PREVALENCE AND FACTORS AFFECTING UTILIZATION OF INSECTICIDES TREATED MOSQUITO NETS AMONG SELECTED PARISHES IN BOBI SUB COUNTY, OMORO DISTRICT

ADONG LILLIAN CLAUDIA
2015-BNS-TU-034

AN UNDERGRADUATE RESEARCH REPORT SUBMITTED TO THE SCHOOL OF NURSING IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF A BACHELOR'S DEGREE IN NURSING SCIENCES OF INTERNATIONAL HEALTH SCIENCES UNIVERSITY

NOVEMBER, 2018

DECLARATION

This work has been submitted in partial fulfillment of the requirements for the award of Bachelor's degree in nursing science. I therefore declare that this work is my own original work as a result of my efforts and views expressed are not necessarily those of the University, hence the examiners and management of the University cannot be held responsibility of the views expressed.

I also declare that this work has not been submitted for any award of degree by any other person or university and I have not colluded with others in its preparation. Where I have used some else's work, I have acknowledged it. And I acknowledge that plagiarism is against the university's rules.

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ADONG LILLIAN CLAUDIA

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APPROVAL

This is to declare that this research dissertation has been produced and submitted to the University with my approval.

Signature_____

DR. JOHN ODDA

SUPERVISOR

Date_____

DEDICATION

I dedicate this piece of work to my parents (Mr.Okidi Lawrence and Mrs. Julia Auma Okidi), my children (Norberta Divine and Mclawrence Polber), Mentor (Prof. Ponsiano Ocama) and my sisters and their families: Margaret, Janet, Grace, Winifred and Monica. And brothers: Francis Basil and Norbert Noris and their families for their love, moral support and encouragements throughout the period of my study. Prisca Lanyero who was always available when i needed care for my children, she will never hesitate. May God bless them all.

ACKNOWLEDGEMENT

I acknowledge my family, especially my parents and my siblings for taking care of my children during the entire course, their moral support and to my lovely son and daughter who missed my presence while I was busy with my academic schedule.

I also acknowledge the staff of the University especially the academic staff for the valuable guidance, academic knowledge and moral support throughout the period I was at the University. I appreciate the knowledge imparted in me by my lecturers.

The process of research is very hectic, and since it's done towards the end of the course of study, its time consuming and demanding in terms of resources. This therefore requires a very dedicated and selfless supervisor; hence I am very appreciative of the support and guidance offered to me by Mister Dr. John Odda as my supervisor during the process of writing my dissertation.

I further appreciate my colleagues in the BNS class for their support offered to me during my time as a student in this university. Special thanks go to Bbe Jonathan for being a good friend and making the class always active, Grace Akello and Celina Lekuru as they used to bring for me drinking water and carry my laptop bag when I was pregnant.

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OPERATIONAL DEFINITION

Anaemia	A condition marked by a deficiency of red blood cells or of hemoglobin in the blood resulting pallor and wackiness.
Attack	An aggressive and violent action against a person or place
Burden	main responsibility for a task.
Intermittent malaria treatment, ITN	A net (usually bed net) designed to block mosquitoes physically that been treated with safe residual insecticide for the purposes of killing and repelling mosquitoes which carry malaria parasite.
LLIN	Is an insecticide treated net designed to remain effective for multiple years without treatment.
Malaria	Is a life threatening diseases caused by parasites that are transmitted to people through the bites of infected female mosquitoes.
Morbidity	State of being diseased disabled or in poor health.
Mortality	State or condition of being subjected to death, mortal character nature or existence.
Parasiteamia	The quantitative content of parasite in the blood of an individual.
Pregnancy	A time during which one or more offspring develops inside a woman.
Prevention	The action of stopping something from happening or arising.

LIST OF ABBREVIATION AND ACRONYMS

ANC	Antenatal Care.
IRS	Indoor Residual Spraying
ITNs	Insecticides Treated Nets
LLTNs	Long-Lasting, Insecticide -Treated Nets
RBM	Roll Back Malaria
SSA:	Sub-Saharan Africa
UBOS	Uganda Bureau of Statistic
UDHS	Uganda Demographic Health Survey
WHO	World Health Organization.

ABSTRACT

Background: Insecticide-treated bed nets (ITNs) have been shown to significantly reduce malaria-related morbidity which is one of the causes of child mortality across a range of transmission settings in Africa. With increased funding from international donors, efforts are currently underway to roll-out ITNs to vulnerable populations at risk of malaria across sub-Saharan Africa (SSA), particularly children younger than 5 years old and pregnant women.

Objective: The aim of the study was to investigate the prevalence and factors affecting acceptable utilization of insecticides treated mosquito nets among the community of Bobi Sub-county, Omoro District from October to November 2018

Method: A descriptive cross sectional study was employed to investigate the prevalence and factors affecting acceptable utilization of insecticides treated mosquito nets among the community of Bobi Sub-county, Omoro District from October to November 2018. A total of 100 community members from three parishes in Bobi sub-county were included in this study using multi stage method of sampling. A structured questionnaire was used to collect data. Data was entered and analyzed using SPSS version 20.

Results: From the assessment done, the level of utilization of the ITNs was at 64.4% among the community members. religion, marital status, level of education, occupation, number of household member, residence, number of people living in a room, household having radio or TV, family income, decision maker and availability of ITN, having ITN, number of nets in the household and knowledge on how to put the net before use every night ($P<0.05$).

Conclusion: The findings highlight the need for educational, informational and improving on the socio-economic status interventions of the respondents to address the factors that influence ITN utilization in pregnancy.

CHAPTER ONE: INRODUCTION

1.0 Introduction.

This chapter comprises of the background of the study, statement of the problem, study objectives, research questions, and significance of the study, as well as the conceptual framework.

1.1 Background of the study.

Insecticide-treated bed nets (ITNs) have been shown to significantly reduce malaria-related morbidity which is one of the causes child mortality across a range of transmission settings in Africa (WHO, 2014). With increased funding from international donors, efforts have been put to roll-out ITNs to vulnerable populations at risk of malaria across sub-Saharan Africa (SSA), particularly children younger than 5 years old and pregnant women. The Roll Back Malaria Partnership (RBM) set the target of protecting 80% of children and pregnant women at risk for malaria with ITNs by 2015 (Roll Back Malaria, 2016.)

Ownership is based on reported household ownership of an ITN, as per the DHS definition (ICF international, 2012).

The RBM indicator for coverage is 'the proportion of pregnant women who have slept under an ITN the previous night', and the coverage has been used interchangeably with overall use (WHO, 2013). There remains an unclear definition of coverage in many studies, with some studies using ownership as a proxy for coverage (assuming all nets owned are used), and others using coverage as per the RBM definition (ICF, 2012; WHO, 2013; MoH, 2015). These definitions are distinct from 'available ITN use', which is expressed as the proportion of pregnant women who have slept under an ITN the previous night, when at least one ITN was available in the household.

Universal coverage is achieved when all members of a household are protected by an ITN the previous night, at the optimal intra-household target of one ITN for every two members (MOH, 2018).

The World Health Organization (WHO, 2017) World Malaria Report demonstrated the extremely seriousness of the burden of malaria, with 216 million cases in 91 countries and 445,000 deaths, Sub Saharan Africa counting to 90% of cases and 91% deaths.

The burden is largely borne by Africa where 91% of deaths occurred; which most of the death is still in children under the age of five years. Very high concerns of malaria in pregnancy include maternal anemia, stillbirths, low birth weight and intra uterine growth restriction (WHO, 2011).
In Uganda, malaria is a major public health problem associated with slow socio-economic development and poverty and the most frequently reported disease at both public and private health facilities in Uganda (MOH, 2016).

Clinically diagnosed malaria is the leading cause of morbidity and mortality, accounting for 30-50% of outpatient visits at health facilities, 15-20% of all hospital admissions, and up to 20% of all hospital deaths. 27.2% of inpatient deaths among children under five years of age are due to malaria. A significant percentage of deaths occur at home and are not reported by the facility-based Health Management Information System (HMIS) (MOH, 2016).

The Ugandan government under the MOH together with other foreign organizations has put in a lot of initiative to stop malaria by funding annual malaria prevention days by giving out free long lasting ITNs to every member of a given household to try eradicating malaria out of Uganda with the current free distribution of over 26 million ITNs to all the households in Uganda (MOH, 2018).

In Uganda, malaria is endemic in approximately 95% of the country, affecting over 90% of the population of 3 million (Malaria operational plan (MOP, 2016). The remaining 5% of the country consists of unstable and epidemic-prone transmission areas in the highlands of the south- and mid-west, along the eastern border with Rwanda, and the north-eastern border with Sudan (MOP, 2016). The 2009 Malaria Indicator Survey (MIS) reported high prevalence of malaria parasites in children <5 years of age ranging from 5% in Kampala to 63% in mid northern region, with a national average of 45% (MOH, 2015)

A poor family in a malaria endemic area may spend up to 36 US dollars of the household income on malaria prevention and treatment. Industries and agriculture also suffer due to loss of person-hours and decreased worker productivity. Investors are generally wary of investing in countries where malaria rates are high, leading to a loss in investment opportunities.

Further, severe malaria impairs children's learning and cognitive ability by as much as 60%, consequently affecting the performance of Uganda's universal primary and secondary education programs (WHO, 2015).

In addition, malaria has an indirect impact on the economy and development in general. The socio-economic impact of malaria includes out-of-pocket expenditure for consultation fees, drugs, transport and subsistence at a distant health facility (MOH, Uganda Malaria Reduction Strategic Plan 2014-2020).

These costs are estimated to be between USD 0.41 and USD 3.88 per person per episode (equivalent to USD 1.88 and USD 26 per household). Household expenditure for malaria treatment is also a high burden to the Ugandan population, consuming a larger proportion of the incomes in the poorest households (MOH, 2015). On average, a Ugandan gets 4 episodes of malaria in a year if preventive measure is not used (Harris, 2011). First line drug, Coartem full dose cost 3.2USD and anti pyretic cost 0.72 USD and transport cost attached, so on average a household a minimum of 15.68USD a year per family member (WHO, 2015).

