UTILISATION OF INSECTICIDE TREATED NETS IN HOUSEHOLDS WITH CHILDREN UNDER FIVE YEARS OF AGE IN NORTHERN DIVISION, MBALE

DISTRICT, UGANDA

BY

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DECLARATION

I MWANIKA ABUBAKAR, REG NO; 1164-05194-09195 hereby declare that the work presented in this research is original and that no study of this kind has ever been submitted for the award of a degree in any university except the few references used of which acknowledgement has been duly made.

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APPROVAL

This is to certify that this work has been done under my supervision and guidance. It is now ready for submission and examination as the University supervisor.

. Signature...

MS.NAKAWUNGU FARIDAH

Date 14691 2000

DEDICATION

This research is dedicated to my mother NABUDUWA MADINA, my father MWANIKA YAHAYA and my caring sister SARAH LOGOSE for their love and support during my studies. Mummy, Hassan, Mercy and Sarah this work is yours.

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LIST OF ABBREVIATIONS AND ACRONYMS

ITNs: Insecticide Treated Nets

OPD: Out Patients Department

PMI: Presidents' Malaria Initiative.

AMREF: African Medical and Research Foundation.

CDC: Center for Disease Control

FGD: Focused Group Discussion

MCP: Malaria Control Program.

MOH: Ministry Of Health.

NGOs: Non Government Organizations.

UNICEF: United Nations Children's Fund

WHO: World Health Organization

RBM: Roll Back Malaria.

ABSTRACT

Malaria is a major cause of morbidity and mortality worldwide and it mostly affects pregnant women and children under five years of age. It is among the leading cause of deaths in the under fives. This study therefore investigated the intra-household factors a monger care takers that influence use of ITNs by under fives in northern sub-county Mbale municipality in Uganda, in order to find answers to the following objectives: To establish the respondents' knowledge, attitude, perception and beliefs towards the use of ITNs among the under fives; To establish the respondents' knowledge about Malaria and ITNs and to establish the relationship between intra-household factors and ITN utilization among respondents with children under five years of age.

Across section study was conducted in order to get a quick picture of the factors affecting ITN utilization in the under fives in Northern sub-county. The study sampled 248 households from a targeted population of 700 households. Data was collected from 164 respondents using a structured questionnaire and interview guides. The interview guide was divided into Social-demographic characteristics, intra-household factors and affordability.

The findings of the study revealed a low level of ITN utilization among the under fives with average mean=2.6, there was a medium level of intra-household factors affecting ITN utilization among the under fives with (General mean=3.25). In reference to number of ITN versus Family size, the least number of ITN to be owned was 1 and the highest was 8 with majority 55(33.5%) of the respondents owning at least one net, 43(26.2%) of the respondents had owned two ITNs and just 1(0.6%) of the respondents had gotten 7 and 8 ITNs.44(26.83\%) had 5below children of less than five, 81(49.39%) had between 5-10 children and 39(23.78%) had over 10 children.

The regression results showed that knowledge, beliefs, attitude and perception of care takers significantly affected use of ITNs among the under fives with (F-value 5.188> P-value0.001) hence rejecting the null hypothesis.

The study concludes that these intra-household factors hinder use of ITNs by children under five years and therefore presence of an ITN in a household may not guarantee utilization.

The study recommends that efforts be made to increase awareness on the importance of ensuring children less than five years sleep under an ITN if reduction in morbidity and mortality in this age group is to be reduced.

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CHAPTER ONE.

1.0 Introduction

This chapter presents the background of the study, which is systematically constituted of the historical, theoretical, conceptual and contextual Perspectives. It also presents the problem statement, purpose of the study, specific objectives, research questions, Hypothesis, scope of the study and significance of the study.

1.1 Background of the study.

Malaria is a leading cause of morbidity and motility worldwide especially in pregnant women and young children, particularly Tropical Africa where at least 90% of malaria deaths occur (WHO 2016). More than three quotas of global malaria deaths occur in under five children living in various countries in sub-Sahara Africa (WHO 2003).Where 25% of all childhood mortality bellow the age of five (about 303,000 young children is attributed to malaria: WHO 2016 World Malaria Report). The malaria mortality rate among the under 5 fell by an estimated 35%. Nevertheless, malaria remains a major killer of under-five, claiming the life of 1 child every two minutes

1.1.1 Historical Perspective.

In Uganda, malaria accounts for 25-40% of all outpatient visits at health care facilities up to 20% of hospital admissions and over 27% of in-patient deaths are due to malaria (MOH 2016). About (30-40) % of all fevers seen in health centers in Africa are due to malaria with huge seasonal variability between rainy and dry seasons (NMCP 2012). Hospital records suggest that Malaria is responsible for 30 to 50 percent of outpatient's visits, 15 to 20 percent deaths (UMCP, 2014). Of the eighteen countries that account for 90 percent of P. falciparum infections in sub-Sahara Africa, Uganda ranks third in the total number of infections after the Democratic Republic of the Congo and Nigeria (WHO 2014a). Statistically, from the Ministry of health (MOH) malaria accounts for over 27% deaths and Uganda has the worlds' highest Malaria incidence with a rate of 478 cases per1000 population per year

One of the most effective tools for malaria prevention is the insecticide treated mosquito net (ITN).Consistent use of ITNs can reduce Malaria transmission by up to 90%(Gemming et-al 2003) and over as much as 44% of all cause mortality among children under five (Lengelar 2002) with use of ITNs, an overall reduction in child mortality could be demonstrated with 6 lives saved per every a 1000 children protected. There is evidence that if 80% of households

in an area sleep under an ITN, malaria transmission will be significantly reduced which can benefit people who use nets themselves (CDC 2008).

1.1.2 Theoretical Perspective.

In the struggle to attain the vision of a "Malaria Free Uganda", the government of Uganda through the Ministry of health (MOH) have recently increased in attention, funding and political will to improve Malaria control and prevention with a focus on achieving the SDGs and the Abuja and Global Malaria elimination targets. The MOH through its National Malaria Control Strategic Plan (2010/11-2014/15) approach to ensure maximum impact on Malaria focuses on the integration of the most effective prevention and treatment tools. Both indoor residual spraying of insecticide and large-scale use of long-lasting insecticide treated nets should be promoted to have the most rapid and sizable impact on the transmission of malaria.

1.1.3 Conceptual perspective.

This study was intra-house hold behaviors that is; knowledge, attitude, perception and believes of respondents with children under five years. Behavior in its self refers to the way in which one acts or conducts oneself, especially towards others. In regard to this study, intra house hold behaviors are the way(s) in which house hold members with children below 5 years conduct themselves towards these children with regard to use and non use of ITNs.

Perception is the way in which some thing is regarded, understood or interpreted. Operationally this study used the variable perception in order to find out the care takers' level of understanding about the use and non use of ITNs different from other forms of nets. Attitude is a settled way of thinking or feeling about something, for this matter therefore, this study was to explore the respondents' feeling about the use of ITNs among the under 5 children in their households. Affordability is the state of being cheap enough for people to be able to buy, with reference to this study, I wished to find out the extent to which ITNs are affordable to households with children under 5 as a measure of their cost relative to the mount that the purchaser is able to pay. Knowledge according to the dictionary refers to the facts, information and skills acquired through experience or education. The study therefore wished to find out the caretakers' information, experience and familiarity about ITNs and their general use and how they prevent their children from Malaria vectors.

A simple mosquito Net treated with any insecticide is approved and cost effective way to repel or kill mosquitoes carrying the parasite that causes Malaria. Deeping Nets in a solution of parathyroid insecticide transforms the net from a simple physical barrier into a physical and chemical barrier that can repel or kill the female anopheles mosquito which is

responsible transmitting malaria parasites. Parathyroid insecticides are effective for up to 12 months, after which the net should be re-treated. While the evidence based on the effectiveness of ITNs in most African countries have noted that 90% of mortality is due to malaria (WHO 2016).Malaria continues to be a leading cause of death among the under fives despite various interventions to control it.

1.1.4 Contextual Perspective.

Increased national and international funds have boosted the deployment of insecticide treated nets (ITNs). A bout half of African countries have waived taxes and tariffs on nets, netting material and insecticides. Since 2002, African countries started scaling up free of charge or highly subsidized provision of mosquito nets for under five years and pregnant women in rural areas. As a result there has been a substantial increase in mosquito net coverage in African countries (UNICEF 2005). In Uganda one in four households have at least one net and 12 percent own more than one. The proportion of households with at least a net doubled from (16-47)% in 2006-2009 to (60-90)% in 2011-2014/15 (Uganda Malaria Survey 2014/15). The proportion of children less than five years sleeping under a mosquito net the previous night was at (10-33)% in 2006-2009 and (43-74)% in 2011-2014/15(Uganda Malaria Survey 2014/15).

