MISUSE OF INSECTICIDE TREATED NET AMONG HOUSEHOLD HEADS IN APETE COMMUNITY OF IDO LOCAL GOVERNMENT AREA, IBADAN, OYO STATE.

BY

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DEDICATION

This work is dedicated to my beloved parents Mr. and Mrs. Agboola. May Allah grant you long life and good health to reap the fruits of your labour (Amin).

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To all my classmates, I wish each and every one of us best of luck in our life pursuit.

Adegbore, A. K.

ABSTRACT

Malaria is a major public health concern and remains the leading cause of morbidity and mortality in sub- Saharan Africa. The use of insecticide treated net (ITN) has been shown to be the most cost effective strategy in preventing malaria. However, despite the free bed net initiatives, low uptake and use for other purposes than malaria prevention has been reported. However, not much has been done on investigating the misuse of ITN among household heads'. This study therefore examined the misuse of ITN among household heads in Apete Community of Ido Local Government Area, Oyo State, Nigeria.

The study adopted a cross sectional survey among 400 selected household heads through multi-stage sampling. A pretested interviewer- administered questionnaire was used to obtain information on respondents' socio demographic characteristics, knowledge level on ITN, ownership, utilization and perception on barriers to ITN use and misuse. The tool reliability using Cronbach's Alpha yielded 0.72. Descriptive statistics and chi-square test were used to analyze the data at 0.05 level of significance and all statistical association was computed to explain the outcome variable of this study.

The mean age of the household heads was 33.38 $\pm$ 7.46 years, and majority were female (69%). Majority belong to the middle class of wealth index (66.8%). Only 32.8% knew sleeping under ITN was the most cost effective way of preventing malaria, while 79.8% knew the correct process of hanging the net. ITN ownership at household level was high (85.5%), but personal level ownership of at least one net is low (43.9%). Respondents' utilization was relatively low as only 32% slept under the net the night prior to data collection. Above three-fifths (72.5%) misused the nets in various ways other than for sleeping. Slightly above one third of the respondents misused the ITN as window curtains (32.7%), while one – sixth used as night wrapper (15.3%). Others were used for protection of gardens (7.3%), fishing net (8.9%), cover for market goods (4.8%) and football post (6.5%). ITN misuse was most prevalent among the highly educated respondents (66.5%). Significant association was found between household head's gender and insecticide treated net misuse (X^2 = 14.980; P = 0.02) with preponderance among females.

This study confirmed misuse of ITN among household heads in the study area. There is need to embark on an aggressive enlightenment cum community outreach to re-orientate the

community members on the importance of proper use of ITN including the use of Behavioural Change Communication strategy in influencing community local associations and faith based organizations.

KEYWORDS: Misuse, Perception, Insecticide Treated Net, Household heads, Behavioural Change Communication

WORD COUNT: 415

CERTIFICATION

I certify that this work was carried out by Adegbore Abidemi Kafayat (188879), of the Department of Health Promotion and Education, Faculty of Public Health, University of Ibadan, Oyo State.

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LIST OF ABBREVIATIONS AND ACRONYMS

BCC:	Behavioural Change Communication
CDC:	Center for Disease Control
ITN:	Insecticide Treated Net
LLIN:	Long Lasting Insecticide Net
MCH/FP:	Maternal Child Health/Family Planning
MIS:	Malaria Indicator Survey
MOH:	Ministry of Health
NGO:	Non Governmental Organisation
NLLIN:	Non Long Lasting Insecticide Net
SBC:	Social Behavioural Change intervention
TDR:	Tropical Disease Research
WHO:	World Health Organization

OPERATIONAL DEFINITION OF TERMS

Misuse: An incorrect, improper or unlawful use of something

Insecticide Treated Net: An insecticide treated net is a net (usually a bed net), designed to block mosquitoes physically, that has been treated with safe, residual insecticide for the purpose of killing and repelling mosquitoes, which carry malaria (Lengeler, 2004).

Household: A household is defined as an aggregation of persons who lived together (Best Ordinioha, 2012).

Household Head: Someone responsible for decision making relating to proper wellbeing and health of the family members either (male or female) as well as the use of insecticide treated net.

CHAPTER ONE
INTRODUCTION

1.1.Background to the study

Malaria has become a serious concern for health workers and researchers globally due to its prevalence as a health risk. It ranks first, among seven other diseases initially earmarked for global control and/or eradication by Tropical Disease Research (TDR) of the World Health Organization (WHO). This is because of its morbidity, mortality, problems of diagnosis, lack of ideal drugs and effective vaccine as well as other behaviours of the vector (WHO, 2005). Strategizing and strengthening malaria eradication programs in endemic regions has however been one of the major roles being played by the body.

It has been reported that about 90% of all malaria deaths in the world today occur in Africa south of the Sahara. This is attributed to the fact that the majority of malaria infections in Africa are caused by Plasmodium falciparum, the most dangerous of the four human malaria parasites. Also because the most effective malaria vector – the mosquito Anopheles gambiae – is the most widespread in Africa and the most challenging to control. An estimation has equally shown that one million people in Africa die from malaria each year which most of these are children under five (5) years old (World Health Organization, 2000).