In Uganda, a cross sectional study among 491 participants selected purposively found that the proportion of children under 5 sleeping under an ITN a night before the survey increases as household wealth decreases, from 71 percent in the highest wealth quintile to 78 percent in the lowest wealth quintile. While there is little difference in children under 5 sleeping under an ITN a night before the survey by age, sex, or urban-rural residence, by region use ranges from 64 percent in South Western and Central 2 to 87 percent in North East (MoH, 2015).

In areas with stable malaria transmission, malaria parasitaemia is commonly asymptomatic during pregnancy. However, the adverse consequences of malaria infection can be substantial among both symptomatic and asymptomatic women. Effective prevention strategies and case management of malarial illness are therefore the foundation of malaria control during pregnancy (Menendez, 2016). This is the basis for which the Uganda government has started providing ITNs.

1.2 Statement of the problem.

Malaria has a significant negative impact on the economy of Uganda due to loss of workdays because of sickness, decreased productivity, and decreased school attendance. A single episode of malaria costs a family on average 9 US dollars (WHO, 2015).

Workers suffering from malaria may be unable to work for an estimated 5-20 days per episode. Given that many people are infected multiple times a year, this has substantial financial consequences to families (WHO, 2015).

The Ugandan government under the MOH together with other foreign organizations has put in a lot of initiative to stop malaria by funding annual malaria prevention days by giving out free long lasting ITNs to every member of a given household to try eradicating malaria out of Uganda with the current free distribution of over 26 million ITNs to all the households in Uganda (MoH, 2018).

To address this, the government of Uganda has put emphasis on distribution and proper use of ITNs a key mean of prevention mosquitos' bites and embarking of sensitizing the communities about the acceptable use of the ITNs by the community members.

With recent distribution of ITNs nationwide, it is expected that the malaria incidence will drop. Unfortunately, in Omoro district and particularly Bobi sub-county, 60% of all the patients who visit the health Centre are reported to have malaria, making malaria as the biggest public health issues in the community in Bobi (Bobi Sub county health report, 2017). This raises questions as to why the incidence is rising instead dropping.

Unfortunately, there is hardly any published data on utilization of ITNs in Omoro district. There is therefore an urgent need to investigate factors affecting utilization of insecticides treated mosquito nets in Bobi Sub-County Omoro District. Therefore, this research seeks to determine factors affecting acceptable utilization of insecticides treated mosquito nets among the community of selected parishes of Bobi Sub-county, Omoro District. Which are Palenga, Paidwe and Paidongo parishes.

1.3 Objective of the study.

1.3.1 Main objective.

To determine the prevalence and factors affecting utilization of insecticides treated mosquito nets among the community of Bobi Sub-county, Omoro District from October to November 2018.

1.3.2 Specific objectives.

1 To determine the proportion of family heads employing ITNs usage within the community of Bobi Sub-County, Omoro District from October to November, 2018.

2 To establish the socio demographic factors affecting utilization of insecticide treated mosquito nets among the community of Bobi Sub-County, Omoro District from October to November, 2018.

3 To determine individual factors affecting utilization of insecticide treated mosquito nets among the community of Bobi Sub-County, Omoro District from October to November, 2018.

1.4 Research questions.

1. What are the socio demographic characteristics affecting utilization of insecticide treated mosquito nets among the community of Bobi Sub-County, Omoro District from October to November 2018?
2. What is the proportion of families ITNs usage among the community of Bobi Sub-County, Omoro District from October to November 2018?
3. What are the individual factors affecting utilization of insecticide treated mosquito nets among the community of Bobi Sub-County, Omoro District from October to November 2018?

1.5 Significance of the study.

Research results are also to aid district health authorities of Omoro district and NGOs to set up valid strategies to address and promote the use of ITNs in order to decrease morbidities and mortalities as a result of malaria illnesses. To the residents of Bobi, through this research, many will discover the benefits of using ITNs and those who do not know about them will come to know the existence and the proper way of using them.

The study intends to provide data that can be used in the reduction of malaria in community by identifying the factors that influence utilization of ITNs in malaria control by the pregnant women.

The research also intends to give literature on malaria in pregnancy for further study in the same field especially the ITNs intervention and factors that may hinder use of ITNs.

1.6 Conceptual frame work.

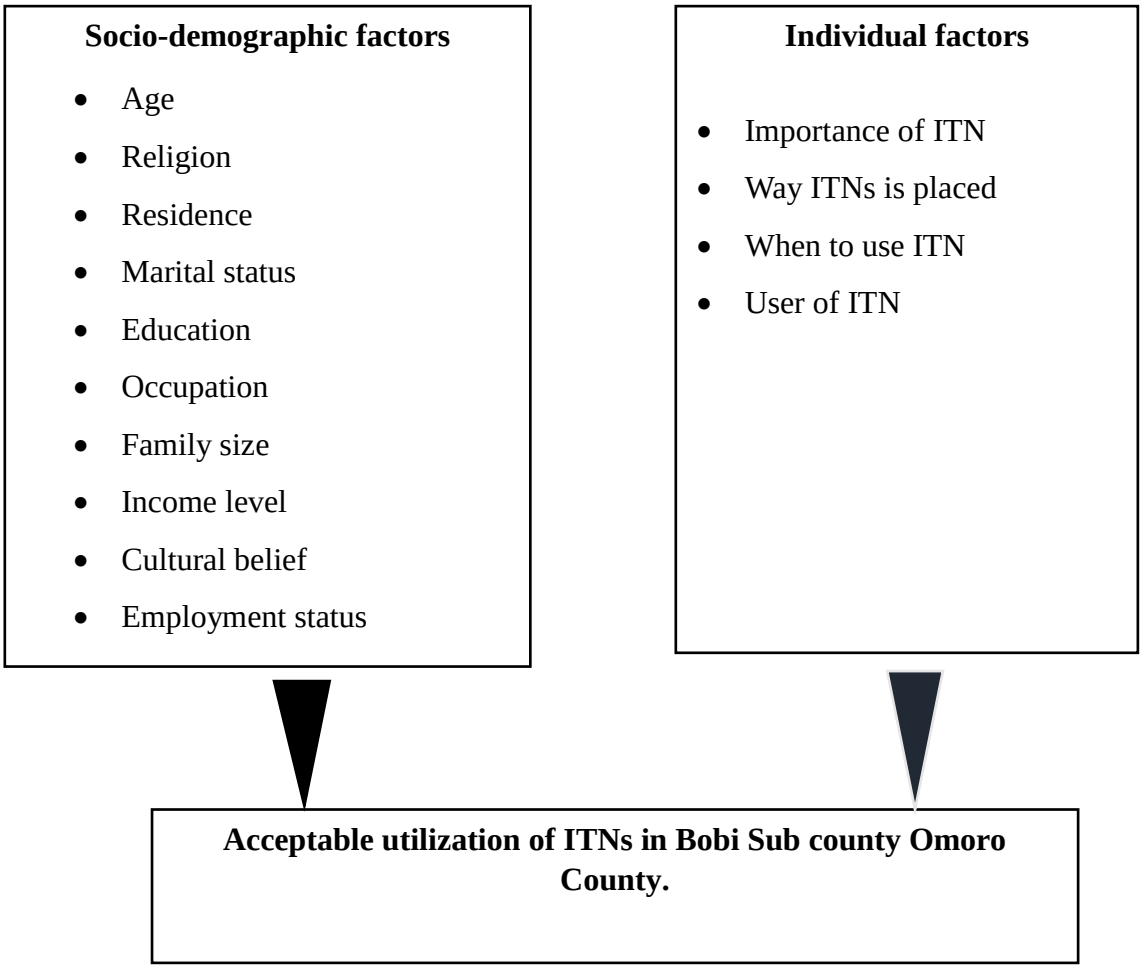

Figure 1: A conceptual framework above showing the relationship between ITNs utilization and factors affecting acceptable utilization of insecticide treated mosquito nets in Bobi sub-county, Omoro district.

1.6.1 Description of the conceptual framework.

The conceptual framework shows the independent and dependent variables of the study. The independent variables include the socio-demographic factors such as age, religion, residence, marital status, education level, occupation, Family size, income level, cultural belief and employment status; individual factors such as importance of ITN, ways ITN is placed, when to use ITN, knowledge on malaria prevention and the health facility factors such as availability of ITN services, health workers, accessibility of ITNs, attitude of the health workers and affordability of the services.

All the independent variables directly affect the dependent variable which is the acceptable utilization of ITNs by the community. The acceptable utilization of ITNs looks at the consistent use, proper set up of the net. Therefore, at the end, the study seeks the existence of the mosquito nets.

CHAPTER TWO: LITERATURE REVIEW.

2.0 Introduction.

This chapter presents the review of literature and prior studies by different authors on similar topics to the study.

This review of literature will be done in accordance with the specific objectives of the study.

2.1 Utilization of ITNs.

A cross sectional study stated that the proportion of households with pregnant women in Ethiopia covered at least by one ITN in 2016 was 59%, a little less than the 60% of the target set by the African Summit on RBM for 2015 (WHO, 2010), but a surprising achievement over earlier findings of 6–13% coverage (Jima et al., 2015; Central Statistical Agency (Ethiopia) & ORC Macro (2016); Deressa et al., 2013). The coverage of households by at least one ITN in Tigray region (Ethiopia) for 2015–2016 was estimated at 38% (Tigray Region Health Bureau unpublished report 2015–2016. In the study area, there was little difference between rural and urban site households in ITN coverage.

A cross sectional study in Northern Ethiopia 90.6% were from rural areas and whether someone come from the rural or urban setting was stated to have an association with ITN usage in Ethiopia (Mebrahtom, 2013). Magesa et al., (2015) observed that a higher proportion of pregnant women in Nigeria live in rural areas. It was found that pregnant women in rural areas were more likely to own ITNs (apparently as a result of mass community level distribution), in terms of use, pregnant women in urban areas are nearly twice as likely to use.

This seems to suggest that a higher proportion of women in rural areas who own bed nets do not use them or use them but not appropriately. In his study on determinants of use of insecticide-treated nets among pregnant women in Nigeria, it was also found that some significant differences exist between rural and urban locations, (Ezire, 2014).