However, some studies have indicated low utilization of ITNs among children of less than five years old. There is a wide gap between net possession and use. Whereas the targets set by the government is to ensure children under five years access and sleep under insecticide treated nets (WHO 2003),Use by vulnerable groups requires that a household own a net and that the most vulnerable groups be given the priority for sleeping under the nets usage seems to be affected by intra-household factors such as the extent to which nets are used at all , decision making in regard to who should sleep under an insecticide treated net and who actually uses the net. Given the fact that malaria in Uganda continues to be a major cause of child mortality and morbidity yet ITNs have been made accessible to the population, it is upon this background that this study explored the intra-household factors that affect net utilization in Mbale District Northern division with the view of reducing child mortality and morbidity due to malaria.

1.2 Statement of the problem

Insecticide treated nets are the most powerful Malaria control tool to be developed and as such there have been an important component of global and national Malaria control polices since mid 1990s.Yet up to date utilization is still unacceptably low. Only (9-8) percent of

African children are currently sleeping under an ITN (AK Mlanye) and about 20% are sleeping under any kind of net (oresanya et al 2008).Worse still Malaria continues to be the leading course of child mortality and morbidity in spite of Government, NGOs and the private sector intervention to ensure that the children under five, who are most vulnerable to access, own and sleep under ITNs.

Northern division is one of those Sub-counties where ITN distribution was done in 2016 to ensure that the most vulnerable groups access, own and sleep under ITNs. However records from the Sub-county Health Center IV show that Malaria mortality in children under five years does not collate with ITN ownership. According to the records Malaria accounts for about 38% of all Outpatients (OPD) attendance and 30% of all hospital admissions. With 35% of deaths in children below the age of five years and is still a significant cause of adult morbidity. Such a situation if not well dealt with is a leading cause of workdays lost in adults due to illness, it directly contributes to reduced school attendance and low productivity hence impacts on economic development

Utilizations of ITNs by less than five require that households own nets. Whereas programs to ensure children access ITNs have been vigorous, utilization rates seem not to be a mirror of ownership rates. Expanded ownership of ITNs can only make a substantial reduction in malaria mortality only if the nets are used properly by under fives. But to what extent are the nets which are owned actually used? If a house owns a net, which household members sleep under a net and what are the most common groupings under a net? What happens to these patterns when a family acquires more than one net? There seemed to be unanswered questions which this study sought to provide. Several studies on nets among the children under five concentrate on effectiveness of ITNs in malaria control, accessibility, availability and ownership of ITNs; no study has been done to investigate the intra-household factors that affect the utilization of ITNs in households with children less than five years which this study sought to investigate

1.3 Objective of the study

The general objective of this study is to examine the intra-household factors that affect the utilization of ITNs in households among the under fives.

1.3.1 Specific objective.

1) To establish the respondents' knowledge, attitudes, perceptions and believes of care givers towards the use of ITNs among the under fives

2) To establish the respondents' Knowledge about Malaria and ITNs

3) To establish the relationship between Intra house hold factors and ITN utilization among respondents with children under five years of age

1.4 Research questions.

1) What are your knowledge, perception, attitude and belief about ITNs?

2) What is your knowledge about Malaria and ITNs?

3) What is the relationship between intra household factors and ITN utilization among the under fives?

1.5 Hypothesis testing

Ho: There is no significant relationship between intra household practices and the utilization of Insecticide Treated Net (ITN) among children less than five years of age.

Ha: There is a significant relationship between intra household practices and the utilization of Insecticide Treated Nets (ITN) among children less than five years of age.

1.6 Scope of the study.

1.6.1 Geographical scope

The district is located in the Eastern region of Uganda bordering several districts, Manafa and Bududa in the East, Sironko in the North, Bukedea on the Northwest, Budaka and Pallisa in the west, Tororo and Butaleja in the Southwest. It lies between the longitudes of 34°E, 35°E and latitude 00°45°N with land area of 534.4 square Km and population density of about 620 persons per square Km. The district has one Municipality with three divisions namely, Wanale, Industrial and Northern.

1.6.2 Content Scope

This research investigated the intra-household factors affecting utilization of insecticide treated nets in households with children under five years of age with a focus on the sleeping arrangements/family sleeping patterns and decision making with regard to who in the household determines who is to sleep under the ITN. The study also examined the

knowledge, attitudes, perceptions and beliefs of caregivers towards the usage of ITNs and the ownership of ITNs by households with children under five years.

1.6.3 Theoretical Scope

With regard to the differences in the intra-household practices that may affect the use or non use of ITNs, The study adapted the socio cognitive theory of social development propounded by Bandura (1986). The theory postulates that human behavior is modeled reciprocally from personal factors, environmental influences and behavioral continuity interacts within their vicinity.

1.6.4 Time scope

The study took a period of five months from May to September 2018. The data was collected in August.

1.7 Significance of the study

The findings of this study were to contribute to the existing body of knowledge concerning the complex nature of Malaria prevention among children less than five years. It was to also contribute to the understanding of the intra-household factors that affect the use of ITNs and the challenges involved in the prevention of Malaria among children less than five years.

The findings of this study were also a source of information to the non government organizations, government and private enterprises who are involved in the promotion of ITNs in the fight against Malaria among children under five. The findings were to also provide an update literature for academicians and be used as a basis for further research on ITNs in Malaria prevention. The study also was to be useful to policy makers, the ministry of health specifically in the department of malaria control. The gaps identified can be explored for further research especially in regard to coverage. On the other hand, it will serve as a partial fulfillment for the award of a bachelors degree in statistics of Kampala International University.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction.

This section provided background understanding on the research studies that were carried out regarding Insecticide Treated Nets usage. This focused on the accessibility of ITNs in households by under fives, knowledge, attitudes, perceptions and beliefs of caregivers towards ITNs and affordability of ITNs by the caregivers as the main thematic areas. It should be noted that, a lot of research studies have been carried out on ITNs especially in regard to availability, accessibility and utilization in general, but no study has been carried out to investigate the intra-household factors that affect the utilization of ITNs in households with children under five years. The purpose of this literature review was therefore to identify the gaps that exit

2.1 Conceptual Framework. Independent Variable. **Out come**

(Intra-household practices)

Dependent Variable

(Utilization status)



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Source: Developed by Author

2.2 Ownership of ITNs

Most international organizations and non government organizations have had a lot of interest in distributing ITNs in malaria epidemic countries in sub Saharan Africa (WHO 2003).Uganda has been a learning center in the use of routine distribution system for the provision of ITNs (Uganda Malaria Indicator 2014/15). This could be one of the reasons why ITN ownership has been constantly increasing in Uganda since 2006 just as reported by the ministry of health in the Uganda malaria indicator survey of 2014/15.



According to the population service international (PSI) which is one of the main distributers of ITNs for children less than five years of age and expectant mothers, once a child is given an ITN it's not replaced until the child gets to the age of five years (Tilson 2007). Mutuku et al---(2013) states that bed nets optimally used when they are new and physically intact and withdrawal in use happens after 1.5 years of use. However repeated campaigns are necessary in order to replace old, damaged and even expired nets for the ITNs to be effective (O'meare et al 2011)

2.3 Perception, attitudes, knowledge and beliefs of using bed nets.

Insecticide treated nets (ITNs) are the mainstay in Malaria prevention. As a vector control intervention, they are effective in preventing Malaria morbidity and mortality in a range of epidemiological settings. In reducing densities and infectivity of Malaria vectors, they reduce overall transmission and protect all individuals within the community (WHO 2006).Mosquito nets have been advocated as the most preventive tools against Malaria especially in Sub-Sahara Africa. In a study conducted in Mbarara on the prevention of Malaria (Nuwaha 2002), avoiding mosquitoes was the common method mentioned for prevention of Malaria. Other preventive strategies mentioned included boiling of drinking water, improved sanitation and clearing bushes around the homes and closing windows early. While most people in this study said ITNs were efficacious both in preventing mosquito bites and malaria, they expressed ignorance of insecticide treated nets and could not tell whether abed net was treated or not. There were some doubts about the bed net efficacy in preventing malaria. Participants mentioned that some households sleep under mosquito nets but their children die of malaria. Whether mosquito nets work or not remains a myth in the minds of the people.

