the concrete information from people with expertise and experience in the field.

3.6 Data Analysis and Presentation

3.6.1 Data Analysis

Both qualitative and quantitative data were analyzed using computer software known as Statistical Package for Social Sciences (SPSS) version 21. Analysis was done using descriptive statistics. Also some quantitative data were

analysed by Chi-square in order to cross check the relationship between variables. Tables and figures were used to present frequencies and percentages.

3.6.2 Data Presentation

The processed and analysed data were presented by using tables, charts and word statements. Data were presented based on each specific objective.

3.7 Validity and Reliability of Data

3.7.1 Validity

Validity refers to the extent to which an account accurately represents the social phenomena to which it refers. It is concerned with whether measurements provide information needed to answer research questions (Cooper & Schindler, 2003). Validity is the measure of accuracy. To ensure validity, data collection tools were developed under the close supervision of the supervisor, and also the tools were pre-tested to ensure they are understandable before used by the respondents.

3.7.2 Reliability

Reliability refers to quality of measurement that leads to repeatability and accuracy of the answers to the questions (Cooper & Schindler, 2003). It is sometimes difficult to achieve reliability in qualitative studies due to difficulties in replicating the identical phenomena of the original study. However, to ensure reliability of data well structured data collection techniques were applied. The study used triangulation methods whereby different data

collecting methods like questionnaires, interviews, FGDs and observation were applied in order to ensure that data are free from errors and biasness.

3.8 Ethical Considerations

Social science involves the studies of real people in real situations which require protections of the rights and welfare of the participants in the study (Kothari, 2009). This study took into considerations of all the ethical issues. All the issues regarding the research ethics were considered.

Informed Consent

All the participants were given the informed consent. Before the beginning of interview or questionnaire filling, participants were briefed concerning the study and why it was conducted. The participants were given the freedom of refusing to answer any question or even withdraw from participating.

Confidentiality Issues

The study kept all the information given by the participants confidential. The information given by the respondents were not shared to any one, and all the filled questionnaires were kept in a safe and confidential place. And the study used pseudo names in quoting and reporting the respondents from the Focus Group Discussions.

Risk-Benefit Analysis

Regarding the issue of risk and benefit, the researcher gave the best by being keen with the time. The researcher kept the time; there was no wasting of time of the participants. And also the researcher explained to the participants

concerning the importance of the study and how it was expected to help in improving the situation concerning the problem of Malaria.

Protection of Human Subject

The study ensured the protection of all human subjects. Both vulnerable groups and the minority were protected. Also the study put into consideration the issue of gender and all other issues concerning human.

3.9 Limitation of the Study

The study experienced some limitations. The major limitation of the study was language, as for most of the community members in Kyela district speak their native language that is Nyakyusa language. It was a little harder during the interviews, but to overcome the challenge a person to interpret words and sentences from Nyakyusa language to Swahili language was found in order to easy up the communication. Another limitation was that, the data collection period was also the weeding period (paddy weeding) in Kyela, thus it was hard to find the respondents as most of the people were on the farms. To solve this, the study interviews and discussions were conducted in the evening, where people were already at their homes from farms. Other limitations were like time limit, financial challenges and remoteness of other areas. The study coped with those challenges by being time effective, and reduced unnecessary costs and also tried to reach the remoteness areas by using motorcycle. To ensure data accuracy the study used the triangulation method to cross check the information from interviews, FDGs, document reviews and observation.

3.10 Chapter Summary

The study was conducted at Itunge and Ngonga Villages where cross-section design was employed, simple random sampling was used to identify the 150 households and the purposive sampling used to get two key informants. The primary and secondary data were analyzed by using Statistical Package for Social Sciences (SPSS) version 21. The chapter discussed the research design, research approach, study area, sample and sampling technique, data collection method, data analysis, data organization and presentation and ethical consideration as given by the St. John's University of Tanzania (SJUT) research policy. The chapter provided the description of how data was collected and analysed ready for being discussed and presented in the coming chapter. The next chapter gives detailed discussion about research result and findings.

CHAPTER FOUR

RESEARCH RESULTS AND DISCUSSION

4.1 Overview

This chapter presents the research findings, results and discussion. The results discussion are based and arranged according to the objectives of the study. The discussion is about people's knowledge, practices and perceptions on the use of ITNs in controlling Malaria, social economic characteristics and other variables in relation to the study and reactions of the respondents.

4.2 Socio-economic Characteristics of the Respondents

The analysis for socio-economic characteristics of the respondents from Ngonga and Itunge villages included parameters such as age, marital status, sex, occupation, educational level and economic activities. These variables in this study were significant to determine household's characteristics in relation to the knowledge, practices and attitude in using the ITNs.

4.2.1 Age Distribution of Respondents

Respondents were asked to mention their age which was an important character to relate with adoption of ITNs. As presented in figure 4.1, the results show that, about 37 % of the respondents were in the age group of between (30-44) years followed by 28 % of the respondents who were in the age group of between (18-25) years, and 25 % were in age group of between (45-64) years and finally (10 %) of the respondents were in the age group of 65 years and above. The results implied that, the study cut across all ages hence young, adults as well as elders were all included in the study. This was important in understanding different opinions from different age groups related

to households' knowledge, attitude and practices on the ITNs and to understand how much their level of understanding on ITNs and the issues of Malaria according to their age.

Table 4. 1: Respondents Distribution by Age

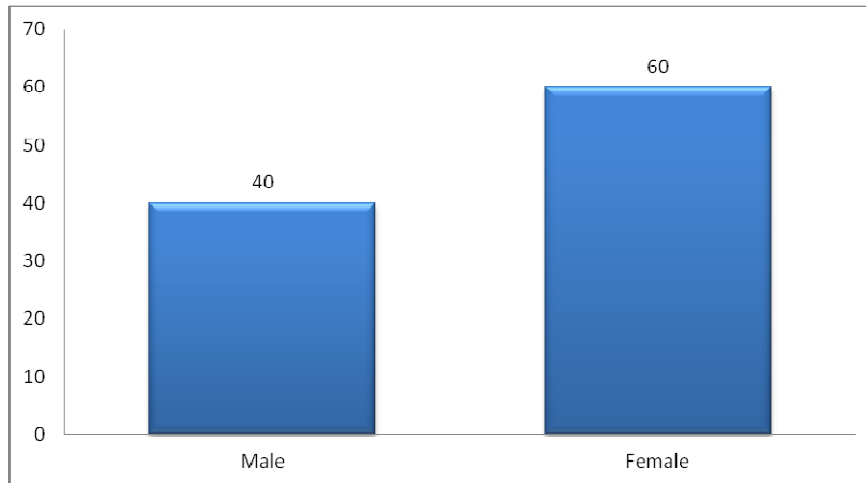
Age category of the respondents	Frequency	Percentage
18-25	42	28
30-44	55	37
45-65	38	25
65+	15	10
Total	150	100

Source: Field data. 2015

4.2.2 Gender of the Respondents

With regard to gender composition of respondents from the study area, 60% of the respondents were female, and 40% of the respondents were male. This was because women were mostly found at home during the interviews compared to men. The study found that, men rarely settled at home, as they use much of their time in walking around in social gatherings than staying at home. Christ, (2013) reported that, due patriarchy system men do not involve themselves in household chaos, they use much of their time in community politics and social gathering chats, thus they are rarely found at home during day time.

Figure 4.1: Gender of the Respondent (%)



Source: Field data, 2015

4.2.3 Marital Status of the Respondent

Marital status of the respondents was assessed in order to determine the influence of marriage/marital status in adoption and use of ITNs. The result showed that about 56% of the respondents were married while 21% of the respondents were still single. Also 5% of the respondents were divorced and 4% of the respondents were separated, while about 14 percent of the respondents were widowed. In this study, majority of respondents were married (about 56 %). The study found that married respondents were more likely to use the ITNs compared to single respondents (Table 4.3). The study revealed that married couples were seemed to have knowledge about ITNs and seemed to adopt the use of ITNs easily. This study resembles with the study conducted by Ambrose *et al*, (2011) who argued that, the use of ITNs among the married couples have been found to be increasing.