About 58% of the pregnant women slept under an ITN; this proportion was lower in rural (57%) than urban sites (76%). Proper use of ITNs has been a challenge for malaria control in many countries in SSA (Korenromp et al., 2013).

In Uganda the average number of nets per household is three and 70.6% of households have one net for every two members in urban areas (MOH, 2016).

(Pettifor, 2014) survey on Free distribution of insecticide treated bed nets to pregnant women in Kinshasa: an effective way to achieve 80% use by women and their newborns among households in which a net was present, women in the poorest households were more likely to use a net during pregnancy than those in households that were less poor. Owning more than 1 net was associated with nearly a two-fold increased likelihood of using a net in pregnancy. Women whose household owned two or more nets during pregnancy were slightly more likely to always use a net compared to women who owned 1 net (Pettifor, 2014). It has been reported in a study on Long-lasting insecticide-treated net usage in eastern Sierra Leone, the success of free distribution that the cost of ITNs and their relative non-availability for purchase at local vendors are a major deterrent of ITN ownership and subsequent use across Africa. Indicators of wealth status have been investigated as correlates of net usage during pregnancy (Moon el at., 2016).

2.2 Socio-demographic factors.

The socio-demographic factors proposed in this study include; age, religion, residence, marital status, education, occupation, family size and income level as detailed below.

Regarding age, a number of studies have shown that age was significantly associated with ITN use among pregnant women for instance, in Tanzania, a cross-sectional study among 253 randomly selected women found that women 30 years or older were nearly 4 times more likely to use a net compared to women less than 20 years and women 20–29 years were 2.5 times more likely to own a net compared to women less than 20 years (Mubyazi et al., 2010).

In Juba the highest proportion of ITN users were reported in the 32-38 year-old group in a cohort study among selected households (Amwayi et al., 2011). In Ethiopia a cross sectional study by Mebrahtom et al, 2013 reported that mean age of the respondents was 26.8 (±6.3) years. The highest proportion of ITN users were in the >25 year-old group (Hills et al., 2013).

In Africa, a systemic review found that children under-five mortality among children who sleep under treated bed nets is about 18.8% lower than among children who do not sleep under treated bed nets. While health facility delivery was found to reduce under-five mortality, child bearing among older women is detrimental to the survival of the child (WHO, 2015).

A cross-sectional study in Sudan on ITN utilization, a total of 861 participants was randomly selected. The study noted that as far as religion is concerned it has been found to affect ITN use, among ITN owners, women of Muslim religion were slightly less likely to always sleep under an ITN (Laura et al, 2012).

Women from Christian backgrounds are more likely to own and sleep under ITNs than their counterparts from other religious backgrounds, though the later was not significant.

In a household population based prospective cohort study by Mebrahtom et al., (2013) on Use of insecticide treated nets by pregnant women and associated factors in a pre-dominantly rural population Brazilian town where 537 participants were included fund that Orthodox Christianity (65%) and Islam (34.5%) were the main religious denominations.

In Europe, of the 5,138 individuals who participated in the cross-sectional survey, 4,966 (96.6%) were women. Catholic, protestant, and charismatic churches were the most commonly reported religious affiliations. The majority of participants lived in urban areas (61.6%), and had a low socioeconomic status (42.5%), (WHO, 2016).

In Uganda, the Muslim caretakers were twice more likely than the Catholics in using ITNs to prevent malaria from affecting their children. However, the reverse pattern is true in treatment seeking behaviour where Muslims were 59% less likely than Catholics to seek malaria treatment for children (Ndugga Patricia, 2014).

Regarding residential places, a study reported by WHO in 2016 indicated that Europe, of the 5,138 individuals who participated in the survey, 4,966 (96.6%) were women. The majority of participants lived in urban areas (61.6%), and had a low socioeconomic status (42.5%), (WHO, 2016).

In respect to residence, a cross-sectional study from Malawi among the 528 respondents found that coverage of ITNs ownership by households after a social marketing campaign increased to 29% in urban areas compared to 6.4% in rural areas (Holtz, 2012).

Marital status in different studies were found to have a no significant influence on the ITN use, (Ezaemal et al., 2013) reported that 191(95%) of the women in a cross sectional study were married and marital status had no statistical significance with usage of ITNs. Marital status was found to have no association with net usage (Nganda et al., 2014). A study among pregnant women found that ninety-two per cent of study participants were married, 4.4% single and the rest were either widowed or divorced (Mebrahtom, 2013). In a study in Nigeria on The use of Insecticide Treated Nets among Pregnant Women in Nigeria, it was reported that 191(95%) were married, 150 (74.6%) had attained tertiary education and 137(68.2%) were multigravida while 64(31.8%) primgravida. There was no statistical significance between marital status (P=0731, Parity (P=0.538), level of education (P=0.269) and usage of ITNs (Ezaemal et al., 2013).

A cross-sectional study found that there was no association between educational level and use of ITN (Nganda et al, 2014). In Nigeria, Ezaemal et al., (2013) reported that and 150 (74.6%) had attained tertiary education and no statistical significance existed between level of education (P=0.269) and usage of ITNs (Ezaemal et al., 2013). However, in others study, the highest proportion of ITN users were among women who were currently enrolled or had obtained the secondary or high school level of education, enrollment in higher education or attaining secondary level of education was found to determine ITN usage (Hills et al, 2013)). Other studies have shown that educational level positively influences care seeking behavior and use of ITN in pregnancy. A prospective study of pregnant women among Ethiopian women showed that higher educational attainment and residence in urban location were significant predictors of ITN use in pregnancy (Chukwuocha, 2010).

A study however showed no significant influence of educational attainment on ITN at both bivariate and multivariate levels suggesting the likely dominance of yet unclear, socio-cultural covariates of education in our setting confirmed as a predictor of ITN use (Dike, 2016).

The logistic regression analyses indicated higher educational attainment as a statistically significantly positive explanatory factor for the use of ITNs among pregnant women. Extrapolation of these results to the rural areas of Ethiopia, where about 85% of the population live with lower educational status, implies that ITN usage in these areas of the country is even lower (Laura et al., 2013). Many studies in Africa have established the positive relationship between education and improved use of ITNs and other vector control measures (Dike, 2016; Onwujekwe et al., 2016). This suggests that higher level of education may be required to impact upon the uptake of malaria prevention and control interventions. Those with at least secondary education and those without, such that the higher ones level of education, the less likelihood of using an ITN/LLIN. In terms of messages to be reinforced and skills to be built, we found messages on knowledge that the use of an ITN/LLIN can protect a pregnant woman from malaria and skills on how to hang or use a net to be very significant (Ezire et al., 2013).

Occupation, eemployment status/occupation in most studies are related to educational level and it is found to have an effect on the way pregnant women use ITN in the community. Amwayi et al., 2011 in their cross-sectional study on preventing malaria during pregnancy: factors determining the use of insecticide-treated bed nets and intermittent preventive therapy, women who were formally employed and who were better educated had higher ITN use than women in the informal sector or with poorer education.

This might be because the formally employed women have regular incomes and were more able to buy ITN. Those with a higher household income also had high ITN use.
Formally employed women are likely to be better educated and hence know more about preventing malaria. Women with secondary education, or whose husbands had a university education, were also higher users of IPT. The most common occupations of pregnant women and their spouses were housewives (88%) and farmers (74%), respectively. Furthermore, occupation was independently associated factor to ITN use with being a student/ unemployed negatively associated to ITN use (Exavery, 2014). Women who are dependents are more likely to sleep under ITNs than their counterparts who engage in at least one type of employment (Yusuf, 2013).

Income level, Socio-economic factors especially income level of a household is always linked to not using ITN due to the fact where the net is not freely distributed, such family cannot afford to get a net hence not using it.

Having a lower wealth status was associated with use of a bed net during pregnancy (OR: 2.5; 95% CI: 1.4, 4.7) (Gikanda, 2013) whereas ownership of a radio (suggestive of a higher wealth status) was associated with net using.

The commercial sector was also an important source of ITNs in Kenya (Guyatt, 2014; Hamel et al. 2011) and Tanzania (Magesa et al., 2015). Socioeconomic risk factors (Carme et al, 2014) where it was shown that the poorest households had poorer access to the tools for preventing malaria than richer ones. A low income was negatively associated with ITN use. On income status, a study by Mbonye, 2016 in Uganda identified recurring themes among women related to bed net usage during pregnancy and barriers to bed net use including cost, lack of hardware to hang bed nets and high ambient temperatures.

The study also revealed that several challenges have been identified while seeking health care for malaria (and other illnesses) in Uganda. The challenges include travelling long distances to health facilities and regular stock out of ITNs (Mbonye, 2016).

Wealth, healthcare and education have a great impact on ownership and usage of ITNs (John Heggenhougen et al., 2013) cited in (Bosco Bashinyora, 2010). The growing gap between the rich, and poor, increase in marginalization, and increased numbers of people living below an absolute poverty line is now the main cause of concern as to why malaria morbidity and mortality has increased. In fact, the health of the growing population does not improve unless poverty and increasing inequality have been reduced and therefore, this calls for the effort to control malaria on a wider scale.

A mega-analysis of household surveys on utilization and ownership of mosquito nets showed a big gap that existed between mosquito net possession and usage. All this attributes to the persistent virtual direct impact that Socio-economic factors have on influencing utilization of insecticide treated mosquito nets (Binka, 2017 cited in John Bosco Bashinyora, 2010). Age, education, size of household and ethnicity are the demographic characteristics which also influence the use of ITNs.

Study's findings indicated that the symptoms of malaria among pregnant women were well-known (Yeneneh et al., 2013; Deressa et al., 2013). This has obvious importance from a program and policy point of home-based management of malaria (WHO, 2015), as early recognition and treatment for malaria by mothers of under-five children significantly reduces all-cause under-five mortality (Kidane & Morrow, 2010).

About 65% of the study participants in the study reported ITNs use and other preventive measures of malaria, and <15% reported indoor residual house spraying or otherwise environmental modification to prevent malaria. In Uganda Richard Ndyomugyenyi, 2015, Health facility Utilization changes during the introduction of community case management of malaria in South Western Uganda. Unfortunately, there is an increase in malaria infection in Bobi sub county Omoro district and there is no data to support the statement and there need to research.