From the above analysis, it seemed to be clear that there are factors with in the household which hinder ITN use that needed further investigation. Barriers towards use of bed nets that would negate their usage included; being expensive, being difficult to keep from holes, being inconvenient by increasing heat and causing sweating, causing suffocation and that it was impossible to buy a net for everyone in a big family. Some people said that they used bed nets when there were plenty of the mosquitoes and kept them in periods when they were not there dry seasons. In a study carried out in Mbarara District western Uganda, it was found out that Mosquitoes were perceived as a cause of Malaria but at the same time use of bed nets was low (26%). People who did not use bed nets sighted discomfort due to heat and humidity: and the high cost of ITNs as reasons for non use (Nuwaha 2002). This therefore accounted for low usage of ITNs.

In a baseline study on Malaria in Ugandan Districts of Mukono, Jinja, Mbarara and Arua, it was found out that 99 percent of respondents knew about Malaria with a high level of knowledge that mosquitoes are the main cause of Malaria. Nearly half of the urban respondents 48.3 percent observed that the use of nets was the most effect way to prevent Malaria. While among the rural respondents there was limited knowledge of the best method for prevention. This literature available looked at perception and attitudes in general. This

study focused on perception, attitudes, Knowledge and believes of using ITNs in households with children under five making a difference from the previous studies.

2.4 Utilization of mosquito nets.

A review on community acceptance of bed nets has shown that various factors influence the use of bed nets, including cultural behavioral and demographic factors, ethnicity, accessibility, gender relations and seasonality of Malaria. Several authors have concluded that although ITNs are effective, local perceptions, acceptance and use of ITNs, as well as use of the primitive methods, are invaluable in Malaria control programs (Winch et-al 1997). It is also known that even if ITNs are purchased and used correctly, they must be retreated quite often and therefore the insecticide may be influenced by its toxicity, the local terms used to translate the chemicals and the meaning attached to these terms.

In a study carried out in Kenya, community reactions were assessed before the introduction of permethrin-treated bed nets. Although Malaria was found to be an important disease, ITNs were believed to be only partially beneficial because of the perception that malaria had multiple causes and further to this, fear was expressed that the chemicals used to treat ITNs were associated with family planning (Alaii et-al 2003). In this study mosquito numbers, relative wealth, number of household occupants and the education level of the head of the household had no effect on the adherence. Excessive heat was often cited as a reason for not deploying the child's ITN. Other important reasons for non adherence were disruption of the sleeping arrangements, indicating that ITNs were not readily redeployed in the face of shifting patterns due to visitors, funeral, house construction and other events .Lack of motivation and technical problems like room to hang child's net also affected consistency in utilization of ITNs.

In a study carried out in Mokono District it was emphasized that the cost of ITNs followed by their non availability were constraints to their use. Similarly, over half of the participants in all the 10 FDGs thought that chemicals used to treat the nets were very harmful to adults, children and pregnant Women (Mbonye et al 2005). The difference between treated and non treated nets was also not known. People believed that all nets were treated with a chemical. Over half of the participants in all FGDs seemed to believe that ITNs are treated with chemicals which affect pregnant women, especially their breathing and that if the chemicals can kill mosquitoes instantly, they can also kill people. This perception was held by non users mainly, although users also believed that in addition it causes feeling of excessive heat and

suffocation at night due to use of ITNs (Mbonye et al 2005). This study investigated the caregivers in households with children under five in regard to acceptability of ITNs

At a baseline interview in Mali none of the 132 households were using ITNs. The most common reasons for not treating their nets were cost (59 percent), availability (23 percent) and lack of knowledge regarding the effectiveness of ITNs in preventing malaria (11 percent). However 93 percent of those who did not treat their nets during the study stated that cost was the main reason. In the village of Piron, 10 of 73 households stated that they had previously treated bed nets and had seen the benefits of ITNs but were not retreating their nets, because there were no net retreatment services available in close proximity at their household (Rhee et al 2005). This study investigated perception held towards children sleeping under ITNs in a different cultural setting from that for the previous studies since cultures vary across time and space.

Given the above study, it was clear that many studies had been carried out on utilization of ITNs. However, none of these studies specifically focused on utilization of ITNs among the under fives with emphasis in the intra household factors which this study addressed. This study was to bridge the information gap on the status of ITN utilization among the children under the age of five years and also determine the factors with in the household that predict utilization and non-utilization.

2.5 Use of Mosquito nets by children.

In Uganda, Malaria burden especially severe disease is greatest among children under five years because they have not developed Immunity to malaria. It is therefore important for the national malaria control program to ensure that this age group is adequately protected by effective prevention interventions such as ITNs .74 percent of children under five used an ITN the night before the survey or in dwelling sprayed with IRS in the 6 months. Among children under five in households with at least one net, 80 percent slept under an ITN the night before the survey.

The proportion of children under five sleeping under an ITN the night before the survey increases as household wealth decreases from 71 percent in the highest wealth quintile to 78 percent in the lowest quintile. While there is little difference in children under five sleeping under an ITN the night before the survey by age, sex or urban-rural residence, by region use ranges form64 people in southwestern and central 2 to 87 in North east(Uganda Malaria Indicator survey 2014/15)

2.6 Affordability of ITNs.

According to the policy and strategy for ITNs, over 80% of people living in Malaria epidemic areas of Uganda area supposed to sleep under ITNs. The majority of these people purchase their nets from the unsubsidized commercial market. However vulnerable groups can obtain subsidized ITNs (MOH 2016). The government of Uganda has put in place programs that target the vulnerable groups supplemented by NGO'S and the private sector. All this is done to ensure that the vulnerable groups especially children under five accesses and sleep under ITNs. Prices are kept low on the commercial markets in both urban and rural areas due to economies of scale as well as competition among ITN suppliers and retailers. Government helps by providing enabling environment which includes generic promotion of ITN products as well as a supportive fiscal and regulatory environment.

2.7 ITNs Vs Malaria Prevention.

The lives of over 400,000 children was saved every year if African children under five sleep under ITNs (Africa Health 2000).Mosquito nets if properly used and maintained can provide a physical barrier to hungry mosquitoes and provide 46% protection against Malaria (RBM, 2001).There are positive effects of insecticide treated nets in reducing the mortality and morbidity of children under five years of age and yet coverage remains low.

ITNs reduce malaria morbidity and mortality, but use is limited. A number of studies have found out that ITNs provide varying degrees of protection against malaria morbidity. In a trial of untreated bed nets in the Gambian, nets were found to reduce the number of infective bites but not enough to reduce morbidity from malaria (Snow et al 1988). Malaria decreases with the use of ITNs. The main reason for this is that mosquitoes are not only kept away from the sleeping people, but would die when they come into contact with the insecticide. In subsequent studies, it was demonstrated further that use of ITNs in pregnancy reduces maternal parasitaemia, anemia and premature deliveries, increases mean birth weight and subsequently reduces neonatal and infant mortality (Dolan et al 1993). This that the role of ITNs among the under five in protecting them against malaria should not be ignored

CHAPTER THREE METHODOLOGY

3.0 Introduction

This chapter covered the background of how data was collected in the research process. It also presented how the study was designed and executed. The methods, the sample size and sampling procedures that were used. It also gave the ethical standards and problems that were encountered during the data collection exercise.

3.1 Research design.

The design of the study was cross sectional where both women and men views were represented .cross sectional design being a short time achieving type of study, involved studying different people at the same time to get a quick picture of the factors affecting utilization of ITNs in the household at a particular time. The quantitative methods were used to establish the social, economic and psychological factors within the household affecting the utilization of ITNs. Qualitative methods were used to investigate perceptions, attitudes, beliefs and knowledge on ITNs. The informative interviews were used to obtain views and experiences of service providers and community leader.

3.2 The area and population of study.

The study was conducted in Northern division, Mbale District. Mbale district is located in Eastern Region of Uganda bordering several Districts, Manafwa and Bududa in the East, Sironko in the North, Bukedea in the Northwest, Budaka and Pallisa in the West and Tororo and Butaleja in the Southwest. The District lies between the longitude of 34 E, and latitude 0045 N with the land area of 5.34.4 square Km and population density of about 620 persons per square Km. The district has one Municipality with divisions namely ; Wanale, Industrial and Northern and it has one town council with 19 sub counties and 467 villages however, our study will be on northern division in three zones Gangama with a household population of 280, Senkulu with a household population of 200 and Bujoloto cell with ahousehold population of 220.