Table 4. 2: Marital Status of the Respondents

Marital Status of the Respondents	Frequency	Percentage
Single	32	21
Married	83	56
Divorced	7	5
Separated	6	4
Widowed	21	14
Total	150	100

Source: Field data, 2015

4.2.3.1 Relationship between marital status and Sleeping under ITNs

As shown in Table 4.3, the result shows significant relationship between marital status and sleeping under ITNs at chi square (χ^2) of 40.433 at significant level of $P=0.000$. The results appeared this way because 81 % of respondents who were married reported to sleep under ITNs and to 62 % of the respondents who were divorced reported to sleep under the ITNs, followed by 57 % of respondents who were separated reported to sleep under ITNs, while only 27 % of the respondent who were single reported to sleep under ITNs, and also only 21% of the widowed respondents were also observed to sleep under ITNs. With this picture it implies that married people observed to sleep under ITNs because they have high experiences compared to people who are single. This result is not surprising because people who have family and those who have already had family have got enough experience and are more carefully about the issues of diseases compared to

single individuals. This is similar to Mazigo *et al* (2010) who found that to marital status has influence in adoption of the ITNs while and it was reported that the use of nets among married women was higher compared to unmarried women. These results are also similarly to Ibrahim *et al* (2014) reported that married couples are more likely to adopt and use the ITNs compared to single individuals.

Table 4. 3: Relationship between marital status and Sleeping under ITNs

Marital status of the respondents	Sleeping under ITNs		X ² value	Sig.
	Yes	No		
Single	27%	73 %		
Married	81%	19 %	40.433	0.000
Divorced	62%	38 %		
Separate	57 %	43%		
Widowed	21 %	79 %		

Source: Field data, 2015

4.2.4 Levels of Education

The study assessed the levels of education of the respondents in order to check out its influence in adoption and use of the ITNs. The analysis shows that, 54% of the respondents attended seven years primary education, also 3.3% and 2% of the respondents attended four years and eight year to attain primary education respectively, in addition 10% of the respondents attended diploma level of education, 4% of the respondents attended A-level secondary

education, compared to 5.3% of the respondents possessed a certificate, 9.3% of the respondents were having ordinary level certificates while about 3.3% of the respondents did not complete the O-level secondary education. Moreover, 6% of the respondents were having vocational education compared to 3.4% degree holders. This findings shows that majority have 7 years primary level of education counts (54%) which was enough for them to have knowledge regarding adoption and use of the ITNs in the study area.

These results are similarly to (2014) and Mazigo *et al* (2010) who reported that, education level and knowledge of ITNs were significance in taking preventive measures regarding the cause and impact of Malaria. Also the study conducted by Kessie *et al* (2014), reported that there is a significant relationship between the level of education and the knowledge and adoption of ITNs. Also it was reported that the longer years of schooling determines high level of knowledge and understanding about certain phenomena (Bhasin, 2015).

Table 4. 4: Education Level of the Respondents

Response	Frequency	Percent
Informal Education	4	2.7
4yrs Primary Education	5	3.3
7yrs Primary Education	81	54
8yrs Primary Education	3	2
Uncompleted	5	3.3
Secondary education		

Secondary Ed. (O-Level)	14	9.3
Secondary Ed. (A-Level)	6	4
Vocational Education	9	6
Certificate	8	5.3
Diploma	10	6.7
Degree Level	5	3.4
Total	150	100

Source: Field data, 2015

4.2.5 Religion of the Respondents

The study sought to know the religion of the respondents in order to see if there would be any relationship between respondent's religion and their attitude and practices concerning the use of ITNs. The analysis observed that, most of the respondents were Christians (97.3%), while 2.7 % of the respondents were Muslims. With this result, it was hard to measure the influence of religion in adoption of the ITNs as one religion (Christian) was dominant. Thus measuring this would be biased.

Table 4.5: Religion of the Respondents

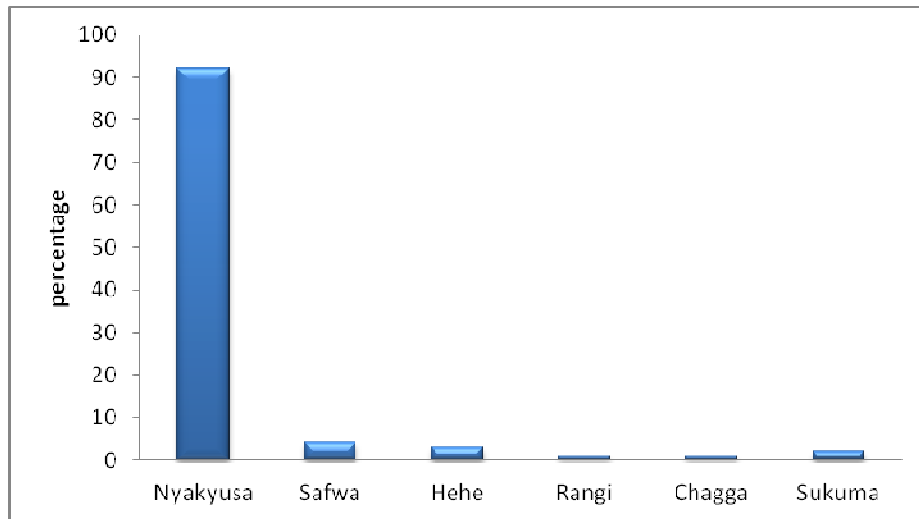
Religion of the Respondents	Frequency	Percent
Christian	145	97.3
Muslims	5	2.7
Others	0	0.0
Total	150	100.0

Source: Field data, 2015

4.2.6 Ethnicity of the Respondents

The study intended to assess ethnicity of the respondents in order to see if there was any influence from ethnicity in adoption of the ITNs. As presented in the figure 4.3, about 92 % of the respondents were Nyakyusa, while fewer were from other ethnicity such as 3% for Safwa, 2 % for Hehe, 0.6% for Rangi as well as Chagga. 0.8 % reported for Sukuma. As it was observed, the major ethnic group in Kyela District was Nyakyusa. These results comply with URT (2013) who reported that, Nyakyusa ethnic in the major and biggest ethnic in the district and the region at large. Thus it was not possible to measure the influence of ethnicity in adoption of the ITNs because there was one dominant tribe.

Figure 4.2: Ethnicity of the Respondents



Source: Field data, 2015

4.2.7 Occupation of the Respondents

The study intended to know the occupation of the respondents in order to know the economic status of the respondents and see its influence in adoption and use of ITNs. As presented in Table 4.5, the finding shows that 66 % of the surveyed respondents were farmers, followed by 20 % of the respondents who were formally employed, and 14 % of the respondents were self-employed. This shows that more than half of the respondents found in the study area were engaged in farming. This finding is in line with URT, (2014) reports that 70% - 80% of the Tanzania population dependents on agriculture as their major source of livelihood.

Table 4.6: Occupation of the respondents

Response	Frequency	Percent
Employed	30	20.0
Self-employed	21	14.0
Farmer	99	66.0
Total	150	100.0

Source: Field data, 2015

4.2.8 Type of the House Owned by Respondents

The study sought to know the type of the house owned by the respondents in order to measure their welfare and their level of affluence. The results observed that, 65.3 % of the respondents were living in the burnt bricks iron thatched houses, followed by 12.7 % of the respondents were living in mud walled grass thatched houses, also 8.7 % of the respondents were living in

the cement walled Iron thatched house, about 8% were living in mud walled iron thatched houses and only 5.3% of the respondents were observed living in burnt bricks grass thatched house. More than half of the respondents were observed to live in burnt bricks houses, as the burnt bricks were found to cheaper in the study area. The study observed that despite the respondents' houses being built by burnt bricks with iron roofing, but most of the houses had no windows and the doors were made with bamboo trees, and only few houses were having proper doors and windows. This indicated low level of affluence, and poor wellbeing of many respondents. Low level of affluence can be the factor hindering the ability to buy or own a net. In assessing factors influencing people's willingness to buy ITNs, Frehywot & Damaen (2011) and Ibrahim *et al* (2014) reported that poverty or low level of affluence is among the factor the affects individuals' ability to buy the nets.

Table 4.7: Housing characteristics of the respondent

Status	Frequency	Percentage
Mud walled grass thatched	19	12.7
Mud Walled iron thatched	12	8
Burnt bricks iron thatched	98	65.3
Total	150	100

Source: Field data, 2015

4.3 Knowledge and Attitude of the People Towards the Use of ITNs

Knowledge and understanding regarding the ITNs is the prominent feature towards the adoption of the ITNs (Tomass, Dejene & Kidane, 2011). To

understand households' knowledge and attitude towards the use of ITNs, various questions were posed to the respondents, and three variables were assessed such as people's feelings when using the ITNs, traditional and customs in relation to malaria and ITNs as well as opinions on negative experience or side effects caused by the use of ITNs in the study area.

4.3.1 People's Feelings When Using the ITNs

About 38 % reported that they feel normal when sleeping under the ITNs, 25 % said they feel good, and 33 % said they don't sleep under ITNs. And only 4 % of the respondents reported to feel bad. The study found that, a person's feeling when sleeping under the ITNs influences the use of ITNs. For example those who reported to feel bad or uneasy reported not to use the ITNs while those who reported to feel good and normal reported to sleep under the ITNs. Uneasy feeling after using ITNs makes people to stop using the ITNs. This study is similar to Zewden *et al* (2011) who reported that feeling good when sleeping under ITNs, influences people to keep on using the nets. Also Biadgilign *et al* (2013) reported that some people do not use the ITNs because they feel uncomfortable/ uneasy when sleeping under the nets.