2.3 Individual factors.

Proposed in this study include; Ownership of ITNs, Importance of ITNs, Way ITNs is placed when to use ITNs, User of ITN and Knowledge on malaria prevention and transmission.

The 2015 Ethiopia Demographic and Health Survey report revealed that only about 6% of the households in Ethiopia owned mosquito nets, with high variability between urban (11%) and rural (5%) areas (Central Statistical Agency (Ethiopia) & ORC Macro (2016). Mosquito net ownership was highest in the Gambella Region (31%) and lowest in Addis Ababa (1%).

Although the coverage and use of ITNs in the country is limited by lack of sustainable distribution of nets, seasonality of malaria, poor knowledge of an association between mosquitoes and malaria [National Strategic Plan (2011–2015) unpublished review document 2016].

ITN distribution has been massively scaled-up since 2015 with support from the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM).

A survey on household ownership and use of insecticide treated nets among target groups after implementation of a national voucher programme in the United Republic of Tanzania show that despite the proportion of households that own an ITN increased to 65% in one study, the use of ITNs among currently pregnant women the night before the survey in that study was only 23% (Hanson et al., 2014). There have been recent efforts to increase access to ITNs through mass distribution programs but there are concerns that ITN utilization may still lag behind access as has been severally reported. Several community level studies have identified poor perceptions about, and low use of ITNs in several African countries including Ghana (Ahorlu et al., 2017), Tanzania (lines et al., 2017) and Nigeria (Brieger et al., 2016).

A study on Factors influencing utilization of insecticide treated nets in malaria prevention and control among women in Msambweni district, Kwale County, Kenya revealed that there was significant association between the prevention measure used and ITNs use. The study finding also stated that prevention method qualities, side effects in preventive measures and mounting knowledge, household bed nets, reasons for inconsistent use, bed net sources, net retreatment, teaching on net use and household head net use promotion were significantly associated with ITN use in the study population (Mutemi et al., 2011).

A recent synthesis of coverage data estimates that 23 million pregnancies in sub-Saharan Africa were unprotected by ITNs in 2017 (van Eijk et al., 2011). The 2014 Malaria Indicator Survey in Uganda reports 53.7% of pregnant women slept under any mosquito net the night before the interview (an increase from 24 percent in 2016), and 43.7% slept under an ITN (an increase from 10 percent in 2016) . Although, among pregnant women who owned an ITN, the prevalence of usage the night before the survey increased to 77% (UBOS, 2010).

Mutemi in his cross sectional study on Factors influencing utilization of insecticide treated nets in malaria prevention and control among women in Msambweni district, Kwale County, Kenya revealed that there was significant association between the prevention measure used and ITNs use. The study finding also stated that prevention method qualities, side effects in preventive measures and mounting knowledge, household bed nets, reasons for inconsistent use, bed net sources, net retreatment, teaching on net use and household head net use promotion were significantly associated with ITN use in the study population (Mutemi et al., 2011).

In this population-based sample of 500 recently pregnant women in Jinja, Uganda, self-reported ITN ownership was common, as was self-reported ITN usage throughout pregnancy, with 73% of women who owned an ITN reporting that they always used it throughout pregnancy.

It was further stated that only 11% of ITN owners said they never used the net anytime during pregnancy. 56% were adherent throughout pregnancy. Reasons for ITN adherence were not well predicted by the characteristics ascertained in this study. Among ITN owners, women of Muslim religion were slightly less likely to always sleep under an ITN and women who owned two or more nets were slightly more likely to consistently use an ITN during pregnancy.

The prevalence of ITN usage among women in Jinja district appears to be similar to that of other pregnant women in Uganda (Laura et al., 2012).

Regarding knowledge of malaria prevention and transmission. A cross sectional study in Nigeria on the use of Insecticide Treated Nets among Pregnant Women in Nigeria, it was reported that whereas 155(77.1%) were aware that insecticide treated nets (ITNs) could prevent malaria in pregnancy, only less than half 91(45.39%) of them were using ITNs (Nuwabweze, 2015). Their major source of information about ITN's was at the ANC. 71(35.3%) of pregnant women were in possession of ITNs.

Constraints to the use of ITNs were 98(48.8%) and included not using ITNs because of the heat they experienced under the ITNs, 64(31.8%) reported fear of the chemicals used in treating the net, 24(11.9%) indicated non-availability of ITNs and 17(8.5%) lacked knowledge on how to install the nets. Measures to increase the use of ITNs by respondents included: the majority 91(45.3%) indicated the increase in ITNs awareness campaign, 74(36.8%) increase availability of nets, and 46(22.9%) indicated the need for increased education on how to install the net (Ezaemal, 2013). A study revealed that women studied knew about ITNs. Majority learned about the ITNs during ANC.

This finding confirmed the efficacy of regular health education/information the women accessed during antenatal clinic visits. The practice of disseminating health information is the norm in all formal health facilities in the country and such should be encouraged.

The study further explained that knowledge of the women acquired through ANC information has a huge effect on the usage of ITN among the studied women Abasiattai (2014) and Karunamoorthi et al. (2010).

Awosan, and colleagues (2013), in a cross sectional study to determine the prevalence and barriers to the use of insecticide-treated nets among pregnant women attending ante-natal clinic in a Specialist Hospital at Sokoto, reported that more than two-thirds of the respondents in a study had good knowledge of ITN use for malaria prevention. However, in a hospital-based study about awareness of ITN use in Abeokuta, Southwest Nigeria, (Runsewe-Abiodun, Iyabo & Christy, 2012) reported low awareness and linked this to the low utilization among the pregnant women interviewed.

The current ongoing aggressive public health campaign which involves mass distribution of ITNs at PHC centers could account for the high awareness noted in this study.
However, some respondents had poor attitudes and misconceptions about the use of ITNs. The respondents' attitudes may have a strong implication on ownership and utilization of ITNs (Onwujekweetal, 2015).

The findings of a study, across rural and urban areas, indicate that knowledge about the mode of transmission and preventive measures of malaria among pregnant women in Raya Azebo district was relatively good. Most women in the study area associated malaria with mosquito bites, (WHO,2012).

A considerable proportion also associated malaria with physical contact with a malaria patient, eating maize or sorghum stalk, exposure to cold air or working in the sun (Laura, 2013, Yeneneh et al., 2013 Deressa, 2013, 2013; Jima, 2015). The study findings from Kenya on Malaria prevention in highland Kenya: indoor residual house-spraying vs. insecticide treated bed nets (Guyatt, 2012) and Congo Brazzaville on Cerebral malaria in African children.
In other countries in SSA where malaria is endemic, similar misconceptions prevail (Agyepong 2012; Ruebush et al., 2012; Kengeya-Kayondo et al., 2014; Klein et al., 2015; Ahorlu et al., 2017). A recent study in a rural Malawi reported that 56% of women incriminated mosquitoes as a cause for malaria (Launiala & Kulmala 2016).

The correction of such misconceptions about the relationship between mosquito bite and malaria through health education messages is very critical for the success of malaria prevention and control using ITNs.

In Uganda a cross-sectional study, 477 (62%) of the pregnant women were cohabiting. 442 (58%) of the pregnant women, among the studied variables, marital status ($p = 0.004$), ANC utilization ($p = 0.13$), suffering from malaria during pregnancy ($p = 0.019$), and knowledge of the seriousness of malaria ($p = 0.013$, no statistical significance between marital status. And uses of ITNs (WHO, 2016).

CHAPTER THREE: METHODOLOGY

3.0 Introduction.

This chapter describes the methodology that was used to carry out the study which includes the research design, study population and the area of study, sampling procedures, sample size calculation, study variables, data collection technique, data management and analysis methods, quality control, ethical considerations and plan for dissemination of the study findings.

3.1 The study design.

This research study was a descriptive cross-sectional study employing quantitative methods of data collection. This study design was suitable for this study mainly because the researcher seeks to measure the acceptable utilization of ITNs within a given point in time (short period of time).

3.2 The area of study.

The proposed study setting was Bobi-sub-county purposively chosen because it was where the prevalence of malaria has continued to remain high in Omoro despite free distribution of mosquito nets. Bobi is in Omoro district along the Kamdini–Gulu Road, approximately 27 kilometres (17 miles), by road, south of Gulu, the largest city in the Northern Region. The coordinates of the town are 2°33'16.0"N, 32°21'28.0"E (Latitude: 2.554441; Longitude: 32.357782). The sub-county has three parishes of Palenga, Paidwe and Labworomor. Palenga has 4 villages of 653, Labworomor has 6 village with population of 943 and Paidwe has six villages with a population of 707.

3.3 Study population.

The population under this study included all community members in Bobi Sub-county. Focusing on the head of the family or responsible member of the family like father, mother or guardian.

3.4 Selection criteria.

3.4.1 Inclusion criteria.

All consenting community members above 18 years were included.

Those adults who are heads of families or have lived for 6 months and more in the study area were included in the study.

Mature adult sound in the mind, and who can comprehend to Luo and /English was included in the study.

3.4.2 Exclusion criteria.

All adults in inclusion criteria who, did not consent/ those who may consent but had certain conditions such sickness, mental illness, deafness, or else blindness and any other condition that may render it difficult for the respondent to participate in the study.

Those who met the inclusion criteria but have not lived in the study area for more than 6 months were excluded in the study.

3.5 The sample size determination.

This study adopted the Kish, Liesh formula of sample size determination.

$$n= Z^2_{\alpha/2}\, p\,(1-P) / e^2$$

n= the minimum required sample size

Z = the Z-value at $\alpha/2 = 1.96$ (at $\alpha = 0.05$) ≈ 2

p = proportion of individuals who use ITNs in acceptable way in Bobi sub county. But if there is no established figure about this proportion P is taken as 0.5 by convention.

e = is the precision which is proposed to be estimated at 0.1 (Suresh, and Chandrashekara, 2012)

Therefore; $n = 2^2 \times 0.5^* (1-0.5) / 0.1^2 = 1/0.05$

Hence; n= 101 respondents.