3.3 Sample size and selection.

Northern division is one of the sub-county where free net distribution to children under five was done by the Ministry of Health in 2016. A sample frame consisting of households with children under five years was selected. The study targeted households from three villages of Gangama, Senkulu and Bujoloto representing Northern Sub-county in Mbale district. This

targeted population was hypothetical because the researcher could not reach all the villages in the sub-county.

The study targeted 248 respondents/ households at 95% confidence interval with children less than five years, selected from the three zones according to **Krejcie and Morgan table of 1970** from a population size of 700.

Sampling Unit (zone)	Population size (HH)	Sample Size(n)
Gangama	280	91
Senkulu	200	72
Bujoloto	220	85
TOTAL	700	248

Table. 1 Sample size selection from the three zones

Source: Sample size determination (Krejcie & Morgan, 1970)

3.4 Data collection.

3.4.1 Research instruments.

The research instrument was an Interview schedule for structured interview; The interview schedule was divided into socio-demographic characteristics, intra-household practices and ITN versus malaria.

3.4.2 Ethical consideration and procedure.

To avoid delays and suspicion during data collection, the researcher picked a letter for introduction from the department of statistics Islamic university in Uganda. All respondents were assured confidentiality and in this respondents information was kept as confidential as possible. The researcher acted honestly to the respondents by seeking the consent to participate in the study

The researcher ensured confidentiality of the responses given by the respondents during data collection

The works done by other authors or researchers were acknowledged in the research through citation

3.5 Data analysis.

. Data analysis is a clear way of making reliable and realistic conclusions on a given phenomenon. This was very important to the researcher in order to try and come up with

accurate results that gave a clear view about the situation. The data was edited before, during and after leaving the respondents. The researcher checked for uniformity, accuracy, consistence legibility and comprehensibility. This was then coded and tabulated by Statistical programs such as SPSS program. Chi-square tests were calculated using independent variables such as age, sex, level of education, income and affordability, decision making and awareness of ITNs.

3.6 Interpretation of the mean values

The mean values on the intra-house hold practices affecting ITN utilization a monger the under five children was interpreted as below;

Minimum	Maximum	Scale rating	Interpretation
4.22	5.00	Strongly agree	Very high
3.42	4.21	Agree	High
2.62	3.41	Not sure	Medium
1.81	2.61	Disagree	Low
1.00	1.80	Strongly disagree	Very low

3.7 Limitations of the study.

The limitation of this study was small geographical area. One sub county may possibly not be representative of all communities. The information was collected from residents who were willing to participate and to be interviewed thus limiting the coverage of the study. The researcher also incurred some costs that are in form of transport and material costs.

There was likelihood that all the questionnaires may not be retrieved back from the respondents which would limit the researcher from meeting the sample size. However an allowance of extra questionnaire was provided to cover the gap.

Due to misconceptions that would occur in interpreting some items on the questionnaire, research assistants were trained to explain to the respondents so as the right responses are provided.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.0 Introduction

This chapter presents an in-depth description and analysis of the data obtained in form of frequency counts, correlation coefficients and regression analysis. Respondents were interviewed on issues concerning ITN (Insecticide-Treated Net) ownership and use, knowledge about malaria and ITN, socio-cultural beliefs as well as other intra-household factors that could prevent them from use of ITNs among the under fives. The Statistical Package for Social Sciences (SPSS) version 20 and Excel were used for the analysis of the data as well as statistical tests such as Pearson chi-square test of independence.

4.1 Socio-Demographic Information

The demographic variables considered in the study included Gender, Age, Marital status, education level, Number of ITN in the household as well as the religious background of the respondent (caregivers). The gender of the respondent was categorized as male and female. Age groups were used to categorize the age of the care givers, these included 20-29, 30-39 and 40 above years. The marital status of the respondents was also an important characteristic of the respondents; the respondents' marital status was categorized into four that is to say single, married, divorced and separated. For the education level of the respondents, four categories were used that is to say Primary, Secondary, Diploma and Degree. Religious affiliation was based on four categories that is Islam, Christianity, Seventh day Adventist and Borne a gains. The size of the family in terms of the number of children aged below five years was also taken into consideration. However, this information was not part of the study variables but just provided the biography of the respondent so as to a certain the reliability and validity of the source of data.

Table 4.1 Demog	aphic (Characteris	stic
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Factor	Frequency	Percentage	
Gender			
Male	76	46.3	
Female	88	53.7	
Total	164	100.0	
Age			
20-29	49	29.9	
30-39	77	47.0	
40 above	38	23.2	
Total	164	100.0	
Marital Status			
Single	23	14.0	
Married	102	62.2	
Divorced	22	13.4	
Separated	17	10.4	
Total	164	100.0	
Level of education	• • • • • • • • • • • • • • • • • • •		
Primary	62	37.8	
Secondary	54	32.9	
Diploma	21	12.8	
Degree	27	16.5	
Total	164	100.0	
Religion			
Islam	41	25	
Christian	61	37.2	
Adventist	28	17.1	
Borne again	34	20.7	
Total	164	100.0	
Family Size			
5 below	44	26.8	
5-10	81	49.4	
10-above	. 39	23.8	
Total	164	100.0	

Source: Author's computation from primary data. (With SPSS)

From the descriptive analysis in Table 4.1.0, it was found out that most of the participants 88(53.7%) were female while the least 76 (46.3%) were males. Females were the most participants because they were found responsible for the daily care of their children compared to males and consequently were able to provide a greater positive response to participate in the study. Table 4.1 also indicates that the biggest proportion of participants 77 (47.0%) were aged between 30-39 years, 49 (29.9%) were aged between 20-29 years while the rest were aged 40 years and above. This implies that the study participants were responsible enough to provide reliable information to the researcher. In terms of marital status, the biggest proportion of the participants were married 102 (62.2%), 23 (14.0%) were single, 22 (13.4%) were divorced and the rest were separated. This implies that marital status represented a true reflection of the population that is widely involved in daily care for children less than five years of age. Married participants possibly have the right information about their children than their counterparts. In addition, majority of the respondents 62 (37.8%) were primary holders, 54 (32.9%) secondary holders, 27 (16.5%) degree holders and 21 (12.8%) Diploma holders. Based on religious affiliation, most of the respondent 61 (37.2%) were Christians, 41 (25%) were Muslims, 34 (20.7%) Borne again and only 28(17.1%) Seventh day Adventists. However, the research further brought to book that majority of the respondents 81 (49.4%) had between 5-10 children being less than five years of age, 44 (26.8%) had less than five children of the targeted group and 39 (23.8%) had over ten children of less than five years of age.

4.2 Intra household factors

Intra household factors refers to those practices/behaviors going on within the house and family level that seem to influence and determine ITN use for children less than five years of age. The study breaks down these factors in to four aspects that is to say; Knowledge, Attitude, Beliefs and Perception. These aspects were discussed in tables 4.2.1, 4.2.2, 4.2.3 and 4.2.4. The questions on each aspect required the respondents to rate them basing on a 5 likert scale and the average means were used to generalize for each a spect. A general conclusion regarding intra household practices was made basing on the overall mean.

To deeply understand the impact of Intra-household practices on the Utilization of Insecticide-Treated Nets (ITNs), descriptive statistics were computed in terms of means, standard deviations and ranks. The descriptive Statistics provided the level of Knowledge, Perception, Attitude and Beliefs of caregivers about the utilization of ITNs among the under fives. Means were used as a basis to determine the level of knowledge, attitude, belief and perception of the care givers towards ITN utilization with children under five years of age while ranks were used to identify the factors that were most rated and least rated by participants.