Box 1. Feelings when sleeping under ITNs

Rebecca Mwakimi (23 years) old woman said about her feeling when sleeping under ITN

"I don't like to sleep under ITNs because I don't feel good when sleeping under the ITNs, it becomes so uneasy, I prefer not to use the net at all, I don't like to use nets"

Source: Field data, 2015

Table 4.8: People’s feelings when using the ITNs

Response	Frequency	Percentage
Good	37	25
Bad	6	4
Normal	58	38
I Don’t sleep under ITN	49	33
Total	150	100

Source: Field data, 2015

4.3.2 Traditions and Customs in Relation to Malaria and ITNs

In understanding if there were any traditional and customs relate to Malaria and the use of ITNs. Respondents were posed with the question if there any tradition and customs regarding the use of ITN in the study area. The results observed that 64.7 % of the respondents reported not to know anything concerning tradition and customs regarding using of ITN, while 35.3 % of the respondents reported “no” to the posed question. This picture reveals that there was no any tradition and customs which restricts people in using ITN in the study area.

Table 4.9: Traditions and customs in relation to malaria and ITNs

Response	Frequency	Percent
YES	0	0.0
NO	53	35.3
Don't know	97	64.7
Total	150	100.0

Source: Field data, 2015

Relationship between traditional and customs restricting using ITN and sleeping under ITNs

Basing on the findings, it was observed that there was no relationship which exists between the traditional and customs guiding the use of ITN or sleeping under ITNs. The results portrays that 43.3 % of respondents who reported not to know anything concerning traditional and customs guiding the use of ITNs were sleeping under ITNs, while to 37.7% of the respondents who reported “no” were using ITNs. This results was statistically insignificant at X^2 value of 0.437 and $P=0.508$. These results revealed insignificant relationship between tradition and customs with the use of ITNs. Because, there was no any traditions and customs about ITNs which were reported, and the respondents were found to use the ITNs regarding their understanding about the existence of traditions and customs about ITNs. Hence the community need to be supplied with ITNs because no traditional and customs exists which restricting them in using ITNs.

Table 4.10: Traditions and customs and use of ITNs

Are there any tradition and customs relating using ITN?	Sleeping under ITNs		Chi square Value	Sig.
	YES	NO		
NO	37.7%	62.3%	0.437 ^a	0.508
Don't know	43.3%	56.7%		

Source: Field data, 2015

Box 4.2 Traditions and customs about Malaria

Ogemo Isaka (48 years old) Man from Ngonga village explained about the traditions and customs about Malaria.

“I think there are no any traditions or taboos about ITNs and Malaria, however I remember back in the years people connected Malaria, with the witchcrafts. By then Malaria was connected with witchcrafts especially to the infant and children under 5, as you know severe Malaria comes along with high fever (degedege) thus when parents sees their little children with high fever they directly thought that their children were bewitched. But after the education and the increase awareness now-days people sees Malaria as just a normal disease which can be curable in the hospital. However I think still there are some people who go to witch doctors to get treatments for Malaria.

Source: Filed data, 2015

4.3.4 Negative Experiences or Side Effects Caused by the Use of ITNs

Respondents were asked about their experience in using the ITNs. Whereas more than half (64%) respondents reported to never been affected after sleeping under the ITNs, while 36% said they have experienced some effects after using the ITNs. As presented in the figure 4.3, the reported negative experience were as follows; about 38 % of the respondents reported to have skin itching, followed by 32 % of the respondents who reported to have skin irritation, 16 % reported to suffocate when sleeping under ITNs, and 9 % reported to feel dizzy when sleep under ITNs.

The results imply that the common negative experience of using ITNs among the people in the study area was skin itching. This result shows that there is a need for proper demonstrations on the use of the ITNs among the people in the communities in order to reduce this effects which sometimes might be caused by careless handling of the ITNs. This study resembles to the study conducted in South-West Ethiopia which reported that nearly 26% out of 264 respondents reported that they don't have trust with the ITNs, because they believe they got a lot of side effects and 21% of the respondents developed the dislike/hatred towards the ITNs and stopped using them due the reported side effects (Tesfa, 2010). Also these findings resembles with Chukwuocha *et al* (2010) who reported negative experience like rashes, headache due to strong smell, heat and suffocation, as the negative effects experienced with the respondents.

Box 4.3 Negative experience in Using ITNs.

Gwamaka William (28 years old) from Itunge village said about his experience in using ITNs

"It is too hot to sleep under the ITN; I can't handle to sleep in it, again when I sleep under I feel so uneasy, like I don't have enough air. To be honest I don't like to sleep under ITNs at all".

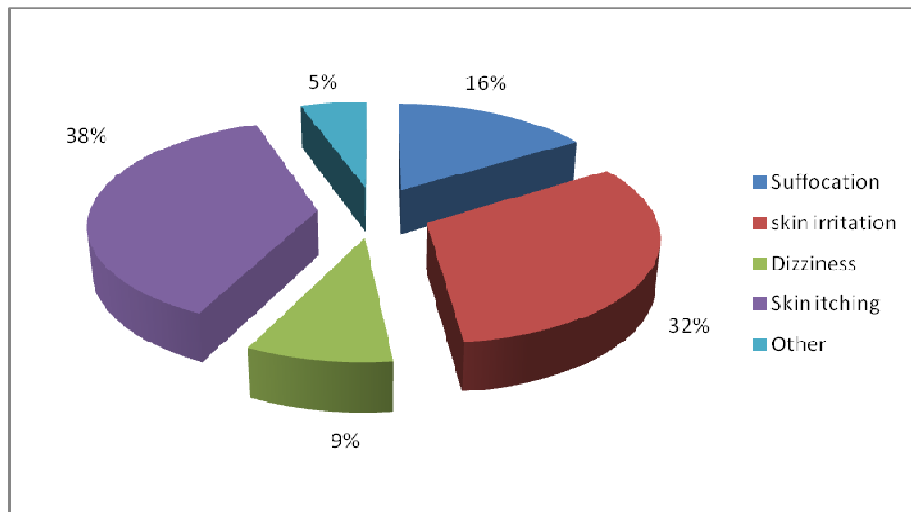
Bupe Mwakaje 35 years old woman from Itunge village said about her daughter's negative experience after sleeping under ITNs.

"The very first day my daughter slept under the ITN, she got skin irritation for continuously three days, after that incidence you will never convince her to sleep under the ITN again"

Source: Field data, 2015

The findings are also similar to Ibrahim *et al* (2010) who reported that the side effects of the ITNs have made many people to stop using the ITNs, where in his survey the reported negative experience were like hot, skin rashes and irritation, strong smell and suffocation. Udonwa *et al* (2010) also reported that, respondents in their study said the ITNs contain poisonous chemicals which causes headache and dizziness, and also poor ventilation when sleeping under ITNs. Zewden *et al* (2011) reported that about 35% of 368 respondents reported that there are side effects in using the ITNs. The reported side effects and misconceptions have been found to be the major factor which prohibits people from using the ITNs. Bhasin (2015) considered proper understanding of the product as the factor for adopt of the new product. So in order for the people to adopt and use the ITNs there is a need of giving them the proper understanding about the ITNs, and the proper demonstration on how to use them in order to reduce these reported negative experiences.

Figure 4.3: Negative experience or side effects caused by the use of ITNs in the study area



Source: Field data, 2015

4.3.5 Respondents' Attitudes About Using ITNs

Delacruz *et al* (2006) reported that attitude and beliefs are the influential factor in adoption of and use of the ITNs. In assessing the attitudes about ITNs, various questions were posed to the respondents. The negative responses in most cases indicated the negative attitude towards the ITNs. The study found that, nearly 40% of the respondents were not worried about using the ITN, while about 60 % were worried. This reveals that majority of the respondents were worried and feared using ITNs. The findings were similar to Chukwuocha *et al* (2010) who reported that nearly 60% of the respondents in their survey were worried in using the ITNs. These worries were mostly attributed with the reported negative effect and experiences over ITNs.