3.6 Sampling procedures.

The study employed the multi stage method of sampling with the first step being to stratify the respondents by Parishes into clusters; Barogal, Palwo, Patek, Palenga, Labworomor and Paidwe. Sampling frame was obtained from sub county headquarters. A simple random sampling was performed on the ten wards by lottery method to get three wards. The selected wards were Palenga, Piadongo and Paidwe which were selected randomly.

From each ward the sample (households) was determined as shown in the table below. Paidwe had seven villages, Palenga had six villages and Paidongo had five villages with 438 residents. Each village within the selected ward had household which were randomly selected from which the household heads were interviewed.

Accordingly, a minimum of 100 household heads participated in the study.

To determine the number of households to be randomly selected from each ward, the following formula was used. Having selected the households, respective household heads were interviewed. Number of households selected is equivalent to the number of respondents.

n/N; where n is the calculated sample size; N=accessible population

n/N= 100/980=0.102.

The number of respondents for each category was obtained upon multiplying the accessible population for each category with 0.84 as shown in the table below.

Table 1:showing how the members of respondents was selected.

Category of respondents	**population size**	**Sample size**
Paidwe	290 x 0.102	30
Palenga	252 x 0.102	26
Paidongo	438x 0.102	45
Total	**980**	**101**

Paidwe = 290/980x100 = 29.59 (30)

Palenga = 252/980x100= 25.7 (26)

Paidongo= 438/980x100=44.6 (45)

3.7 Study variables.

The dependent variable of the study was utilization of ITNs in Bobi Sub county Omoro, Omoro district.

The study was guided by 2 **independent variables** which include; socio-demographic and individual factors influencing utilization of ITNs.

3.7.1 Sources of data.

(i) Primary sources. The primary sources of data were obtained from the household heads who voluntarily consented to participate in the study.

(ii) Secondary sources. Secondary sources of data were obtained from journals like MoH briefs, hospital records, text books, medical websites and newspapers reports.

3.8 Data collection technique.

The study deployed the researcher administered questionnaire during data collection where by the researcher designed a data collection tool that guided the interview of the respondents. Using this technique, the researcher interviewed the respondents by asking them specific questions on the utilization of ITNs and its associated factors in Bobi Sub-county.

3.9 Data collection Approval.

After the approval of the research proposal by the supervisor, the researcher obtained permission from Clarke International University (CIU) and then later on the Sub-county administrations that introduced the researcher to the local leaders and then respondents. The researcher then explained the purpose of the study, and obtained consent from the respondents and then used researcher administered questionnaires to obtain their responses.

3.10 Data collection tool.

The data collection was researcher administered questionnaire tool that was used for this study was a well structure pretested questionnaire with both open and close ended questions. The questionnaires had three sections; the first section composed of questions on the demographic characteristics of the respondents the second section contained questions assessing the individual factors of the respondents and the final section contained questions on acceptable utilization of ITNs. The questionnaire was also translated into the most appropriate language to ease communication, particularly English and Luo which are the languages spoken in that area.

3.11 Data management.

The researcher viewed every completed questionnaire for validity (if filled correctly and appropriately) and reliability for completeness, consistency and clarity before leaving the respondents. This ensured that no question is left un-attempted by the respondent. These questionnaires were collected, piled in a single file and recorded and then kept in safe place awaiting data analysis.

3.12 Plan for data analysis.

The data was properly coded and entered into the computer system, initially entered into excel. The data was cleaned by checking whether the respondents gave the right answer for the questions and if the data was properly coded and entered. The researcher used a computer software-SPSS version 20.0 for running the analysis and the findings were presented using charts, graphs and tables. Chi-square tests was used during bivariate analysis to determine the level of association between the dependent and independent variables of all participant interviewed with $p<0.05$ being considered statistically significant.

3.13 Quality control issues.

A pre-test of the questionnaires was to be done in Koro parish on about 30 respondents which is another area with similar characteristics like Bobi Sub county so as to check and ensure the suitability, reliability and validity of the data collection tool. Questions that were identified as not clear or irrelevant to the study was omitted respectively. Research assistants were trained and then used in the collection of data were properly trained prior to the collection of data such that they were conversant with the questionnaire and to ensure that they properly use it for effective collection of the required data.

The questionnaires that were collected were kept under lock and key immediately after the research assistants have handed them to the researcher upon returning from the research center. The researcher later on cleaned the data by checking for errors and any other inconsistencies in the collected data and thereafter enter it into the computer.

3.14 Ethical consideration.

The researcher followed the guidelines provided by International Health Sciences University by seeking permission from the University in form of a letter of authorization from both the University and leaders of Bobi Sub-county.

Also, all participants had to give informed written consent prior to their participation in the study and all information collected were confidential and only used for academic purposes.

3.15 Limitation of the study.

The principal investigators anticipate the following limitations.

Some of the community members were too busy with garden work to answer the questionnaires. This was addressed by telephoning participant to make appointment a day before interview.

The community members may fear to give the right information about on how they are using the nets.

Therefore, that may call for call for participants being interviewed at odd hours like after 5pm when they are back from the garden, and Sundays since most community members do not go to the garden on Sundays, and may require entering their houses.

3.16 Plan for dissemination of results.

The results of the study shall be disseminated to International Health Sciences University and the local authorities at Bobi Sub-county.

CHAPTER FOUR: PRESENTATION OF RESULTS

4.0 Introduction.

The results of the study are presented according to the study objectives. A total of 101 respondents were interviewed during the period of data collection. Results were presented in tables and figures.

4.1 Utilisation if ITNs in Bobi sub-county, Omoro district.

An interview to determine the proportion of ITN usage (proper or improper), respondents were interviewed on the use of ITNs.

Respondents were said to use ITNs properly if they hanged the ITNs high enough and overlapping to allow well tacking under the mattress or bed.

These results are summarized in figure 2 below.

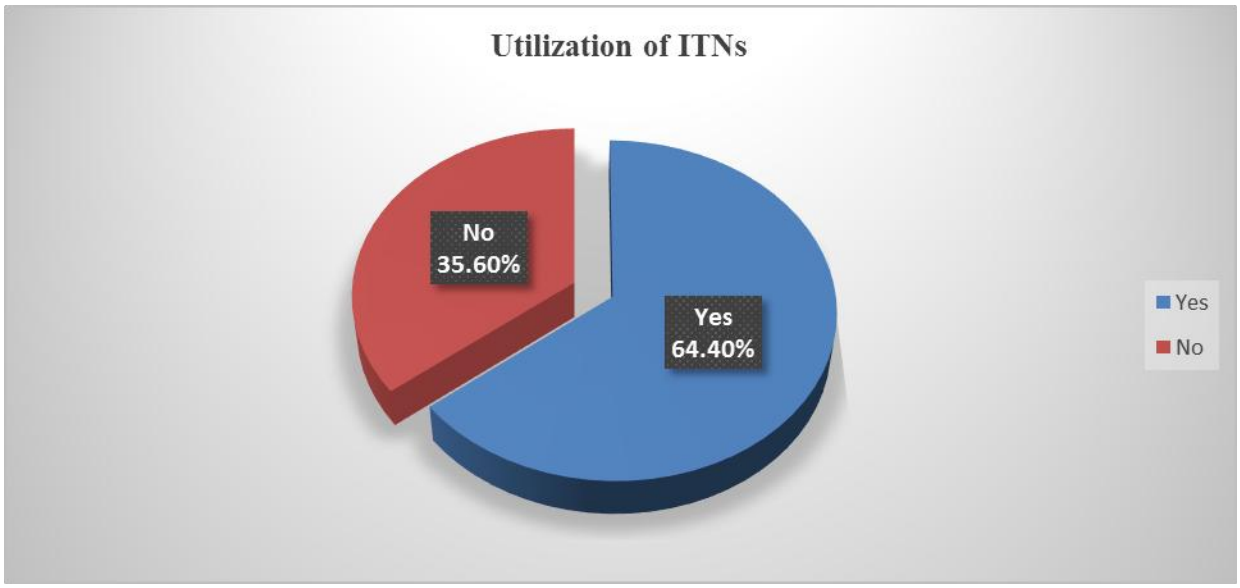

Figure 2: Showing the utilization of ITN among the community in Bobi Sub-county.

Figure 2 above shows that most of the respondents 64.4% (65/101) slept under the net the night preceding the interview.

4.2 Socio-demographic of the respondents.

The socio-demographic characteristics considered in this study based on the Univariate analysis is shown in table below;

Table 2: Demographic characteristics of the respondents' ITN utilization in Bobi Sub-county, Omoro district (N=101)

Variable	Frequency n	Percentage, %
Age in years		
18-29	58	57.4
30-39	20	19.8
40-49	16	15.8
≥50	7	6.9
Gender		
Male	41	40.6
Female	60	59.4
Religion		
Christian	46	45.5
Moslem	35	34.7
Traditional	14	13.9
Others	6	5.9
Marital status		
Married	48	47.5
Single	31	30.7
Divorced	11	10.9
Widow	8	7.9
Widower	3	3.0
Highest level education attained		
No educated	44	43.6
Primary level	38	37.6
Secondary level	13	12.9
Tertiary level	6	5.9
Occupation		
Housewife	41	40.6
Teacher	32	31.7
Farmer	17	16.8
Others	11	10.9
Head of the household		
Father	44	43.6
Mother	41	40.6
Others	16	15.8
Number of household members		
Two	24	23.8
Three to four	31	30.7
Five to six	31	30.7
More than six	15	14.9
Residence		
Urban	32	31.7
Rural	69	68.3
Number of people living in a room		
Single	37	36.6
Two to four	29	28.7
Five to six	21	20.8
More than six	14	13.9
Household own radio or TV		
Yes	55	54.5
No	46	45.5

Family level of income		
<100,000	64	63.4
100,000-500,000	26	25.7
>500,000	11	10.9
Cultural practice that prevent you from using ITN		
Yes	6	5.9
No	95	94.1
Decision maker on use the ITN		
Spouse	61	60.4
As couple	40	39.6
Pay to acquire an ITN		
Yes	9	8.9
No	92	91.1
Cost of ITN (n=9)		
<10,000	5	55.6
≥10,000	4	44.4
ITN availability		
Always	24	23.8
Most times	54	53.5
Rarely	19	18.8
Never	4	4.0

Most of the respondents 57.4% (58/101) were in the age group of 18-29 years. Nearly six in every ten respondents 59.5% (60/101) were female. Majority of the respondents 45.5% (46/101) were Christian.