4.2.1 Knowledge

Table 4.2.1 Descriptive Statistics on Knowledge

Factors	Mean	Standard	Rank	Interpretation
		deviation		
Not sleeping in an ITN causes mosquitoes to bite you while a sleep	3.98	1.167	1	High
Ever since we started using ITNs malaria attacks on my family have reduced	3.76	1.277	2	High
Malaria is a disease caused by mosquito bites	3.71	1.286	3	High
All members in my HH know how to use the ITN	3.63	1.224	4	High
Proper and constant use of ITNs prevents malaria from my family	3.42	1.388	5	High
The ITN is different from any other bed net on the market	2.58	1.306	6	Low
I know the chemical used to re-treat the ITN	2.05	.964	7	Low
Overall mean	3.30			Medium

Source: Authors Computation from Primary Data. (With SPSS)

Results in Table 4.2.1 reveal the mean response regarding the items under knowledge. Seven items were used to measure caregivers knowledge about the use of ITNs with children less than five years of age and respondents were asked to rate the items based on a 5-Likert scale. Results reveal that, regarding weather not sleeping in an ITN causes mosquitoes to bite you while a sleep was rigorously ranked the highest in this construct with (mean=3.98, st.dev=1.167) interpreted as High. This implies that in the zone where the study was conducted, the care givers are aware that if their under five children do not sleep in the ITN, they would be bitten by mosquitoes that are responsible for spreading malaria. Regarding the rate of reduction on malaria attacks in the family ever since they begun using ITNs and this was ranked second with (mean=3.76 st.dev=1.277) interpreted as High. This suggests that the respondents are knowledgeable about the role that ITNs play in reducing malaria attacks. With respect to Malaria being a disease caused by mosquitoes being ranked fourth with (mean=3.71, st.dev=1.286) interpreted as High, care givers expressed high knowledge on this

factor as it has a direct translation for the vector and the disease. Proper and constant use of ITNs prevents malaria from the family was ranked fifth with (mean=3.42, st.dev=1.388) interpreted High. This implies that the caregivers of this vulnerable age group know that ITNs can only be effective if they are properly and consistently used. However regarding weather the care givers would differentiate between an ITN from any other bed net on the market was ranked second last with (mean=2.58, st.dev=1.306) interpreted as Low. This implied that the respondents had little or no knowledge about Insecticide Treated Nets (ITNs) since they would not tell the difference. Furthermore it meant that they would be given any net in the name of ITN and they take it home. I know the chemical used to re-treat the ITNs was also among the items used to measure the respondents' knowledge about ITNs and this was ranked last with (mean=2.05, st.dev=0.964) interpreted as Low. This low level of knowledge about the chemical used to re-treat ITNs coupled with the inability to differentiate the ITN indicated that respondent never re-treat their ITNs if they indeed have any.

In general, the level of respondents knowledge about the use of ITNs among their under five children was medium implied by an average mean of 3.30.

4.2.2 Attitude

Table 4.2.2	Descriptive	Statistics	on Attitude.
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Factors	Mean	Standard	Rank	Interpretation
		deviation		
I prefer the use of ITN than other	3.75	1.225	1	High
tools of malaria prevention				
In my own opinion the ITN is			2	High
expensive to own for every	3.69	1.264		
family member				
I always visit a health			3	High
center/doctor whenever my child	3.52	1.407		
gets malaria				
Malaria rate of spreading has no	2.40	1 202	. 4	High
specific season	3.40	1.303		
ITNs develop holes very fast			5	Medium
when hanged on the bed every	3.16	1.469		
day				
Government has done enough in	0.50	1.200	6	Low
distributing ITNs in my village	2.39	1.396 .		
Overall mean	3.36	•		Medium

Source: Authors' computation from primary data. (With SPSS)

Table 4.2.2 shows the mean responses of items under attitude. Six items were used to measure the care givers' thinking and feeling towards the use of Insecticide Treated Nets (ITN) with children less than five years of age in the selected sub-county. I prefer the use of ITN than other tools of malaria prevention was the most ranked item with (mean=3.75. st.dev=1.225) interpreted as High. This implies that the care takers of these children do have a high feeling that ITNs do well in prevention of malaria compared to other malaria control policies such as use of coils. In my own opinion, the ITN is expensive to own for every family member in the household was ranked second item with (mean=3.69, st.dev=1.264) interpreted as high. This implies that in case of households with many children under five years of age, some of them may not have the opportunity to sleep under the ITN due to shortage problem. The study went ahead and ascertained the caretakers' attitude on whether they visited the doctor or health center if their child/children contracted malaria and this was ranked third with (mean=3.52, st.dev=1.407) interpreted as High. When this attitude in coupled with the high level of preference for ITN utilization to prevent malaria, it can therefore be seen that the care takers are aware that prevention is important but if not achieved and a child gets malaria, then they can always run to the health center to sick the doctor's help. Malaria rate of spread having no specific season was ranked fourth in the construct with (mean=3.46, st.dev=1.303). This implies that the care givers had a strong feeling that malaria did not have a specific time of attacking, it would attack the child at any time and in any season. When the respondents were asked whether ITNs develop holes very fast when hanged on the bed every day, this aspect was ranked fifth with (mean=3.16, st.dev=1.469) interpreted as Medium. This implies that the respondents are optimal about ITNs developing holes when hanged on the bed daily meaning they would opt their child to sleep in the ITN for some nights and other nights not because of the fear for tear and wear of the ITN. The study further examined the respondents' attitude on whether government had done enough in distributing ITNs in the village, this was ranked last with (mean=2.59, st.dev=1.396). This low ranking implies that care givers of this vulnerable age group feel net distribution within the village has a small coverage and if this trend continues then malaria mortality in the vulnerable age group will not reduce or if so, it will reduce at a slow rate. On a general observation, the respondents' level of attitude was rated medium evidenced by

the overall mean of 3.36 for all items.

4.2.3 Belief

Table 4.2.3 Descriptive Statistics on Belief

Factors	Mean	Standard	Rank	Interpretation
		deviation		
ITNs create heat and suffocation	3 50	1 350	1	High
to the child while a sleep	5.50	1.550		
The ITN makes my child	2.26	1 269	2	Medium
uncomfortable during sleep	5.20	1.508		
The chemical used to treat the	2 10	1 226	3	Medium
ITNs is harmful to humans	5.19	1.330		
All nets on the market are treated	3.06	1.369	4	Medium
ITNs bring bed burgs in the house	2.79	1.382	5	Medium
My culture does not allow me to	2.06	1 101	6	Low
sleep in the ITN	2.00	1.191		
Overall mean	2.98			Medium

Source: Authors' computation from primary data (With SPSS)

Table 4.2.3 show the care takers' mean responses on their belief about ITN use with children under the age of five. From the six items used to rate respondents' beliefs on the utilization of insecticide treated nets with children under five, ITNs create heat and suffocation to the child while a sleep was rated number one with (mean=3.50, st.dev=1.350) interpreted as High. This implies that the care takers' have a strong belief that ITNs create heat and there can cause suffocation to their children, this belief is seen very common among the non users of nets. The study further ascertained whether the ITN makes the child uncomfortable during sleep and this was ranked second in this construct with (mean=3.26, st.dev=1.368) interpreted as medium. This implies that to some extent ITNs are seen as a cause of discomfort to children by the care takers. In order to become well acquainted with the respondents' belief on ITN utilization, the study asked them to rate whether the chemical used to treat ITNs was harmful to humans, this was ranked third with (mean=3.19, st.dev=1.336) interpreted as medium. This implies that there is an unsettled thoughts and belief that if the chemical can kill a mosquito then in the long run it may have an effect to the child. All nets on the market are treated was ranked fourth with (mean=3.06, st.dev=1.382) interpreted as Medium. This suggested that the care takers have a mindset that whatever exists on the market as a net is actually treated with parathyroid solution and if this belief continues in them then our goal of having malaria free Uganda may not be attained. To find out if ITNs bring bed burgs in the house was ranked second last with (mean=2.79, st.dev=1.383) interpreted as medium. My culture does not allow me to sleep in the ITN was ranked last with (mean=2.06, st.dev=1.191) interpreted as low. This implies that there is a low belief that any culture in the village would not allow people to sleep under the ITN.

Generally, the findings from the study showed that there was a medium level of belief about the utilization of Insecticide Treated Nets among the under fives evidenced by the average mean of 2.98.

4.2.4 Perception.

Factors	Mean	Standard	Rank	Interpretation
		deviation		
The number of ITNs in the HH			1	High
disrupt the sleeping	3.78	1.198		
arrangement in the house				
ITNs are a better tool for the	3 78	1 301	2	High
prevention of malaria	5.76	1.301		
The cost of re-treating the ITN	3 40	1 200	3	High
is high	5.49	1.522		
The chemical used in ITNs is	3 36	1 301	4	Medium
harmful to pregnant mothers	5.50	1.501		
ITNs bought from the open			5	Medium
market are better than those	3.31	1.330		
distributed by government				
I can differentiate between an			6	Low
ITN and any other form of bed	2.40	1.176		
net .				
Overall mean	3.35			Medium
GENERAL MEAN	3.25			Medium

Table 4.2.4 Descriptive Statistics on perception.