Further analysis was done in assessing respondents' opinions whether ITNs prevents Malaria or not. It was reported that, about 46.6 % of the respondents agreed that ITNs prevent the Malaria, while 32 % disagreed that ITNs prevents Malaria, and 21.4 % of the respondents were undecided on whether ITNs prevent the Malaria or not. Nwana (2010) reported that nearly 27% of the respondents in their survey reported they don't have trust if the ITNs prevent Malaria. Majority (nearly 60%) reported to have little knowledge regarding ITNs in the study area as they were observed to disagree and remain undecided regarding whether ITNs prevent Malaria. This resembles with Kariyaperimal (2009) and Bashinyora (2010), who found that little knowledge about ITNs, is the major factor which hinders people from using the ITNs. Tesfa (2012) also reported that out of 264 respondents, 21% reported that ITNs do not prevents Malaria, as they believe that someone can get Malaria even if they sleep under the ITN.

In addition, 52 % of the respondents reported not to prefer untreated nets over ITNs; while 48 % prefer using prefer using ITNs over untreated net. This shows that majority had bad attitude on using ITNs and that makes them not to prefer using them. Moreover it was observed that 60 % of the respondents prefer the freely distributed nets while 40 % prefer nets that have bought themselves. This indicates that, many respondents do not have faith in ITNs, thus they consider ITNs with bad attitudes. Thus there is a need for proper education to the people about the ITNs, as some respondents reported not to have faith on the ITNs, and the possible reason is that they don't have clear understanding and proper education about ITNs and its importance.

Table 4.11: Respondents attitudes about the use of ITNs

Variable	Response	Frequency	Percent
Are you worried of using ITNs?	Worried	58	38.7
	Not worried	92	61.7
Do you agree that ITNs prevents Malaria?	Agree	70	46.6
	Disagree	48	32.0
	Undecided	32	21.4
Do you prefer using ITNs than untreated net?	I prefer	72	48.0
	I don't prefer	78	52.0
Do you prefer the freely distributed nets or that you have bought yourself?	prefer the freely distributed	90	60.0
	prefer self bought nets	60	40.0

Source: Field data, 2015

The study found the knowledge gap about the ITNs among the respondents. Inadequate knowledge regarding ITNs, made people to perceive ITNs negatively, this was basically due to poor understanding and spreading rumours about the ITNs. This observation was similar to the study by Mazigo *et al*, (2010), in North West Africa, who found that many people do not have the genuine education of the importance of using ITNs, and many people perceived ITNs with negative attitudes. Also this study is similar to Singh, Brown, & Rogerson (2013) who assessed the ownership and use of ITNs during pregnancy in Sub-Saharan Africa, reported pessimistic attitude among the pregnant women towards the ITNs. It was reported that most pregnant women in Sub-Saharan Africa were reported to perceive the ITNs negatively and were not using the ITNs because they fear it could affect their unborn babies.

Box 3. Attitude about ITNs

Debora Nyimila 25 years old woman from Itunge village reported about the her attitude about ITNs

“Ah... I am not worried at all to use or sleep under the ITNs because I don't believe if the ITNs are having poison or any negative effects, because if it could be that way the government could have stopped their use them long time ago”.

Fadhila Ipyana (25 years old) from Ngonga village said that: *“I don't believe if the mosquito nets prevent Malaria, as I saw many people who uses the ITNs and still gets Malaria. So to me nets do not prevent Malaria, and I have heard that they are bad for our health”.*

Source: Filed data, 2015

The use of ITNs is the prominent tool in controlling Malaria in many developing countries. However, people were observed to have negative attitude regarding the use of ITNs in their households. This might be due to the inadequate education on the proper uses of ITNs. Improper use of ITNs causes them to contract Malaria even if they are using ITNs. The study found that the problem here could be that the respondents are not using ITNs properly. Thus the adequate knowledge on proper use of ITNs among the respondents may help to reduce the blames over ITNs as well as negative attitudes.

4.4 Household's Practices in Relation to Adoption of the ITNs

4.4.1 Ownership and Use of ITNs

It was found that 67.3% of the respondents were sleeping under ITNs, while 32.7% were not sleeping under ITNs. These results indicate that majority of the respondents in the study area were using ITNs. This is similar to the study conducted by Delacruz *et al* (2006), who discovered that many people do sleep under ITNs whereby out of 173 respondents, 86% of the respondents were sleeping under the ITN in their study. Also the results complies with the studies done by Singh *et al* (2013), Chukwuocha *et al* (2010), and Mutagonda (2012) who reported the increase use of ITNs among the respondents especially pregnant women and children under 5 years. The study found that the increase use of ITNs was attributed with campaigns and adverts in the Medias. Also these study observed that the free distribution of ITNs have made the increase use of ITNs among the people, as many people had access to ITNs even those who had no money to buy the nets got the free

nets. However, Nwana (2010) reported that, ownership of the ITN is one thing and utilisation is another thing. Many people reported to own the ITNs, but the percentage of utilisation was found to be very minimal (Mclean, 2014, Nwana, 2011, and Bashinyora, 2010). The minimal use of ITNs in the study area can be caused with little education on the importance of sleeping under the nets. As some people reported to own the nets but they were not using them. Proper education on the importance of sleeping under the nets will help to increase the proper use of the nets. Ownership of the nets should go along with the use of the nets. During nets distribution people are supposed to be educated on the importance of using the given nets.

Box 4. Ownership of the ITNs.

Lucina Mwakaje (43 years old) from Itunge village said about owning ITNs in her household.

“I have three ITNs in my house, but they are too old because I was given them in 2009 and 2011. Saying I have more than one ITNs does not mean that they all are in good state for being used, they are too old. We almost use only one, which my grandchildren are the one using it”.

Source: Field data, 2015

4.4.2 Views of the Respondents Regarding the Importance of Sleeping under the ITNs

The study assessed the views of the respondents regarding the importance of sleeping under the ITNs. Half of the respondents (50%) reported that it was important to sleep under the ITNs. While 34% reported that it was highly

important to sleep under ITNs and 16% reported that it was not important to sleep under ITNs.

About 86 % of the respondent reported that sleeping under ITNs reduces the risk of mosquito bite and acquiring Malaria, while 14 % of the respondents reported that it was safe to sleep under the ITNs. The results implies that majority of the respondents understand that it is important to sleep under the ITNs; however this still didn't made them all to use the ITNs. These finding resembles to Tesfa (2012) who observed that not knowing the importance of using ITNs was among the factor which makes people not to use the ITNs. Hence, there is a need of increasing education on the importance and advantages of sleeping under ITNs among the people, this will increase awareness and will make majority to choose sleeping under ITNs.

Table 4.12: Views on why it is important to sleep under ITNs in the study area (n=126)

Response	Frequency	Percentage
Reduce chance of getting Malaria	108	86
Reduces risk of mosquito bite	18	14
Total	126	100

Source: Field data, 2015

Box 5. Importance of Sleeping under the ITNs

Mary Isemba (25 years old) from Ngonga Village said about importance of sleeping under ITNs

"I think it is not important to sleep under the ITNs may be when someone is pregnant, otherwise it is not important that much, because Malaria is seasonal so how can you sleep under the net throughout, it is too hot anyway".

Mzee Mwafungo (52 years old) from Itunge village said;

"I would prefer to sleep under the ITNs only during rainy season where mosquito breeding is higher, so it is not important to sleep under the ITNs all the time".

Nelia Mpoki (26 years old- who is Health attendant) from Itunge Vilaage said;

"It is highly important to sleep under the ITNs because sleeping under the ITNs prevents Malaria and also other insects, I always advise people especially pregnant women to use ITNs always".

Source: Field data, 2015

The use of ITNs as reported by the respondents, it is important as it reduces chances of being beaten by mosquitoes and eventually contract malaria. However, the study observed inadequate knowledge about Malaria and its prevention as hindrance factor for the individual to realize the importance of using the ITNs. This is similar to the study conducted by Chukwuocha *et al* (2010) who reported that, lack of awareness and ignorance about ITNs, made people not to see how important is to sleep under the ITNs. Kariyaperumal &

Yesuf (2009) reported that adequate knowledge about the causes, affects and prevention of Malaria influences people to understand the importance of sleeping under the ITNs.

The study revealed that, there is a statistical significant between knowing the importance of sleeping under the ITNs and adoption or use of the nets as shown in table 4.13.

Table 4.13: Importance of sleeping under ITN and use of ITNs

Importance of sleeping under ITN	Using ITNs		Chi square Value	Sig.
	Yes	No		
Not important	48.3%	51.7%	6.238 ^a	0.044
Important	70.1%	29.9%		
Highly important	75.0%	25.0%		

Source: Field data, 2015

As shown in the table 4.17, it was found that 75 % of the respondents who reported there is high important to use ITNs, used the ITNs. While 70.1 % who reported it is important to sleep under ITNs used ITNs, and only 48.3 % of the respondents who reported there is no important of using ITNs were found using the ITNs. This was statistically significant at P=0.044 with at χ^2 value of 6.238 that knowing the importance of ITNs influences people to adopt using the ITNs. This picture reveals that, majority of the surveyed respondents use the ITNs because they do know the importance of using ITNs. Hence, knowing the importance of using ITNs was found to be the influential variable

in adoption of the ITNs. The education on the importance of ITNs needs to be thoroughly given to the people in order for them to use the nets. As in the process of controlling Malaria, it is so crucial for people to understand how important it is to sleep under the treated bed net to prevent mosquito bites.