Regarding marital status, most of the respondents 47.5% (48/101) were married. On highest education level attained, 43.6% (44/101) had no formal education while 37.6% (38/101) had primary education, 12.9(13/101) had secondary education while 5.9% (6/101) had tertiary education.

The majority of the respondents 40.6% (41/101) live in households headed by fathers. Regarding number of household members, majority of the household had three to four and five to six members each constituting 30.7% (31/101).

Most of the respondents 68.3% (69/101) lived in rural area. Majority of the respondents 36.6% (37/101) had one person in a room, regarding ownership of radio/TV, 54.5% (55/101) of the respondents had radio/TV in the household. Out of 101 respondents 63.4% (64/101) had family income of <100,000 shillings per month. Almost all the respondents 94.1% (95/101) had no cultural practice that prevent them from using ITN while six in every ten of the respondents 60.4% (61/101) had decision to use the ITN made by their spouses.

Majority of the respondents 91.1 % (92/101) did not pay any amount to acquire ITN while among those who paid to acquire ITN, 55.6(5/9) paid <10,000. Finally, most of the respondents 53.5% said ITN is most of the time available when they need it.

Acceptable utilization of ITNs in this study refers to using the net in the acceptable ways and it is indicated by those who demonstrated the use of net and use the net always when going to bed and those who do not always use the bed was classified as non-utilization of ITN.

To determine the relationship between acceptable ITN utilization or not, bivariate analysis was carried out. Bivariate analysis was carried out with respect to 89 respondents because 89 of these households owned nets while 12 did not have.

The results is summarized in table 2 which follows

Table 3: Showing the relationship between the socio-demographic characteristic and utilization of ITN in Bobi Sub-county, Omoro district.

variable	Proper Utilizsation of ITN (65)	Improper utilization ITN (36)	χ^2	Degree of freedom(df)	P-value
Age in years			2.260	3	.520
18-29	36(55.4%)	22(61.1%)			
30-39	14(21.5%)	6(16.7%)			
40-49	9(13.8%)	7(19.4%)			
≥50	6(9.2%)	1(2.8%)			
Religion			21.621	3	.000*
Christian	38(58.5%)	8(22.2%)			
Moslem	17(26.2%)	18(50.0%)			
Traditional	4(6.2%)	10(27.8%)			
Others	6(9.2%)	0(.0%)			
Marital status			31.151	4	.000*
Married	40(61.5%)	8(22.2%)			
Single	8(12.3%)	23(63.9%)			
Divorced	7(10.8%)	4(11.1%)			
Widow	7(10.8%)	1(2.8%)			
Widower	3(4.6%)	0(.0%)			
Highest level of education attained			30.419	3	.000*
No educated	38(58.5%)	6(16.7%)			
Primary level	12(18.5%)	26(72.2%)			
Secondary level	9(13.8%)	4(11.1%)			
Tertiary level	6(9.2%)	0(.0%)			
Occupation			13.502	3	.004*
Housewife	31(47.7%)	10(27.8%)			
Teacher	13(20.0%)	19(52.8%)			
Farmer	11(16.9%)	6(16.7%)			
Others	10(15.4%)	1(2.8%)			

Head of the household			2.067	2	.356
Father	31(47.7%)	13(36.1%)			
Mother	23(35.4%)	18(50.0%)			
Others	11(16.9%)	5(13.9%)			
Number of household members			17.407	3	.001*
Two	22(33.8%)	2(5.6%)			
Three to four	12(18.5%)	19(52.8%)			
Five to six	22(33.8%)	9(25.0%)			
More than six	9(13.8%)	6(16.7%)			
Residence			8.183	1	.004*
Urban	27(41.5%)	5(13.9%)			
Rural	38(58.5%)	31(86.1%)			
Number of people living in a room			17.407	3	.001*
Single	32(49.2%)	5(13.9%)			
Two to four	12(18.5%)	17(47.2%)			
Five to six	15(23.1%)	6(16.7%)			
More than six	6(9.2%)	8(22.2%)			
Household own radio or TV			7.590	1	.006*
Yes	42(64.6%)	13(36.1%)			
No	23(35.4%)	23(63.9%)			
Family level of income			22.443	2	.000*
<100,000	51(78.5%)	13(36.1%)			
100,000-500,000	7(10.8%)	19(52.8%)			
>500,000	7(10.8%)	4(11.1%)			
Cultural practice that prevent you from using ITN			.015	1	.903
Yes	4(6.2%)	2(5.6%)			
No	61(93.8%)	34(94.4%)			
Decision maker on ITN use			4.059	1	.044*
Spouse	44(67.7%)	17(47.2%)			
As couple	21(32.3%)	19(52.8%)			
Payment to acquire an ITN			2.592	1	.107
Yes	8(12.3%)	1(2.8%)			
No	57(87.7%)	35(97.2%)			
cost of ITN			1.406	1	.236
<10,000	5(62.5%)	0(.0%)			
≥10,000	3(37.5%)	1(100%)			
ITN availability			7.971	3	.047*
Always	21(32.3%)	3(8.3%)			
Most times	30(46.2%)	24(66.7%)			
Rarely	11(16.9%)	8(22.2%)			
Never	3(4.6%)	1(2.8%)			

Degree of freedom,

(R-1)(C-1)

(4-1) x1.

Based on the results of the bivariate analysis summarized in table 2 above, the socio-demographic factors significantly associated with ITN, religion, marital status, level of education, occupation, number of household member, residence, number of people living in a room, household having radio or TV, family income, decision maker and availability of ITN ($P<0.05$) while age, head of household, cultural practices, payment for ITN, and cost of ITN were not associated with utilization of ITN ($P>0.05$).

4.3 Individual factors of respondents in *Bobi Sub-county, Omoro district*

Results regarding ownership of ITN is presented in figure 2 below.

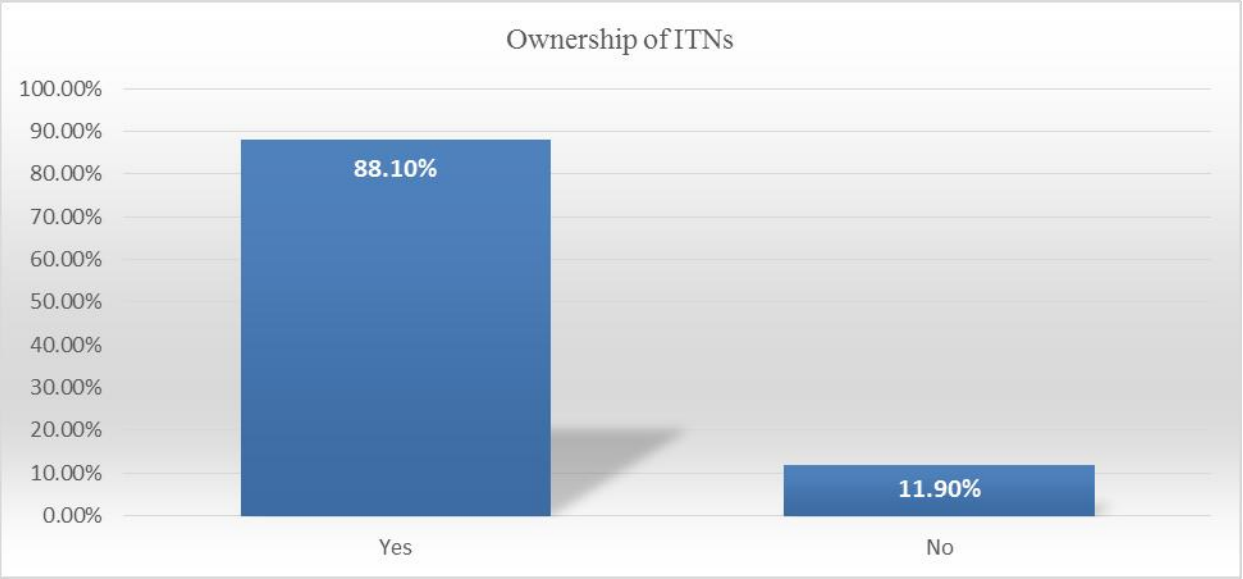

Figure 3: Showing the ownership of ITN among the study participants in Bobi Sub-county, Omoro district.

To assess individual factors of the respondents in Bobi-sub-county, Omoro District participants were asked if they own ITNs, number of ITN owned, type of nets, retreatment, safety of nets and how to use the nets. From these results, of the 89 participants who owned nets, while 11.9% did not own the net.

4.4 Individual factors of respondents in *Bobi Sub-county, Omoro district*

Table 4: Individual factors of the respondents in Bobi Sub-county, Omoro district (N=101)

Variable	Frequency n=101	Percentage, %
Do you have ITNs in your household		
Yes	89	88.1%
No	12	11.9%
Number of nets in the household (n=89)		
One	34	38.2
Two	23	25.8
Three	20	22.5
More than three	12	13.5
Type of net		
LLINs	85	84.2
Non-LLINs	16	15.8
Retreatment of current nets		
Yes	11	10.9
No	90	89.1
ITN is useful in prevention of malaria		
Yes	72	71.3
No	29	28.7
ITNs is safe to use throughout your life time		
Yes	66	65.3
No	35	34.7
Knowledge on how to put the net before use every night		
Yes	**57**	**56.4**
No	**44**	**43.6**
Demonstration of how to always put your nets before use		
Demonstrated	**33**	**32.7**
Not demonstrated	**68**	**67.3**

Of the 89 participants who owned the nets, 38.2% had only one ITN in the households

Most of the respondents 84.2% (85/101) had LLINs while 89.1% (90/101) had not retreated their current nets in use while 71.3% (72/101) said the ITN is useful in prevention of malaria, most of the respondents 65.3% (66/101) said ITN is safe to use throughout their life time.