Source: Author's computation from primary data. (With SPSS)

Table 4.2.4 shows the mean responses of items under the intra-household factor Perception. In this table, six items were used to establish the level of the care takers' perception, with regard to utilization of Insecticide Treated Nets (ITNs) with children under five. The number of ITNs in the household disrupts the sleeping arrangement in the house was ranked first in this construct with (mean=3.78, st.dev=1.198) interpreted as High. This high level of disruption in the sleeping arrangement suggests that where household members are more than the number of ITNs available then the ratio of children to an ITN is born to change. Regarding ITNs being a better tool for the prevention of malaria this was ranked second with

(mean=3.78, st.dev=1.301) interpreted as High. This implies that the caretakers pensive ITNs as being a better tool for prevention of malaria compared to other tools available such as spraying. The cost of re-treating ITNs is high was ranked third with (mean=3.49, st.dev=1.322) interpreted as High. This high level of perception implies that care takers' rarely retreat the ITN from the time of acquisition. When this kind of understanding is coupled with the chemical used to retreat ITNs being harmful to pregnant mothers which was ranked fourth with (mean=3.36, st.dev=1.301) interpreted as Medium. This suggests that respondents perceive ITNs as a harmful tool to expecting mothers. With respect to whether ITNs bought from the open market are better than those distributed by the government, this was ranked second last with (mean=3.31, st.dev=1.330) interpreted as Medium. This implies that on average, the care takers think that ITNs bought from the open market are better than those distributed by the government. However care takers showed low level of differentiating between an ITN and any other form of bed net ranked last with (mean=2.40, st.dev=1.176) interpreted as low. In general, the findings from the study showed that care takers' perception towards the utilization of Insecticide Treated Nets was medium as evidenced by an average mean of 3.35 in the construct above.

In reference to the study's first objective which aims at establishing the respondents' knowledge, attitude, beliefs and perception of care takers towards the use of Insecticide Treated Nets (ITNs) among the under fives in the selected cells of Northern sub-county, the results of table 4.2.4 reveal the **General mean of 3.25 (Medium)**, implying that there is a medium level of intra household factors that affect ITN utilization among the under fives in the zones where the study was carried out. This was reached on basing on the average means under each factor that was investigated in the study.

4.3 ITNs versus Malaria

Factors	Mean	Standard	Rank	Interpretation
		deviation		
Malaria causes death in children	4.18	.906	1	High
malaria attacks on my family are high in the rainy season	4.02	1.009	2	High
Malaria can be prevented by sleeping under ITNs	3.81	1.241	3	High
ITNs only keep away mosquitoes from children while they are a sleep	3.66	1.312	4	High
It is a female anopheles mosquito that spreads malaria	2.69	1.266	5	Medium
ITNs keep away and kill mosquitoes from sleeping children	2.26	1.213	6	Low
Overall mean	3.44			High

Table 4.3 Descriptive Statistics on ITN versus Malaria

Source: Authors' computation from primary data.

Table 4.3 above shows the mean responses of care takers with children under the age of five about the importance of Insecticide Treated Nets (ITNs) in reducing malaria. Out of the six items that were used to rate this variable, malaria being a cause of death in children was ranked first in this construct with (mean=4.18, st.dev=.0.906) interpreted as High. This implies that the respondents or care takers of these children are aware that malaria if not prevented is a major cause of morbidity and mortality in their children under five years of age. This implication is further justified by the fact that the same respondents highly believe that malaria can be prevented by sleeping under the ITN as this was ranked third with (mean=3.81, st.dev=1.241) interpreted as High. Referring to whether malaria attacks were high in the rainy season in their households, the respondents ranked this item second with (mean=4.02, st.dev=1.009) interpreted as High. The respondents in this regard highly believe that malaria attacks on their family are very common in the rainy season, this could be attributed to the fact that mosquitoes find stagnant waters where they bread from in the rainy season hence crossing to the households. The care takers were further asked how ITNs are effective and this was ranked fourth with (mean=3.66, st.dev=1.312) interpreted as High. This implies that most of the respondents believe that ITNs only keep away mosquitoes from the children while asleep. The respondents further showed that they were not sure about a female anopheles mosquito being the one that spreads malaria as this was ranked second last

with (mean=2.26, st.dev=1.266) interpreted as medium, they could only conclude with strong contentment that malaria is a disease caused by a mosquito but not specify the kind. The study went on to intrinsically ascertain the care takers, knowledge on the effectiveness of the ITNs using the item ITNs keep away and kill mosquitoes from sleeping children, this was ranked last in this construct with (mean=2.26, st.dev=1.213) interpreted as Low. Comparing the two items 4 and 6 we can conclude that the respondents are not fully informed about the effectiveness of a treated net (ITN) as they think that the ITN just keeps away mosquitoes like these ordinary nets.

According to objective two, the study aimed at establishing the respondents' level of knowledge about Insecticide Treated Nets and their role in preventing malaria morbidity and mortality among the under fives in northern sub-county Mbale district, it was therefore revealed from the findings of the **overall mean of 3.44** in the Table 4.3 that there is relatively High level of knowledge about ITNs and their role in malaria control among the under fives.

4.4 Utilization of Insecticide Treated Nets (ITNs)

Malaria is shown globally as a public health burden (WHO, 2014; Maillard et al: 2015). The use of Insecticide Treated Nets (ITN) is an effective intervention for malaria control. In this study therefore, utilization was measured using six items that were rated on a 5-likert scale and analysis was based on means of each item. Generalization and conclusion on the level of utilization was based on item means from each of the items in the construct.

	7	Г	r	
Factors	Mean	Standard	Rank	Interpretation
		deviation		
I always try to cover the holes that develop on the ITN	3.19	1.438	1	Medium
My child always sleeps in an ITN	2.82	1.423	2	Medium
I always dry the ITN in the shade after washing	2.71	1.343	3	Medium
I immediately replace my child's ITN in case it is worn out	2.66	1.441	4	Medium
My child can enter in to the ITN even without my help	2.52	1.299	5	Low
I always re-treat the ITNs in my HH	2.32	1.203	6	Low
I some time use my ITN in the garden to protect my plant from pests	2.27	1.339	7	Low
Overall mean	2.60			Low

Table 4.4.1 Utilization of Insecticide Treated Nets.

Source: Authors computation from primary data.

Table 4.4 shows the mean responses of respondents about the level of utilization of Insecticide Treated Nets among the under five children. Seven items were used to measure the level of ITN utilization in the selected sub-county. Care takers were supposed to rate these items based on a five likert scale and the results of the study revealed a low level of ITN utilization as evidenced by the Overall mean of 2.60 with regards to whether the respondents always tried to cover the holes that developed on the ITNs, this was ranked first with (mean=3.19, st.dev=1.438) this was interpreted as medium implying that the care takers would at times try to improvise by covering the small holes that could develop on the ITN as a way of ensuring that their children are not bitten by mosquitoes. Care takers were also asked whether their children always slept under ITNs, this was ranked second with (mean=2.82, st.dev=1.423).Implying that to some extent, the care takers tried to ensure that their under five children sleep under the ITNs. As a form of proper utilization of ITN, the study asked care takers whether they did hang their nets in the shade whenever they washed them and this was ranked third with (mean=2.71, st.dev=1.343) this suggested that to some smaller extent the care givers tried to hang ITNs in the shade after washing. Regarding the time frame in which the respondent replaces the worn out ITN, the respondents ranked this fourth with (mean=2.66, st.dev=1.441) implying there was a medium level of immediate

replacement of the ITNs in the household whenever they could get worn out. However, there was an unexpectedly low level of ITN retreatment as this was ranked second last with (mean=2.32, st.dev1.203) implying that care takers really retreated the ITNs from the time of acquisition. This finding is not fur from the fact that the care takers had earlier on expressed ignorance about the chemical (parathyroid) that is used to re-treat the net in Table 4.2.1 (item 7).

4.5 Number of ITNs Owned Versus Family Size

To clearly bring out this association, the researcher sought to use a cross tabulation to show how the number of ITNs are related to the family size in terms of number of children.

Number o	f	Family Size			Total	Valid
ITNs		5 below	5-10	10 above		percent
						(%)
-	1	16	31	8	55	33.5
2	2	10	22	11	43	26.2
3	3	9	11	5	25	15.2
4	4	9	6	6	21	12.8
	5	0	5	7	12	7.3
	5	0	5	1	6	3.7
	7	0	1	0	1	0.6
	3	0	0	1	1	0.6
Total		44	81	39	. 164	100.0

Table 4.5; Number of ITNs versus Family Size Cross Tabulation.

Source; Authors' computation from primary data (with SPSS).