4.4.3 Reasons for Not Sleeping Under the ITNs

The respondents gave out various reasons on why they don't sleep under ITN. About 37% the respondents reported that they do not sleep under ITN because they were afraid of the side effects, and nearly 33% reported they dislike the ITNs, 16% said they don't have the ITNs that is why they don't sleep under ITN, and 8% said they are not sleeping under ITNs because their husband don't like the ITNs and 8% said their ITNs were damaged/torn. This study is in agreement with Tesfa (2012) and Udonwa *et al* (2010), who found various factors which made people not sleep under the ITNs, like inadequate nets, disliking, torn nets and bored using them. But Biadgilign *et al* (2012) reported that some people are laggards, thus it becomes hard for them to opt for the changes like using the ITNs. Laggard people tend to live traditionally and hard to adopt new changes/ideas in the society (Boston University, 2013), thus it was reported that laggardness of some people is among the reasons for not using the ITNs (Biadgilign *et al*, 2012). This holds back the government's efforts to reduce the rate of Malaria in Tanzania by the use of ITNs. In order to make all people use the ITNs there is a need of deliberate efforts of making people understand and acknowledge the importance of using ITNs, and enlighten them on the consequences as well as economic burdens of Malaria from household to the family level.

Table 4.14: Reasons for not sleeping under the ITNs (N=49)

Response	Frequency	Percent
It was damaged	4	8
husband don't like the ITNs	4	8
Fear of the side effects	18	37
I don't have nets	8	16
I don't like ITNs	15	31

Source: Field data, 2015

Box 6. Reasons for not using the ITNs

Neema Lusajo (45 years old) from Ngonga Village said why she do not sleep under the ITNs

"We don't have enough ITNs in our home to accommodate all my family member, we have only two nets, one I am using with my husband and the other is used by small kids, the older kids do not sleep under the nets, because the nets are not enough for us all".

Also AtUganile Malema 21 years old from Itunge Village said;

"My husband and I normally don't use the ITNs, and also we don't have one".

Source: Field data, 2015

Basing on the above findings, it is clear that there are many factors which influence people not to use ITNs. The study conducted by Nwana (2010) reported that, ITNs non users reported factors like fear of side effects and cost

being the reasons for why they don't use the ITNs. Efforts should be made by the government and the communities to ensure that these factors affecting utilization of ITNs are given the solution.

4.4.4 Availability and Distribution of ITNs

The respondents were asked about the availability and distribution of ITNs in their villages. Where, 73 % of the respondents reported to get their nets through free distribution. While 21% got their nets by buying and 6% got their nets by being given by their relatives (Table 4.15). It is significant that reliable availability and distribution of the ITNs will increase the ownership of the nets among the people, thus will influence the use of the ITNs among the people in the communities. This study is similar to Mazigo et al (2010) who reported that the free net distribution helps people to have the ITNs in their homes. Free distribution of ITNs need to be advocated in order to make all people in the communities access the ITNs.

Further analysis on the affordability of the ITNs shows that 62 % of the respondent reported ITNs were expensive, while 21.3 % reported ITNs were averagely priced and only 16.7 % reported ITNs were cheaply and affordable (Table 4.15). With this kind of results it implies that ITNs are expensive to majority of the community who were observed to be low income earners, hence they failed to afford buying the nets, resulted toe neglect use ITNs. This finding is in agreement with Nwana (2010), Chamwali (2013), & Frehywot & Damen (2011), who reported that ITNs were expensive, as people reported cost of ITNs as the factor which hinders them from using the nets. THMIS (2012) reported that the free net distribution has stopped, and now the

government has introduced the new voucher system referred to as the Tanzania National Voucher Scheme (TNVS) or “*Hati Punguzo*” program, where people have to contribute some amount of money in exchange of the voucher for getting an ITN.

Moreover, Table 4.15 shows that 65.3 % of the respondents reported that there is bad supply of ITNs in the study area, followed by 18 % reported to have averagely supply of ITNs while only 16.7 % who reported good supply of ITNs. With these results it implies that poor supply of ITNs may influence the community from not using the ITNs. This study agrees with Ambrose *et al* (2011) who reported that free distribution of ITNs has resulted in substantial increase in net coverage. Bad or inadequate supply of the ITNs hinders the access of the ITNs to the people. And the government should ensure that the price of ITNs is friendly especially to poor people in both rural and urban areas. Therefore, factors like availability, price and distribution are important in ensuring access of the nets to the people.

Table 4.15: Availability and distribution of ITNs in Ngonga and Itunge villages

Variable	Response	Frequency	Percentage
How did you get your ITN(s)	By buying	31	21
	Free distribution	109	73
	Given by relatives	9	9
Affordability of the ITNs	Cheap/affordable	25	16.7
	Medium price	32	21.3
	Expensive	93	62.0
Supply of ITNs	Bad	98	65.3
	Good	25	16.7
	Average	27	18
	Excellent	0	0
Total		150	100

Source: Field data, 2015

Box 7. Availability of ITNs in the villages

Markison Mpembe (37 years old) Health attendant from Itunge village explained about availability of ITNs.

“The government program of distributing the nets to the people was helpful to most of the lower income people. Many of people benefited with the free distribution, Now the nets are no longer freely distributed, rather we are using Voucher System where people have to contribute some money in order to get a net”.

Source: Field data, 2015

Consistent availability and distribution of nets to the community is very important as it easy access of the nets to the community members. Also in this study it was reported that ITNs were expensive, this was found to be caused poor income /poverty among the majority respondents who reported to be unable to afford the prices of ITNs. Ibrahim *et al* (2014) reported that, poor income and poverty are among the causes of failure to adopt ITNs. In addition ITNs were noted to be unavailable in the study as respondents reported that the nets were not available in the residency area, and this was found to influence the community to neglect the use of ITNs. Thus, there is a need to ensure consistent availability of ITNs at least in each village especially in rural areas.

4.4.5 Other uses of ITNs in the study Area

The study observed unintended uses of the ITNs in the study area. The study found that apart from covering them while sleeping, nets were used in other unintended uses; it was observed that nets were used unintended purposes like covering vegetable gardens, covering chicken and ducks cages, also nets were used in fishing and in carrying harvests from farms, used for goal purpose, used to cover kiosks and also nets were used to cover the drying harvests. The findings were similar to the study conducted in Lake Tanganyika in Kigoma Tanzania by Mclean *et al* (2014) reported that over 87% of households surveyed have used a mosquito bed net for fishing at some point. The study found that in many developing countries nets are used in unintended purposely, and in the regions along the lakes, rivers and oceans many people uses the ITNs for illegal fishing. Unintended uses of nets

reduces the efforts of fighting Malaria, as instead of people using the nets in fighting Malaria, the nets are used differently as shown in the plates below.

Plate 4. 1: Net used as a “football goal”



Source: Field data, 2015

Plate 4. 2: Net used for covering “kiosk”



Source: Filed data, 2015

Plate 4. 3: Net used for covering harvests (palm tree fruits)



Source: Field data, 2015

Plate 4. 4: Net used for fishing in Lake Tanganyika, Kigoma-Tanzania



Source: Mclean *et al*, 2014

4.4.6 Challenges of Using the ITNs in the Study Area

Based on the study findings, it was reported that the existing myths challenged people, as they were not certain whether they should continue or drop using the ITNs. Nearly 50% of the respondents reported the myths as the major challenge, while 20% of respondents reported that the ITNs were not durable. And 13 % reported cost as the among the challenge with the ITNs, while 13% of respondents reported difficulty in hanging as their major challenge, similar to the study conducted by Tesfa (2012) reported that nearly 40% of the respondents can't hang their nets properly, thus they quit using them. The result implies that despite the importance of ITNs still there were challenges which in one way or another caused people to quit using ITNs. The study conducted in North East Nigeria, found various challenges reported by respondents in using the ITNs (Ibrahim *et al*, 2014). The reported challenges were like finance/cost, and the side effects. Other respondents reported that the freely distributed nets materials were not durable; the nets were easily torn and damaged, hence reduced the possibility of the nets to be used for a longer period of time. The study found that it was clear that the challenges may influence people not to use the nets. Thus the efforts should be made to reduce the reported challenges in improving the use of ITNs.