Most of the respondents 56.4% (57/101) knew how to put the net before use every night though only 32.7% (33/101) of the respondents were able to demonstrate how to always the nets before use.

To determine the association between individual factors and factors affecting acceptable utilization of ITN. Bivariate analysis was carried out with respect to 89 respondents because 89 of these households owned nets while 12 did not have. The results is summarized in table 5 which follows:

Table 5: Showing the relationship between individual factors and utilization of ITN in Bobi Sub-county, Omoro district.

Variable	utilized	non utilized	χ^2	Degree of freedom(df)	P-value
Having ITNs			5.714	1	.017*
Yes	61(93.8%)	28(77.8%)			
No	4(6.2%)	8(22.2%)			
Number of net in the household			18.417	3	.000*
One	30(46.2%)	4(11.1%)			
Two	11(16.9%)	16(44.4%)			
Three	17(26.2%)	7(19.4%)			
More than three	7(10.8%)	9(25.0%)			
Type of net			3.519	1	.061
LLINs	58(89.2%)	27(75.0%)			
Non-LLINs	7(10.8%)	9(25.0%)			
Retreatment of current nets			2.270	1	.321
Yes	9(13.8%)	2(5.6%)			
No	56(86.2%)	34(94.4%)			
ITN is useful in prevention of malaria			2.830	1	.093
Yes	50(76.9%)	22(61.1%)			
No	15(23.1%)	14(38.9%)			
ITNs is safe to use throughout your life time			2.270	1	.321
Yes	9(13.8%)	2(5.6%)			
No	56(86.2%)	34(94.4%)			
Knowledge on how to put the net before use every night			9.399	1	.002*
Yes	44(67.7%)	13(36.1%)			
No	21(32.3%)	23(63.9%)			

Table 5 above shows the bivariate analysis of the individual factors in relation with utilization of ITN.

The individual factors that were associated with utilization of ITNs were having ITNs, number of nets in the household and knowledge on how to put the net before use every night ($P<0.05$) whereas type of the net, retreatment of the net, belief on net in prevention of malaria, safety of net and demonstration of how to put the net before use were not associated with utilization of ITN ($P>0.05$). On the other hands safety of net were not associated with utilization of ITN ($P>0.05$).

CHAPTER FIVE
DISCUSSION OF RESULTS

5.0 Introduction.

This chapter discusses the research findings in relation to the problem statement, literature review of studies conducted elsewhere and in line with the specific study objectives. It also explains the obtained results from the study.

5.1 Proportion of proper utilization of ITNs.

The study found that the proportion of proper utilization of ITN was 64.4%, this percentage is just moderately high and not yet very impressive. Much as there is mass distribution of net by the ministry of health as a strategy to prevent malaria allowing every household member to have a net boosting its use. The proper utilization of the ITNs are not yet to the expectation of the service providers as evidenced by high rise in malaria cases.

This is in line with MOH, (2015) who stated that the proper use of ITN ranges from 64 percent in South Western and Central 2 to 87 percent in North East. In addition, Korenromp et al., (2013) found that 58% of the pregnant women slept under an ITN; this proportion was lower in rural (57%) than urban sites (76%). This implies that there is still huge need to sensitize people on the proper use of nets every night to prevention malaria using the community appropriate information means that reaches all the community.

MOH, March 2018 concludes mosquito nets distribution company, and the president of the republic of Uganda stated that some people are using mosquito nets as wedding gowns, some people using it for fishing and some are using it for tying goats in the villages.

5.2 Socio demographic factors affecting acceptable utilization of insecticide treated mosquito nets.

The study found that 45.5% of the respondents were Catholics and religion was significantly associated with utilization of ITN ($P<0.05$). This is probably because religious teaching influence healthy practices such as ITN use and the fact that religious leader are passing the information regarding ITN use among other health information.

This is consistent with (Laura et al, 2012) in cross-sectional study in Sudan who found that religion to some extend it has been found to affect ITN use, among ITN owners, women of Muslim religion were slightly less likely to always sleep under an ITN .

Similarly, Yusuf et al. (2013) who found that women from Christian backgrounds are more likely to own and sleep under ITNs than their counterparts from other religious backgrounds, though the later was not significant. This implies that there is need to involve all the difference religious leaders is fight against malaria through sending healthy communication to their congregation.

The study found that 47.5% of the respondents were married and marital status was significantly associated with utilization of ITN ($P<0.05$). This is probably because respondents who were married would probably be having to be at-least two people in the decision making process unlike the single individuals who make an individual decision on ITN use which to some extend affect the utilization of net among married couple. This is consistent with WHO, (2016) in a cross-sectional survey which stated that utilization of ITN was significantly associated with marital status ($p = 0.004$).

However, (ezaemal et al, 2013; Nganda et al, 2014 & Mebrahtom et al, 2013) cross-section study in Nigeria found no significant influence on the ITN use and marital status (P=0731). The difference could probably be because of the difference study settings and population whereas this study was among community members the comparative study was among pregnant women. This implies that people should be taught the important of using ITN to allow proper decision making when it comes to the use of ITN in the family.

The study found that 43.6% of the respondents had no formal education while level of education, was significantly associated with utilization of ITN ($P<0.05$). This is probably because more educated individuals were more likely to be informed and easily articulate information than those who had no or little education. This is in line with Chukwuocha et al, (2010) in prospective study among pregnant women in Nigeria who found that women showed that higher educational attainment was significant predictors of ITN use in pregnancy.

Similarly, Hills et al, (2013) also in his cross sectional in Ethiopia found that women who were currently enrolled or had obtained the secondary or high school level of education, enrollment in higher education or attaining secondary level of education was found to determine ITN usage. In addition, (Dike et al. 2016; Onwujekwe et al. 2016; Laura et al, 2013; Ezire at el, 2013) in the cross-sectional study in Africa found established the positive relationship between education and improved use of ITNs and other vector control measures.

However, (Nganda et al, 2014 & Ezaemal et al, 2013) who found no association between educational level and use of ITN (P=0.269). The difference could probably be because the difference in the study settings and the population this study was a community study among community members while the other study was among pregnant women. This implies that there should be community empowerment for both male and female to boost their understanding and perception of the world including use of ITN

The study found that 40.6% of the respondent were housewives and occupation was significantly associated with utilization of ITN (P<0.05). This might be because the formally employed individuals have regular incomes and were more able to buy ITN. This is in line with Amwayi et al, (2011) cross-sectional study in Ethiopia who found that factors determining the use of insecticide-treated bed nets and intermittent preventive therapy, women who were formally employed and who were better educated had significant ITN use than women in the informal sector or with poorer education, Formally employed women are likely to be better educated and hence know more about preventing malaria.

Furthermore, occupation was independently associated factor to ITN use with being a student/ unemployed negatively associated to ITN use (Exavery et al, 2014). This implies that there is need to empower the community economically to boost the income and knowledge.
The study found that 30.7% of the respondents had 3-4 and 5-6 members in the household for each and number of household member and number of people living in a room was significantly associated with utilization of ITN were significantly associated with utilization of ITN (P<0.05). This is probably because the number of people determine the number of nets needed and how to put them in cases they sleep in the same room.

This is in line with (Binka et al 2017, John Bosco Bashinyora 2010) in a mega-analysis of household surveys who stated that size of household was the demographic characteristics which also influence the use of ITNs. This calls for use of FP and empowering the community to support the family size.

The study found that 68.3% resided in rural settings, residence was significantly associated with utilization of ITN ($P<0.05$). This is probably because people in urban setting are more informed, can afford the nets and have better structure to erect the net at night since a proper net sue should not be used by more than 4 people. This is in line with (Mebrahtom et al, 2013; Magesa et al. 2015 & Ezire et al, 2014).

In Ethiopia a cross sectional study all found that whether someone come from the rural or urban setting was stated to have an association with ITN usage. In addition, Chukwuocha et al, (2010) cross sectional study in Nigeria found that residence in urban location were significant predictors of ITN use in pregnancy. This implies that people in both community whether rural or urban should be given equal information access and should as well be empowered to fight malaria.

The study found that 54.5% of the respondents own a TV/radio and household having radio or TV was significantly associated with utilization of ITN ($P<0.05$). This is probably because radio or TV are the main sources of information regarding health prevention mechanism such as use of ITN among the community studied. This is similar to Gikanda et al, (2013) who revealed that ownership of a radio was associated with net using.
This implies that family should have some source of information and the government should know the best way to send important message to the community such as community leaders as well as radio that most people have.

The study found that was family income was significantly associated with utilization of ITN ($P<0.05$). This is probably because Indicators of wealth status have been investigated as correlates of net usage as this improves the standard of living. This is in line with (Magesa et al. 2015 and Mbonye et al, 2016) in Tanzania who both stated that poorest households had poorer access to the tools for preventing malaria than richer ones.

A low income was negatively associated with ITN use Contrarily, Pettifor et al, (2014) in Kinshasa found income level, Socio-economic factors especially income level of a household is always linked to not using ITN due to the fact where the net is not freely distributed.

The difference was probably because of the difference in the study population while were completely difference whereas this study was a community study the comparative study was facility based study.

The study found 57.4% were in the age group of 18-29 years, age had no association between age of the respondents and utilization of ITN. This is probably because of the recent mass ITN distribution for all the members of the household with increased information regarding ITN. This is inconsistent with (Mubyazi et al, 2010; Amwayi et al, 201 & Mebrahtom et al, 2013) in a cross-sectional study in Tanzania who shown that age was significantly associated with ITN use.

The difference in the study finding could probably because of the difference in the study population, while this study focused on all the member in the community the comparative studies were among pregnant women. This implies that the community leaders and CHWs should encourage the members to continuing embracing the ITN use in prevention of malaria.

5.3 Individual factors affecting acceptable utilization of insecticide treated mosquito nets.

The study found that 88.1% of the respondents own nets and having ITN was significantly associated with ITN utilization ($P<0.05$). This is probably because if one had the net they will be prompted to use unlike someone who didn't have the net completely. This is supported by (Binka et al., 2017) in a mega-analysis of household surveys who showed a big gap that existed between mosquito net possession and usage.