Table 4.5 results revealed that 55 (33.5%) of the respondents owned at least one ITN, 16 of them had 5 below children aged less than five, 31 of the respondents affirmed having between 5 and 10 children of less than five years while the remaining 8 respondents had 10 above children of five years below. The table also reveals that only two care takers out of 164 who participated in the study with children more than 10 had got between 6 to 8 ITNs. This implies that the number of ITNs in the households does not clearly tally with the number of children that these caretakers have.

4.6 Relationship between Intra household practices and Insecticide Treated Nets (ITN) Utilization among the under fives.

In order to establish the third objective of the study, Pearson's correlation coefficients were computed. Findings were presented in table 4.4 on the relationship between intra household practices and ITN utilization.

		Knowledge	Attitude	Belief	perception
S					
	Pearson	.209*	259*	135	072
Utilization	correlation				
	p-value	.007	.001	.085	.362

Table 4.6 Pearson's correlation coefficient among Intra household practice(knowledge, Attitude, Belief and Perception) and ITN utilization.

Source: Authors' computation from primary data.

The third objective of the study was to establish the relationship between intra household factors (Knowledge, Attitude, Belief and Perception) and ITN utilization among the under fives.

The person correlation coefficient value for Knowledge and ITN utilization r= 0.209 and the P-value= 0.007. This implies that there is a low positive relation between knowledge and ITN utilization in the selected zones. However the P-value 0.007 suggests the existence of a statistically significant relationship between care takers' knowledge and ITN utilization among the under fives.

In establishing the relationship between attitude and ITN utilization, the person correlation coefficient was r= -0.259 and a P-value =0.001. This signified a low negative relationship between attitude and ITN utilization. On the other hand, the P-value=0.001 implies the presence of a statistically significant relationship between the intra household factor attitude and ITN utilization among the under fives.

Belief and ITN utilization showed a negative Pearson correlation coefficient value of 0.135 with a P-value of 0.085. This P-value indicates the presence of a non significant relationship between care takers beliefs and ITN utilization among the under fives. Not fur from the above, the relationship between perception and ITN utilization revealed a Pearson correlation coefficient r=-.0072 and a P-value =0.362. This result indicates a negative relationship

between perception and ITN utilization, whereas the P-value suggests a non statistically significant relationship between perception and ITN utilization among the under fives in the selected zones in Northern Sub-county.

On a general observation, the intra household factors of knowledge and attitude have a statistically significant relationship with ITN utilization whereas belief and perception have anon statistically significant relationship at 0.05. However knowledge has a positive correlation whereas the other three factors have negative correlations with ITN utilization among the under fives.

Utilization	Un standardized coefficients		Standardized coefficients	t-stat	sig	VIF		
	В	Std error	В					
Constant	3.164	0.476		6.652	0.000			
Knowledge	0.201	0.079	0.198	2.549	0.012	1.080		
Belief	-0.192	0.065	-0.229	-2.978	0.003	1.066		
Perception	-0.048	0.081	-0.046	-0.596	0.596	1.088		
Attitude	-0.134	0.088	-0.118	-1.532	0.0127	1.059		
F. value = 5.188 ,	F. value = 5.188 , R. squared = 0.115 , Overall sig value = 0.001 , df = 4							

Table 4.7 Multiple Regression Analysis of Intra household Factors and ITN utilization

Source: Authors' computation from primary data (with SPSS).

Table 4.6 shows the regression analysis of intra household factors and ITN utilization among the under fives, the results from the analysis reveal that the standardized coefficient for knowledge is 0.198, t-statistic of 2.549 and a P-value 0.012 with a Variance Inflationary Factor (VIF) of 1.080. Since the t- statistics value is greater than 2 and p-value less than 0.05, this implies a significant relationship between knowledge and ITN utilization among the under fives

In the same regard, the standardized coefficient of belief is -0.229, t-statistic of -2.978, P-value 0.003 with a VIF of 1.066. This implies that there is a statistically significant relationship between belief and ITN utilization since the calculated P-value (0.003) is less than the standard P-value($\alpha = 0.05$).

The standardized coefficient of perception is 0.081, t-statistic -0.596, P-value 0.596 and a VIF value of 1.088. This implies that there is a non statistically significant relationship between perception and ITN utilization since the calculated P-value (0.596) is greater than the standard P-value at 5%.(0.05).

Attitude on the other hand had a standardized coefficient of -0.118, t-statistic of-1.532, P-value of 0.0127 with a VIF of 1.059, suggesting the presence of a statistically significant relationship between the caretakers attitude and ITN utilization among the under five. The VIF is a measure of the degree of multicollinearity among the predictor or explanatory variables and with regard to this study, the VIF values lies between1.059 and 1.088 which is less than 5 implying that there is no deterministic relationship (multicollinearity) among the explanatory variables.

The estimated regression model and its overall significance in the model

$$U=3.164+0.201K-0.192B-0.048P-0.134A$$

3.164, this is the value of ITN utilization when all the intra household factors are zero. This means that even without the influence of intra household factors, 31.64% level of ITN utilization is realized.

0.201, this value implies that for a unit increase in knowledge, ITN utilization increases by 20.1%, keeping belief, attitude and perception at zero.

-0.192, this value implies that for a unit increase in Belief, ITN utilization decreases by 19.2%, keeping knowledge, attitude and perception at zero

-0.048, this value implies that for a unit increase in Perception, ITN utilization decreases by 4.8%, keeping knowledge, attitude and belief at zero.

-0.134, this implies that for a unit increase in Attitude, ITN utilization decreases by 13.4%, keeping knowledge, belief and perception at zero.

Generally, we can observe from the coefficients that most of the intra household factors have a reducing effect on the level of ITN utilization among the under five children despite the fact that the care taker's knowledge on ITNs is high. However the overall model is significant at 95% level of significance with (F-value 5.188 and sig value 0.001), explaining up to 11.5% (R-squared=0.115) variation in ITN utilization due to intra household factors. It is upon this back group that we can reject the null hypothesis and conclude that there is a statistically significant relationship between intra-household practices and ITN utilization among the under fives.

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATION

5.0 Introduction.

In this chapter the researcher discussed the findings of the study in line with the research objectives. The researcher also provided evidence from other previous studies in regard to the effect of intra household practices on ITN utilization among the under five children.

5.1 Summary.

This study was conducted to analyze the relationship between intra household factors and ITN utilization among the under five children in northern sub-county. The research used purposive and simple random sampling procedures to obtain the representative sample from the target population. Both qualitative and quantitative methods of data collection were adopted where a self-administered questionnaire (SAQ) was used to collect quantitative primary data. The findings of the study were presented in form of frequency counts and correlation coefficients.

According to the research objectives, the study revealed that there was a medium level of intra household factors where the study was conducted with a general mean of 3.25. The study also investigated the respondents' knowledge about ITNs and malaria and this was found to be high with average mean of 3.44. whereas the respondents' level of ITN utilization was Low with average mean 2.60. The findings of the study revealed a statistically significant relationship between Intra household factors ant ITN utilization.

5.2 Discussion

5.2.1 Respondents Knowledge, Belief, perception and Attitude regarding ITN utilization among the under fives.

Respondents were asked about their knowledge, belief, attitude and perception towards use of ITNs. For those who owned ITNs, majority reflected high level of knowledge about ITNs. This is supported by the fact that all their household members acknowledged that proper and constant use of ITNs prevents malaria from their families. In spite of this high level of knowledge about ITNs, belief, attitude and perception of care takers were revealed to be negatively affecting the utilization of ITNs among the under fives. This is clearly illustrated by the negative coefficients in the regression model. This reduction effect on the level of ITN utilization is attributed to care takers' belief that ITNs create heat and suffocation to the child while a sleep, the attitude that ITNs are expensive to own for every family member in the

household and the perception that the number of ITNs disrupts the sleeping arrangement in the house. Such factors are coupled with the fact that most caretakers cannot differentiate between ITNs and other bed nets on the market, failure to re-treat the ITN because they do not know the chemical and those who know it find it expensive to buy.

These findings about peoples' perception and attitude towards the use of ITNs among the under fives have also been demonstrated by Galvin et al (2010). In that study, it was found out that Ghanaians have the perception about nets being too hot to sleep under, therefore the study recommended that stake holders should address the problem of suffocation and heat by increasing mesh size and use of durable material.