Table 4. 16: Challenges in using ITNs in the Study Area

Response	Frequency	Percentage
Can't hang properly	20	13
Not durable/damaged	30	20
The myths worries us	50	34
Others	8	5
Cost	20	13
No challenge	22	15
Total	150	100

Source: Field Data. 2015

Plate 4. 5: Challenges in hanging nets



Source: Field data

4.5 Factors Influencing Adoption of ITNs in the Study Area

With this aspect cross tabulation with Chi square was used to determine the existences relationship/significance between the hypothesised factors and the adoption to the ITNs in the study area. In regard to that, respondents' socio-demographic characteristics and specified factors were hypothesized to the

adoption of ITNs in the study area. Some of the hypothesized factors were age of the respondent, education level, marital status of the respondents, occupation, religions of the respondents, knowledge about ITNs importance of using ITNs, nature and type of sleeping items, availability and supply of ITNs, as well as misconception of using ITNs in the community, were hypothesised to influence adoption and using ITNs in the study area. The results are as follows;

4.5.1 Education Level of Respondent in Relation to adoption of ITNs

As shown in the Table 4.17, there is a significant relationship that exists between adoption /use of ITNs and levels of education at Chi square value of 7.634 and $P = 0.00$. These results are not surprising because, about 69.7 % and 50 % of respondent attended primary education in seven years and eight years reported to use ITNs, also 69.2 % of respondent with ordinary level of education and 58.3 % of respondent with advances level were also observed to use ITNs, while 77.8 % of respondent with vocational education and 66.7 % respondents who had certificates were reported to use ITNs. Also 70 % of respondents with use ITNs and while 100 % of the respondent attended four years primary education reported to use ITNs.

These results imply that those who have longer years in education have higher level of adoption to ITNs. However, the results show that primary education was also enough to enable the respondents to adopt the ITNs, as the fact that majority of the respondents attended seven years primary education. This implies that, the longer a person stays t school, it is expected

that his/her knowledge about different issues increases. Thus, people with higher level of education were most likely to have adequate knowledge and understanding about ITNs and Malaria prevention measures at large. As shown to the study area, respondents with higher level of education (example those with degree level or diploma) reported to use treated and untreated net or other mosquito repellents, and they never sleep without using any control measure for Malaria.

Table 4.17: Education level of respondent and adoption to ITNs

Education level of the respondent	adoption to the use of ITNs		X ²	Sig.
	YES	NO		
Primary education (4yrs)	100.0%	0.0%		
Primary education (7 yrs)	69.7%	30.3%		
Primary education(8yrs)	50.0%	50.0%		
Secondary education (4yrs)	69.2%	30.8%		
Not completed o-level secondary education	40.0%	60.0%	7.634	0.00
Secondary education (6yrs)	58.3%	41.7%		
Vocational education	77.8%	22.2%		
Certificate	66.7%	33.3%		
Informal education	60.0%	40.0%		
Diploma	70.0%	30.0%		
Degree	80.0%	20.0%		

Source: Field data. 2015

These results are similar to Nwana (2010) who reported there is a significant relationship between education and ITNs utilisation of ITNs at chi square

value of 1.703, with $P=0.01$. Also Mazigo *et al* (2010) reported that, education level and knowledge of ITNs were significance in taking preventive measures regarding the cause and effects of Malaria. Also the study conducted by Kessie *et al* (2014), reported that there is a significant relationship between the level of education and the knowledge and adoption of ITNs. Also it was reported that the longer years of schooling determines high level of knowledge and understanding about certain phenomena (Bhasin, 2015)

4.5.2 Age of respondents in Relation to adoption of ITNs

As presented in Table 4.18, the results show that there is significant relationship between the ages of respondent and the adoption to the use of ITNs at Chi square value of 13.598 and $P=0.004$. This was because it was reported that, 90 % of the respondents aged between 65 and above used ITNs, and 68.2 % of the respondents with the age between 30 and 44 years reported to use ITNs, followed by 61.1 % of respondent with the age between 45 and 64 years. But, only 45.2 % of the respondent with the age between 18 and 29 years reported to use the ITNs, meaning that more than half (nearly 55%) of respondents aged 18-29 were not using the ITNs.

This picture reveals that majority of the people aged between 30 and above were using the ITNs. These imply that older people have high adoption capacity to the ITNs compared to the young. These results can be this way because it was more likely that people with older age have high experiences and knowledge regarding various issues and they understand the impacts and consequences of Malaria especially its economic burden (Chamwali, 2013). Hence majority were noted to use ITNs in their houses to avoid the

consequences. This findings relates to the study conducted in Uganda, reported that age of the respondents have the role in ITNs utilization, as older individuals were reported to use the ITNs frequently compared to younger respondents (Nwana,2010). Hence, there is a need to educate young adults (18-29 years) about consequences of Malaria and the importance of preventing it through the use of ITNs

Table 4.18: Age of respondents and adoption to ITNs

Age of the Respondent	Adoption to the use of ITNs		Chi square value	Sig.
	YES	NO		
18-29	45.2%	54.8%		
30-44	68.2%	21.8%	13.598 ^a	0.004
45-64	61.1%	28.9%		
65+	90.0%	10.0%		

Source: Field data, 2015

4.5.3 Marital status of the respondents in Relation to adoption of ITNs

As shown in Table 4.19, this result shows significant relationship between marital status and sleeping under ITNs at X^2 value of 40.433 at significant level of $P=0.00$. The results appeared this way because 81 % of married respondents reported to sleep under ITNs compared to 62 % of the respondents who were divorced, followed by 57 % of respondents who are separated reported to sleep under ITNs, while 27 % of the respondent who

were single reported to sleep under ITNs, and only 21% of the widowed respondents were also observed to sleep under ITNs.

With this picture it implies that married people observed to sleep under ITNs, because they seemed to have high experiences compare to people who were single, also this was because people those who have family and those who have already had family have got enough experience and were more carefully about the issues of diseases compared to single individuals. This is similar to Mazigo *et al* (2010) who found that to marital status has influence in adoption of the ITNs while and it was reported that the use of nets among married women was higher compared to unmarried women. These results are also similarly to Ibrahim *et al* (2010) reported that married couples are more likely to adopt and use the ITNs compared to single individuals.

Table 4.19: Marital status of the respondents and adoption to ITNs

Marital status of the respondents	Adoption to the use of ITNs		Chi square value	Sig.
	YES	NO		
Single	21.9%	78.1%	40.433 ^a	0.000
Married	98.0%	2.0%		
Divorced	62.5%	37.5%		
Separate	54.2%	45.8 %		
Widowed	81.0%	19.0%		

Source: Field data. 2015

4.5.4 Knowledge and awareness About ITNs

The respondents were asked about their knowledge and awareness concerning ITNs. To assess their knowledge various questions were posed to the respondents and their responses determined their level of understanding. Most of the respondents (48%) had no knowledge concerning the Insect-side Treated Nets. About 28.7% of the respondents have got average knowledge concerning the ITNs while 11.3% of the respondents have got good knowledge about ITNs, and 12% of the respondents have got excellent knowledge concerning the ITNs most of them being the health attendants and experts.

Table 4.20: Knowledge and awareness about ITNs (Multiple responses)

Variable	Response	Frequency	Percentage
Heard of ITNs?	Yes	124	82.7
	No	26	17.3
Source of information about ITNs	Home	8	5.3
	Radio programs	60	40
	Hospital/dispensaries	41	27.3
	Health workers	5	3
	After suffering from	33	22
	Malaria	3	2
How did u become aware about ITNs?	Others		
	Heard from hospital	49	32.7
	After affected being by Malaria	48	32
	Heard from medias	50	33.3
	Other	3	2

Source: Field data, 2015

Table 4.20 shows the reported knowledge/awareness concerning the ITNs in the villages. The results show that, nearly 83% of the respondents have heard about the ITNs, but fewer (17%) have not heard about ITNs. This indicates that there are some people who still have not heard about the ITNs, and this made them not to put much weight on using ITNs. The results show that Media i.e. Radios and TVs play a great role in giving out the information and education about the ITNs. This is similar to Biadgilign *et al* (2012) and Bashinyora (2010) in their surveys reported the media was the major sources of information about ITNs. In the study, about 40% of the respondents reported radios as their source of information/education about ITNs while 27.3% got the information from the hospital, 22% of the respondents got the information after been affected by Malaria, and 5.3% got the information from home while 2% got the information from other sources. Also about 32.7 % of the respondents became aware of the ITNs by hearing and being told in the hospital, while 32% became aware by hearing from the media broadcasts, also 32% became aware after being affected with Malaria when they were pregnant and the 2% percent became aware after hearing from other various sources.

The study shows that respondents have got the average knowledge about the ITNs and still more efforts are needed to create increase awareness about ITNs among the people especially in rural areas. Delacruz *et al* (2006) reported that communities' inadequate knowledge about the ITNs acts as a barrier to the use of ITNs. However, Mutogonda, (2012) reported that there is an increase awareness in urban areas compared to rural areas, it was

reported that this was attributed much with the media broadcasts which are much considerable in urban areas compared to rural areas.