Similarly, Pettifor et al, (2014) also found that owning more than 1 net was associated with nearly a two-fold increased likelihood of using a net in pregnancy, women whose household owned two or more nets during pregnancy were slightly more likely to always use a net compared to women who owned 1 net. This implies that all individual should provide nets either freely or at a sub-seized amount to allow possession.

The study found that 56.4% knew how to put the nets and knowledge on the respondents on how to put ITN was significantly associated with ITN utilization ($P<0.05$). This is probably because having knowledge on how to putt the net will make one feel comfortable sleeping under nets unlike when one does not know how to put the need making them less comfortable forcing them to abandoned the nets.

This is in line with Mutemi et al, 2011) in Msambweni district, Kwale County, Kenya who found that bed net sources, net retreatment, teaching on net use and household head net use promotion were significantly associated with ITN use in the study population.

Similarly, Launiala & Kulmala (2016) cross-sectional in rural Malawi found that relationship between mosquito bite and malaria through health education messages is very critical for the success of malaria prevention and control using ITNs. This implies that everyone should taught and demonstrated to how the net should be put every night before sleeping.

CHAPTER SIX
CONCLUSION AND RECOMMENDATION

6.0. Introduction.

This chapter presents study conclusions based on objectives and recommendation to relevant stakeholders.

6.1 Conclusions.

The proportion of the respondents with proper utilization of ITN was moderate at 64.4% while those who were not using the ITNs properly was at 35%.

The study found that socio-demographic factors of religion, marital status, level of education, occupation, number of household member, residence, number of people living in a room, household having radio or TV, family income, decision maker and availability of ITN were significantly associated with utilization of ITN ($P<0.05$).

Regarding the number of nets and utilization, the study found that having ITN and number of net in the household were significantly associated with ITN utilization ($P<0.05$).
The study found that knowledge on the respondents on how to put ITN was significantly associated with ITN utilization ($P<0.05$).

6.2 Recommendations.

From the findings of the study, it is therefore, recommend that;
The health worker should sensitize about how to keep in good health and shape. One of the simple ways to be healthy is prevention of malaria especially to vulnerable groups.
The community members should be equipped with enough knowledge about the use of ITNs as the main way of preventing and reducing malaria incidences in a community by the health department in the sub-county and district leaders.

In periods where ITNs are provided the village health team together with LCI should visit home to home to find out whether these ITNs are out to proper use and ensuring that the most vulnerable groups at least own an ITN.

The district may consider reviewing the ITN distribution strategy with emphasis on reaching out the less educated, poor and single women. Policy makers may consider addressing the malaria problem from a wider perspective by addressing underlying factors to ITNs utilization.

Evidence suggests that interpersonal communication through community outreach focusing on hanging nets and communicating the importance of using them is perhaps the most promising intervention to increase ITN use among ITN-owning households

Assistance on appropriate hanging of the nets, and inspecting that a net is potent and usable are also urgently important.

Further research studies are required to guide malarial control efforts. These include:

- A qualitative study to identify respective reasons for non-use of ITN among individuals who never or rarely use a mosquito net, individuals who inconsistently use a mosquito net and individuals who usually use a mosquito net, but for whatever reason do not do so at times. This is important as these respective groupings could confound informed and targeted intervention.
- A qualitative or quantitative study to explore the relationship between the numbers of household members sleeping under ITNs in a household.

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APPENDIX I: CONSENT FORM

Hello, my name is …… I am conducting a study to document utilization of ITNs in Bobi Sub-county, Omoro district. You have been chosen to take part in this study Title: Prevalence and factors affecting utilization of insecticides treated mosquito nets within selected parishes of Bobi sub-county Omoro district.

The aims of this study are:

1. To establish the socio demographic factors affecting acceptable utilization of insecticide treated mosquito nets among the community of Bobi sub county, Omoro District from June to July 2018.

2. To determine the proportion of family heads employing acceptable ITNs usage within the community of Bobi sub-county, Omoro district from June to July 2018.

3. To determine individual factors affecting acceptable utilization of insecticide treated mosquito nets among the community of Bobi sub-county, Omoro district from June to July 2018. The information will help users as a stepping stone to standardization of key aspect of use of ITNs as well as lead to better prevention of malaria and acceptable practices during ITNs usage.

All the responses you give will be kept strictly confidential by ensuring confidentiality of your identity, your response will not affect your future services at the health centre/hospital and beyond.

Consequences of participation.

If you agree, you will be ask questions about quality of services delivery and your experience in the giving quality health care. Gathered information will be entered in a computer for analysis. No personal identification information such as names will be used in any reports arising out of this research

The interview will take place at the ward where you are stationed

The interview will last about 30 minutes

Participation in the study may involve loss of privacy. Information you give will be recorded, but your name will not be used in any report.

Benefits. There will be no direct monetary benefits to you as a participant. However, the information that you provide, will help the researcher and future generation to learn about the quality of health care services delivery. This will provide the baseline data upon which policy-maker in the district and MOH so that can build on to improve ITNs utilization and emphasize recommended standardization practices of ITN use. You will not pay any amount of money to participate in this study.

Confidentiality. Personal information gathered for this study will be kept private from all other study researcher and supervisor by using participant identification number (PID). Finding to be published and presented at scientific meetings will not bear your name but participant identification number.

Risk. This is a one contact study and does not involve human sample collection therefore we expect no direct or physical harm. You may only have some inconveniences having a study staff in your house witnessing your net arrangement. You will not be paid and wages for participating in this study, and your signature below means that you have accepted willing to take part in the study.

In case of ethical concern about the study, please, contact the office of chairman LCIII of this area(0787-314 975) and Clarke International University, Faculty office, School of Nursing(0312307400)

Signature of participants…….. or Thumb print……..Date…….
Signature of interviewer…….…….. Names…….……
Date……...

APPENDIX II: QUESTIONNAIRES

Serial No……..

PART ONE: SOCIO DEMOGRAPHIC OF THE RESPONDENTS

Instruction please tick one option.

1. Age in years……

2. Religion.

Christian [ ]

Moslem [ ]

Traditional [ ]

Others ……

3. Marital status.

Married [ ]

Single [ ]

Divorced [ ]

Widow [ ]

Widower[ ]

4. Highest level of formal education attained.

No educated [ ]

Primary level [ ]

Secondary level [ ]

Tertiary level [ ]

University [ ]

5. what is your occupation.

Housewife

Teacher [ ]

Farmer [ ]

Others (specify)……..

6. The head of the household you stay in is a?

Father [ ]

Mother[ ]

Other (specify)……

7. Number of household members.

Two [ ]

Three to four [ ]

Five to six [ ]

More than six [ ]

8. Residence.

Urban [ ]

Rural [ ]

9. Number of people living in a room.

Single [ ]

Two to four [ ]

Five to six [ ]

More than six[ ]

10. Do the household own radio or TV? Yes [ ] No [ ]

11. What is the family level of income of income? …….

12. Do you have any cultural practice that prevent you from using ITN.

Yes [ ]

No [ ]

13. Who makes the decision on who to use the ITN?

Spouse [ ]

Mother [ ]

As couple [ ]

Father [ ]

Others(specify)……..

14. Do you have to pay to acquire an ITN?

Yes [ ]

No [ ]

15 if yes, how much did it cost you? ……..

16. Is the ITN available whenever you need it?

Always [ ]

Most times [ ]

Rarely [ ]

Never [ ]

PART TWO: HOUSEHOLD'S OWNERSHIP OF ITNS AND ITS USE

17. Do you have ITNs in your household? Yes [ ] No [ ]

18. How many nets do you have in household…….

19. What type of net do you have or use? LLINs [ ] Non-LLINs [ ]

20. Have you ever retreated nets currently being used? Yes [ ] No [ ]

21. Did you sleep under ITNs the previous night? Yes [ ] No [ ]

22. Do you think that ITN is useful in prevention of malaria?

Yes [ ] No [ ]

23. What influenced you most to use ITN?

Given free [ ]

Told by a doctor or nurse [ ]

Heard from radio or TV or poster [ ]

Hearing from other [ ]

Others [ ]

PART THREE: INSECTISIDES TREATED MOSQUITO NET USAGE

25 Where did you get treatment from?

CHW [ ]

Facility [ ]

26. Did you sleep under a mosquito net the previous night?

Yes [ ]

No [ ]

27. Do you know how to put the net before use every night?

Yes [ ]

No [ ]

28. Can you demonstrate how to always put your nets before use?

Net well arranged [ ]

Poorly arranged [ ]

Not done [ ]

THANK YOU FOR YOUR TIME.

APPENDIX III: MAP OF THE STUDY AREA

APPENDIX IV: INTRODUCTORY AND CORRESPONDENCE LETTER

IHSU INTERNATIONAL HEALTH SCIENCES UNIVERSITY
sanitas per scientiam

making a difference in health care

Office of the Dear, School of Nursing

Kampala, 27th June 2018

To whom
it may concern
Bobi Sub-county

CHAIRMAN L.C III
BOBI SUB-COUNTY
OMORO DISTRICT
Date: 25/06/2018

0787314975

Received and
recommended to
do the research
within the selected
Parish in the Sub-
County by us

Dear Sir/Madam,

RE: ASSISTANCE FOR RESEARCH

Greetings from International Health Sciences University.

This is to introduce to you **Adong Lillian Claudia** Reg. No. **2015-BNS-TU-034** who is a student of our University. As part of the requirements for the award of a Bachelors degree in Nursing of our University, the student is required to carry out research.

The topic of research is: **Prevalence and Factors Affecting Utilization of Insecticides Treated Mosquito Nets Within Selected Parishes of Bobi Sub county-Omoro District.**

This therefore is to kindly request you to render the student assistance as may be necessary for the research.

I, and indeed the entire University are grateful in advance for all assistance that will be accorded to our student.

Sincerely Yours,

IHSU INTERNATIONAL HEALTH SCIENCES UNIVERSITY
27 JUN 2018
SCHOOL OF NURSING
P. O. Box 7782, Kampala - Uganda

Ms. Agwang Agnes
Dean, School of Nursing

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