5.2.2 ITNs versus Malaria

In a study on malaria transmission by the vector Anopheles mosquito in a coastal region of Ghana, it was suggested that effective vector control strategy required information on the main vector and transmission (Tchouassi et al, 2012). In this study, the results revealed a high level of knowledge about malaria and the role of ITNs in preventing it with an average mean of 3.44. This mean was a firmed by the fact that respondents know that malaria is a disease caused by mosquito bites and that it can be prevented by sleeping under the ITN. Furthermore, the respondents acknowledged that malaria can cause deaths in all age groups but more especially in children less than five. The respondents also said that in cases where they have not achieved effective and efficient prevention from ITNs and malaria attack the child, they always visit the health center/doctor. This kind of findings were also shown by Tamramat et al, 2014 who examined malaria related knowledge and practices among residents in Horin city to guide forthcoming malaria elimination revealed that the knowledge, prevention and treatment of malaria among the residents in Hori has a direct link to the use of ITNs and suggested that education on the symptoms, causes and prevention should be the focus.

5.2.3 Number of ITNs versus family size

The possession of ITN among the households in Northern sub-county was encouraging, of the 164 respondents interviewed, 55(33.5%) said they owned at least one ITN. This finding is not surprising looking at the knowledge level of respondents about malaria, its causes and effect. However, this finding is below the Abuja target of 60% coverage by 2010 and the RMB partnership Global strategy plan to ensure 80% coverage of people at risk of malaria are protected by year 2015(Jane et al,2012,Johnson et al, 2015, PMI 2015) The study also revealed that the least number of ITN a given household would have is 1 (33.5%) with the

maximum being 8 (6%) this corresponds to a minimum family size of less than five and maximum family size of 10 children above aged less than five. However, majority of the respondents 81 had the family size ranging from 5 to 10 children of less than five years of age. General observation from the findings shows that the number of ITNs in the households does not clearly tally with the number of children as the children's ratio to a net is 6 : 1

5.3 Conclusion

This chapter presents conclusions and policy implications based on the findings. The use of ITNs has been found to be effective in preventing malaria infection. However, in Uganda and other Sub-Saharan African countries, use of ITNs by children under five years of age had not achieved the Abuja target of 80 percent by 2010. One of the objectives of this study is to identify the intra- household factors that affect use of ITNs among under fives. This study therefore concludes that there are intra-household factors that affect utilization of ITNs within households with children under five years of age. These factors include: knowledge, belief, attitude and perception. These factors therefore hinder proper coverage of all household members and therefore presence of an ITN in a household may not guarantee utilization. Other factors not identified in this analysis may certainly also have contributed to non-usage, at least indirectly. For instance, some households reported as not owning an ITN may have received an ITN but for some reason used it in the garden for some one reason or disposed it off. Therefore, efforts to increase ITN use should be based on detailed evidence on particular area/ zone why people don't use ITNs.

The government should sensitize parents aged 20-29, 30-39 with children under the age of five to make use of Insecticide Treated Nets effectively and not to use it abusively. In order to bridge the gap between ITN ownership and utilization, rigorous efforts are required to change behavior by providing accurate information most particularly by convincing people that mosquitoes are the only source of malaria and that ITNs are the best way to prevent infection from mosquitoes.

5.4 Recommendation

Based on the findings of this study, household size is found to significantly affect use of ITNs with household with fewer members being more likely to sleep under an ITN. This could be attributed to inadequate ITNs to cover all household members in case of large families since the ITNs may not be enough. This study recommends that plans to increase the number of free ITN distribution among the vulnerable age of less than five should be continued. The study further found that the respondent's beliefs, attitude and perception was significant in

reducing ITN utilization. In order to address this misconception, this study suggests that increased ,mass education through media(televisions / radios), health education or talks in the communities by health workers through Village Health Teams (VHTs) should be continue, support community based communication efforts to promote correct and consistent use of ITNs.

5.5 Suggestions on Further Studies

The study was limited in examination of intra-household factors which affect ITN utilization among the under fives. It only focused on a few aspects that is knowledge, belief, attitude and perception. Hence there is need for further researches to measure the impact of malaria control and prevention activities and identify gaps and weaknesses to improve program implementation

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APPENDIX 1: RESEARCH INSTRUMENTS

QUESTIONNAIRE ON USE OF INSECTICIDE TREATED NETS (ITNs) IN HOUSEHOLDS WITH CHILDREN UNDER FIVE YEARS OF AGE.

I am MWANIKA ABUBAKAR a student of Kampala International University. Conducting a study on "Use of insecticide treated nets in households with children less than five years of age and Malaria infection". The study is mainly for academic purpose and you have been selected to participate in the study by completing the questionnaire. Your responses will be treated with confidentiality.

(Please tick your response i.e. [Thank you

Part A: Demographic Characteristics of Respondents

1	G	en	d	er

1. Male	2. Fem	nale	
2. Age			
1.20-29		2. 30-39	
3. 40 above			
3. Marital status			
1. Single		2. Married	
3. Divorced	· · ·	4. Separated	
4. Level of education			
1. Primary		2. Secondary	
3. Diploma		4. Degree	
5. Number of ITNs in t	he house hold (write figu	re in the box)	
6. Religion			
1. Islam		2. Christian	
3. Adventist		4. Borne again	
7. What is the size of ye	our family?		
1.5 below		2. 5-10	3. 10 above

Part b: Dependent Variable, Utilization of Insecticide Treated Nets (ITNs)

Please indicate how much you agree or disagree with each of the following statements using the scale given below:

.

		· · · · · · · · · · · · · · · · · · ·		·		1
NO	Measurement Variable	1	2	3	4	5
	Utilization of insecticide treated nets (ITNs)	SD	D	NS	A	SA
1	My child always sleeps in an ITN					
2	I always re-treat the ITNs in my household					
3	I always dry the ITN in the shade after washing					
4	I always try to cover the hole that develop on the ITN					
5	My child can enter into the net even without my help					
6	I immediately replace my child's ITN in case it is worn out					
7	I sometimes use my ITN in the garden to protect my plants from pests					

1=Strongly Disagree(SD), 2= Disagree(D), 3=Not sure(NS), 4=Agree(A), 5=Strongly Agree(SA)

Part c: Independent Variable; Knowledge, Attitude, Beliefs and Perception

Please indicate how much you agree or disagree with each of the following statements using the scale given below:

1=Strongly Disagree(SD), 2= Disagree(D), 3=Not sure(NS), 4=Agree(A), 5=Strongly Agree(SA)

NO	Measurement Variable	1	2	3	4	5
	Knowledge	SD	D	NS	A	SA
1	All members in my household know how to use an ITN					
2	Ever since we started using ITNs malaria attacks on my children					
	and other family members have reduced					
3	Not sleeping in an ITN causes mosquitoes to bite you while a					
	sleep					
4	Proper and constant use of ITNs prevents malaria from my family					
5	The ITN is different from any other bed net on the market					
6	Malaria is a disease caused by mosquito bites					
7	I know the chemical used to re-treat the ITN					
NO	Attitude	1	2	3	4	5
1	I prefer the use of an ITN than other tools of malaria prevention					
2	In my own opinion the ITN is expensive to own for every family					
	member					
3	ITNs develop hole very fast when hanged on the bed every day					
4	I always visit a health center/doctor whenever my child gets					
	malaria					
5	Government has done enough in distributing ITNs in our village					
6	Malaria rate of spreading has no specific season					
NO	Beliefs	1	2	3	4	5
1	My culture does not allow me to sleep in an ITN					
2	The ITN make my child uncomfortable during sleep					
3	All nets on the market are treated					
4	The chemical used to treat ITNs is harmful to humans					
5	ITNs bring bed burgs in to the house					
6	ITNs create heat and suffocation to the child while a sleep					
NO	Perception	1	2	3	4	5
1	The cost of re-treating the ITN is high					
2	The number of ITNs in the household disrupts the sleeping					
	arrangement in the house					
3	I can differentiate between an ITN and any other form of bed net					
4	ITNs are a batter tool for the prevention of malaria					
5	The chemical used in ITNs is harmful to pregnant mothers					
6	ITNs bought from the open market are better than those distributed by					
	government					

Please indicate how much you agree or disagree with each of the following statements using the scale given below:

NO	ITNs versus Malaria	1	2	3	4	5
		SD	D	NT	A	SA
1	Malaria can be prevented by sleeping under ITNs					
2	It is a female anopheles mosquito that spreads malaria					
3	Malaria causes death in children					
4	ITNs only keep away mosquitoes from children while they are a sleep					
5	ITNs keep away and kill mosquitoes from sleeping children					
6	Malaria attacks on my family are high in the rainy season					

1=Strongly Disagree(SD), 2= Disagree(D), 3=Not sure(NS), 4=Agree(A), 5=Strongly Agree(SA)

Thank you for your cooperation End