Box 4.9. Awareness about the ITNs

Neema Kalinga (34 years old) from Ngonga village said about her awareness on ITNs

“I only sleep under the ITNs when I am pregnant because when attending the Antenatal Care (ACT), they told me I must sleep under the ITNs, but after I gave birth I see no reason of continuing to sleep under the net”.

Reported a respondent from Ngonga village

Samuel William (46 years old) from Itunge village explained about his awareness on ITNs

“I have heard about “Ngao” (the treated nets) in the radios and hospital, I am not sure of what it is and how it works, my child is the one sleeping under those nets, I think it is important for pregnant women and children to sleep under those nets”.

Source: Filed data, 2015

Bhasin (2015) reported that in adoption of any new product or idea, knowledge regarding that particular product is crucial. Based on the finding it was observed that there is significant relationship which exists between the knowledge about ITNs and adoption to the use of ITNs at the Chi square value of 18.688, and significance level of $P=0.05$. The results show that people with excellent knowledge tend to use ITNs, as 89.2% reported to use the ITNs compared to others, followed by 77.8% who reported to have

good knowledge uses the ITNs, and 60.5 % with average knowledge were using of ITNs, while those with none knowledge only 32.4 % reported to use the ITNs. With these results it is revealed that knowledge on the importance of using ITNs makes people use ITNs. Therefore, the government and its partners have to ensure that people are given adequate knowledge about the ITNs to clear the doubts and improve the use of the ITNs. Knowledge can be provided through the media and village meetings and at the hospitals or dispensaries. Also banners can be spread to people and help increase awareness.

Table 4.21: Knowledge about ITNs and adoption to the ITNs

Knowledge about ITNs	Adoption to the use of ITNs		Chi square Value	Sig.
	YES	NO		
None	28.2%	71.8%		
Good	38.9%	61.1%	18.688 ^a	0.051
Average	46.5%	53.5%		
Excellent	83.3%	16.7%		

Source: Field data, 2015

4.5.6 Occupation of respondents in Relation to adoption of ITNs

Table 4.21, shows a significant relationship between occupation of the respondents and adoption to use of ITNs at X^2 value of 1.702. The study found that, 82% of the employed respondent reported to own ITNs, and 78% of respondents who were self employed also reported to own ITNs, while 74%

of the respondent who were farmers reported to own ITNs. With these results imply that occupation of the respondents was not the determining factors of whether owning ITNs or not in the study area. Majority of the respondents reported to have ITNs regardless of their occupation or economic status. These findings were dissimilar with Ambrose *et al* (2012), Biadgilign *et al* (2012) and Frehywot &Damen (2011) who reported that occupation or economic status of individuals has got influence in adoption and using ITNs. Because in those studies it was found that individual with high income have the economic access to ITNs compared to individual with poor or little income. The findings were dissimilar because this study conducted in Kyela district ITNs were previously distributed by free of charge, thus all people regardless employed or unemployed or with high or little income were both given the free nets, hence income of the respondents did not guarantee the ownership of the ITNs, while in other studies the ITNs were obtained by the means of buying. Hence, free distribution of ITNs was found to be important as it helps people to own nets regardless of their economic status.

Table 4.22: Occupation of respondents and adoption of the use of ITNs

Occupation of respondents	adoption of the use of ITNs		Chi square Value	Sig.
	Yes	NO		
	Employed	90 %	10 %	1.702
Self employed	69.1 %	31.9 %		
Farmers	68%	32 %		

Source: Field data, 2015

4.5.8 Relationship Between the Nature and type of Sleeping Items and Adoption of ITNs

As shown in the Table 4.24, there is a significant relationship between the places or item used by the respondents during sleeping and use of ITNs. The study found that, the use of ITNs was very minimal to the respondents who slept on the locally made mats. Only 27 % of the respondents who sleep on mats reported to use the ITN. Compared to 75 % and 69 % of those who said they sleep on mattress or mattress without bed reported to use the ITNs. The study found a significant relationship of χ^2 value of 6.337 with significance level of $P=0.054$. The study found that those who slept on mats reported hardship in hanging the nets, thus the government should find ways of ensuring that the nets are made to fit in all kinds of sleeping items being it a bed or a mat. The nets should be made in various sizes and not free size as always.

Table 4.23: Nature and type of sleeping items and the use of ITNs

Nature and type of sleeping items	Use of ITNs		Chi square Value	Sig.
	Yes	No		
Bed with Mattress	75.0%	25.0%	6.337 ^a	0.054
Mattress alone	69.1%	30.9%		
Locally made mat	27.3%	72.7%		

Source: Field data, 2015

4.5.10 Religion of the respondents and adoption of ITNs

The analysis shows that there is no significant relationship between religion of the respondent and adoption to ITNs at ($X^2=0.110$, $P=0.740$). The results was observed this way due to the difference in percentages presented by Muslims to adapt to the use of ITNs was 75.0% compared to Christian which was 67.1%. This picture portray that been a Christian or Muslim does not influence the respondents to use or not use the ITNs in the study area, and the study area was dominate with one religion (Christian) thus it was hard to determine the influence of religion in using ITNs without being biased. Hence the results were statistically insignificant. This study is in agreement with Kessie *et al* (2014) who reported that there is no statistical significant variation between ITNs utilisation and religious affiliation.

Table 4.24: Religion of the respondent and adoption to ITNs

Religion of the respondent	Adoption to ITNs		Chi square Value	Sig.
	YES	NO		
Christian	67.1%	32.9%	0.110	0.740
Muslim	75.0%	25.0%		

Source: Field data, 2015

4.5.11 Myths and Misconception about ITNs

The study intended to assess the myths and misconceptions about ITNs and see if it has influence in using or not using them. Majority of the respondents (more than 70%) reported that that there were various myths concerning the ITNs, while 15% respondents said there were no any myths, while 13% respondents said they don't know. The common myth reported more half of respondents (56%) associated ITNs with Male Erectile Dysfunction (MED). The study found that the existing myths worry people to use the ITNs. The study conducted in South-West Ethiopia reported that nearly 26% out of 264 respondents reported that they don't have trust with the ITNs, because they heard that they got a lot of side effects when using them and 21% of the respondents developed the dislike/hatred towards the ITNs due the reported myths (Tesfa, 2010).

Table 4.25: Myths related to ITNs

Variable	Response	Frequency	Percentage
Are there Myths about ITNs?	Yes	108	72
	No	22	15
	I don't know	20	13
What are the Myths (n=108)	Causes MED	60	56
	ITNs contain	21	19
	poison	18	17
	Brought to reduce population in Africa	9	8
	ITNs have side effects		

Source: Field data, 2015

Apart from associating the ITNs with male dysfunctional, other reported myths were like ITNs contains poison (19%), while 17% respondents reported they have heard that ITNs are brought to Africa to reduce the population, thus by using the ITNs people will not be able to conceive and bear child. And 8% reported that the ITNs are just having the side effects like any other drugs. The study conducted at Imo river basin Nigeria, reported that people perceived ITNs as having the harmful poisonous chemicals which are used to treat them (Chukwuocha *et al*, 2010). The study reveals that that myths made pregnant women to stop using the ITNs fearing the chemicals could kill their unborn babies. Ibrahim *et al*, (2014) in the report about utilisation of ITNs by pregnant women in North-East Nigeria, reported that the existing myths convey fear to the people to continue using the ITNs.

Also another study conducted in coastal communities in Nigeria, reported that that out of 400 respondents nearly 30% reported that they do not use the ITNs because they believe that the ITNs are poisonous as contain poisonous chemicals, and due to this myth they refuses to use the ITNs (Udonwa *et al*, 2010). Another study conducted in Uganda, reported that people believed that the ITNs have got toxic chemical which may cause impotence to men (Nwana, 2010).

Table 4.26: Myths about ITNs and use of ITNs

Are there myths concerning using ITNs?	adoption to ITNs		Chi square Value	Sig.
	YES	NO		
	YES	62.4%	37.6%	2.746 ^a
NO	75.4%	24.6%		

Source: Field data, 2015

The study observed that, 75.4% of the respondents who reported there are no myths, were observed to use of ITNs and about 62.4% of the respondents who reported the misconception of ITNs and they were observed to use the ITNs. The study found no statistical significant at chi square level of 2.746, and significance of P=0.098. This finding implies that, despite the existing myths and misconception people still continues to use the ITN. However, to some extent the existing myths and misconception makes many people to fear using the ITNs. This resembles to Nwana (2010) who reported that the misconceptions were barrier to use the ITNs, as many people rejected the ITNs because of the misconceptions and myths.

Box 4.10. Myths related to ITNs

Jones Mwakalinga (35 years old) from Itunge village said about the ITNs myths and his worries.

“I would not risk my life by sleeping under the ITN. I am worried. They say this nets causes impotence, also are made with chemical which are harmful thus I see it is dangerous to use them”

Source: Field data, 2015

The myths and misconception has been found to be the major factor influencing people not to use the ITNs. This myths and misconception are to be addressed so that people should eliminate them and continue the use of ITNs in preventing Malaria and support the efforts made by the government in reducing Malaria, and also fulfilling the Millennium goal number 6 which intends to combat Malaria. Therefore, the important measure to take in expelling the existing myths is by giving people clear education about ITNs. And make sure that all the existing myths are cleared to avoid confusions which made people to stop using the ITNs.

4.6 Chapter summary

The chapter above provided the critical discussion of the research results. Whereby various socio-economic and demographic data were discussed and then cross- tabulated to analyse its influence in adoption of the ITNs. The following chapter will give the summary of the study, as well as conclusion and recommendations and areas for further research.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Overview

This chapter gives a summary of the study, conclusion and recommendations from the study. In this chapter the conclusion was drawn based on the objectives of the study and the recommendations given will be based for the policy, practice and future researches.

5.2 Summary

This study intended to assess knowledge, attitudes and practices on Insecticide Treated bednets in controlling Malaria in Itunge and Ngonga villages of Kyela district. The study found that ownership of the ITNs among the respondents in the study area increased after the government programme of free net distribution among the people. However it was clearly found that the proper use of the nets was low. People were found to use the nets in unintended manner. The study found inadequate knowledge about ITNs among the respondents in the study area. Many people were found to have little knowledge about ITNs and hence pay little attention on using them.

Also the study reveals poor or bad attitudes towards the ITNs among the people in the study area. Negative attitudes were mostly caused with misconception and misinformation about the ITNs. Negative attitude made people to stop or to ignore using ITNs. Also the study observed poor practices of the nets, whereby people in the study area were found to use the sleeping bednets. Example nets were used for carrying harvests, covering vegetable gardens and other unintended uses

5.3 Conclusion

Generally, the study found that bad attitude and poor practices of ITNs were mostly caused by inadequate knowledge about the ITNs and little understanding. Also the study found that the existing myths and misperception about the ITNs were among the reasons for poor attitude and bad practices over ITNs. Myths and misperception/rumours influenced people to stop using the ITNs. Also the study revealed various bad practices of the ITNs in the study area, and also the study found various factors influences the use of ITNs to the people in the study area. Factors identified were like availability and distribution of ITNs, price of the nets, knowledge about ITNs, marital status and also education level. The adoption theory suggest that in order for the individuals to adopt new product or idea good knowledge and attitude as well as proper understanding of that particular product is fundamental. This means that in order to ensure many people adopts and use the ITNs, there is a need to give them education and good knowledge to improve their understanding about ITNs and its important as well as they have to change their attitudes towards the ITNs.

5.3 Recommendations

In respect of the findings of this study, the following are the recommendations in order to improve the situation;

- 1) The government through the responsible Ministry of Health (MoH), should create a comprehensive policy for Malaria. Also the ministry of health should create Malaria control projects which will also ensure the distribution of free ITNs to the poor households especially in rural areas. And also the distribution should consider the number of the people in the households.

- 2) The ministry of health at the local government level, through the hospital and dispensaries should increase the effort of educating people about the importance of ITNs and clear all the misconception and myths about the ITNs. As it was found that respondents who were not using the ITNs their major worries were the myths and misconception about the ITNs, thus the local governments should devote the efforts in clearing the misconceptions which hinders them in using the ITNs. Also the all the challenges concerning the supply of the ITNs are tackled. Also the Voucher system or "*Hati Punguzo*" should be upgraded to reach people of all cadres in the communities.
- 3) For proper practices of the ITNs, the communities need to change their attitude towards the ITNs. The communities have to be aware about Malaria, its causes and control measures. More education should be given to the communities for them to change their attitudes and practices towards the ITNs. And also advocacy on environment cleanliness should be increased to avoid possible environment for mosquito breeding, also the use of residual sprays should be encouraged to the areas with chronic mosquito breeding.

5.4 Areas for further Research

The study suggests that, there is a need for further study on the intra-household factors influencing adoption of the ITNs. There is a need to conduct this kind of survey because, there is need to have a clear understanding if there are any factors within the households which may influence the adoption of the ITNs.

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APPENDICES

Appendix I: Questionnaire

Respondent No.....

Name of the village

SECTION A: (Please tick (√) at the correct answer)

1. Sex:

- i) Male ()
- ii) Female ()

2. Age

- i) 8-29 ()
- ii) 30-44 ()
- iii) 45-65 ()
- iv) More than 65 ()

2. Marital status

- i) Single ()
- ii) Married ()
- iii) Divorced ()
- iv) Separated ()
- v) Widowed ()

3. Please tell us, what is your educational level? Please tick at the correct answer

- i) None ()
- ii) Primary education (4 yrs) ()
- iii) Primary education (7 years) ()
- iv) Primary (education 8 yrs) ()
- v) Secondary education (O Level- 4 years) ()

- vi) Secondary education (A Level 6 yrs) ()
- vii) Vocational education ()
- viii) Certificate ()
- ix) Diploma ()
- x) Degree level ()

4. Occupation

- i) Formal Employed ()
- ii) Informal employed ()
- iii) Farmer ()
- iv) Non-employed ()

5. Religion

- i) Christian ()
- ii) Muslim ()
- iii) Non believer ()
- iv) Other ()

6. Ethnicity.....

7. Type of the house

- i) Mud walled grass thatched ()
- ii) Mud walled iron thatched ()
- iii) Burnt bricks grass thatched ()
- iv) Burnt bricks iron thatched ()
- v) Cement walled iron thatched ()

Section B: knowledge, Attitude and Practices concerning the Insect-side Treated Net

9. Do you have an ITN(s) in your house?

- i) Yes ()
- ii) No ()

10. How many ITNs do you have in your household?

- i) Only one ()
- ii) More than one ()

11. Do you sleep under the ITN

- i) Yes ()
- ii) No ()

12. If NO please explain why

.....
.....
.....

13. Do you see any importance of sleeping under ITN?

- i) Not important ()
- ii) Important ()
- iii) Highly important ()

14. On the above question please explain why.

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15. What is the price of an ITN?

- i) Affordable ()
- ii) Expensive ()
- iii) Medium price ()

16. Availability and supply of ITNs in the village?

- i) Bad ()
- ii) Good ()
- iii) Average ()
- iv) Excellent ()

17. Where do you sleep on?

- i) On a spongy mattress only ()
- ii) On a locally made mat ()
- iii) On a bed with a spongy mattress ()

18. Where did you get the education on the importance of sleeping under ITN?

- i)
- ii)
- iii)

19. How do you use the ITN?

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20. How did you become aware on the use of ITNs?

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21. Are you worried to sleep under ITNs?

- i) Worried ()
- ii) Not worried ()

22. Do you agree that ITNs prevent Malaria?

- i) Agree ()
- ii) Disagree ()
- iii) Undecided ()

23. Do you prefer using ITNs than untreated nets?

- i) I prefer ()
- ii) I don't Prefer ()

24. Do you prefer free distributed or self bought nets?

- i) I prefer free distributed nets ()
- ii) I prefer self bought nets ()

25. How do you get the ITNs?

- i) By buying ()
- ii) Freely distribution ()
- iii) Other.....

26. Have you ever been affected by sleeping under the ITN?

- i) Never affected ()
- ii) Affected ()

27. If affected, please explain how.

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28. Other uses of the ITNs?

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29. How do you feel when sleeping under ITN?

- i) Good ()
- ii) Bad ()
- iii) Normal ()

30. Are there any traditions and customs relates to the ITNs?

- i) Yes ()
- ii) No ()

31. If YES, what are they?

- i)
- ii)
- iii)
- iv)

32. What are the taboos related to the use of ITNs?

- i)
- ii)
- iii)
- iv)

33. What are the challenges in using the ITNs?

- i)
- ii)
- iii)
- iv)

34. What are the challenges in the supply of ITNs?

- i)
- ii)
- iii)
- iv)

Appendix II: Check-list for focus group discussion

- 1) Knowledge concerning the ITNs
- 2) The uses of ITNs
- 3) Taboos and customs regarding using the ITNs
- 4) Myths concerning Malaria AND ITNs
- 5) Challenges regarding the use of ITNs
- 6) Availability of ITNs
- 7) Supply and distribution of ITNs
- 8) Price and distribution of ITNs