Malaria constitutes a major health problem with about 300-500 million clinical cases and more than one million deaths annually (Taylor, Jones and Garner, 2007). The most vulnerable to malaria morbidity and mortality are children and pregnant women. Maternal health and pregnancy outcome are equally affected by malaria. It causes anemia in pregnancy which increases the risk of maternal deaths with an estimated 10,000 maternal deaths annually attributed to maternal anemia (Mugisha, 2003). Malaria in pregnancy also causes low birth weight, preterm delivery, congenital infection, and reproductive loss. Over 90% of malaria burden occurs in Sub-Saharan Africa (Dagne and Deressa, 2011).

Malaria is a major public health concern, contributing to roughly 11% of neonatal deaths and to 25% of all maternal deaths in some parts of the world (Ricotta, Koenker, Kilian and Lynch, 2014). The World Health Organization has recommended priority interventions for

malaria during pregnancy, including use of insecticide-treated nets (ITNs), but net distribution is no longer targeting vulnerable groups but rather made universal to all.

The disease is the major cause of maternal and child morbidity and mortality annually especially in sub-Saharan Africa (WHO 1992, 2005). Pregnant women are frequently exposed to malaria resulting from the bite of female Anopheles mosquito which is the vector of malaria and some adverse effects associated with malaria in pregnant women include amongst others spontaneous abortion, low birth weight, stillbirth and anemia. Malaria control with the use of insecticide treated net has been recommended as an important component of ante-natal clinic. This is because the use of ITNs in some research carried out shows that when compared with a situation when no net was used; there was increase in mean birth weight; reduced miscarriage, still births and placental parasitaemia (Iwu, Ijioma, Egeruoh, Awurum and Ohalete, 2010).

Insecticide-treated nets (ITNs) among others are part of the central components of current malaria control campaigns (WHO, 2009). The 2005 World Health Assembly (WHA) set targets of ≥80% coverage for four key interventions, including ITNs (WHO, 2010). Because of the effectiveness of ITNs in malaria prevention, WHO recommended universal coverage (defined as one ITNs per two persons) of ITNs in 2007. More importantly, there is a need for continuous supply of new ITNs to replace those that are torn or show waning efficacy, so as to sustain high levels of coverage to effectively reduce malaria transmission in sub-Saharan Africa.

Insecticide-treated bed nets (ITNs) are known to be highly effective in reducing malaria morbidity and mortality. However, usage varies among households, and such variations in actual usage may seriously limit the potential impact of nets and cause spatial heterogeneity on malaria transmission. Nigeria and many African countries have made significant effort in subsidizing the provision of ITNs to target population but the success of malaria control is weighed down by problems of delivery, distribution, usage, misusage, and even acceptance of this method (Atieli et al, 2011).

In the 2010 World Malaria Report, net usage rates are determined by using national population surveys to compare the percentage of the population that could theoretically be protected by owned ITNs based on an assumption that each ITN protects two people with the percentage of the population that reports using an ITN.

The 2012 World Malaria Report tabulates results from national population surveys, and compares the percentage of the population that could theoretically have access to and owned ITN in their household, assuming that each ITN within a household protects two people and does not protect anyone outside of the household, with the percentage of the population that reported using an ITN the previous night. It finds slightly higher usage rates than the 2010 World Malaria Report. In 17 sub-Saharan African countries that conducted surveys from 2009-2011, the median net usage rate was 91%, with an inter-quartile range of 82%-98% usage.

In Nigeria, the 2009 – 2013 National Malaria Control Programme Strategic Plan sets universal coverage of all population groups as its goal, which is a shift from the previous goal to protect vulnerable groups only. The Strategic Plan sets 80% coverage of all households with two or more ITNs/LLINs by 2010 as its overall bed net target. It calls for an initial phase of rapid scale-up of free LLINs through mass campaigns followed by a second phase which focuses on the replacement of torn or worn out nets through routine services, free or subsidized distribution through community-based organizations, and subsidized or full cost nets distributed through the commercial sector. Sixty-three million LLINs are needed to reach a coverage of two LLINs for all households nationwide.

According to malaria indicator survey (2010), the malaria fact sheet revealed 62.9% ownership in the north east, 58.2% in the North West, 43.8% in the south south, 32.2 south east, 32.1% north central, and 20.3% in the south west. In a similar vein, results from the MIS, conducted from October to December 2010, showed significant increases in LLIN ownership and use as compared with the 2008 Nigeria Demographic health survey. The average for ownership of one ITN in 2008 was 8% and increased to 42% in 2010, with rural ownership higher (45%) than urban (33%) indicating that the mass campaigns were achieving a high degree of equity. ITN use also improved from an average of less than 6% of children

under five years using an ITN the previous night in 2008 to more than 29% in 2010. The data also revealed that this was more than a gain due to the presence of nets to use. In 2006, 50% of children under five in a household with an ITN slept under the net as compared to 59% in 2010.

However, despite the increasing use of insecticide treated net as shown in the data above, it has been reported that there is widespread use of nets for purposes other than protection against mosquitoes. The most commonly reported misuse appears to be use of ITN for fishing nets and wedding veils. The other primary misuse is that individuals given ITNs refuse to use them. This would include the misuse by those who receive free ITNs frequently turning around and selling. Reasons for this misuse includes but not limited to the misconception that the ITN is a purely Western intervention that has been forced on African communities, with little regard to local norms or cultures, which has then led to their widespread rejection, misuse, or sale, by recipients (Shaw, 2010).

Briegier (2014), posited that Kenyan people were using their ITNs to protect their gardens from pests, their kitchens from rodents, to make football goals, curtains, table clothes, and cover their market goods. Hence, a newly published study that analyzed ITN use with data from 14 sub-national post-campaign surveys conducted in Ghana, Senegal, Nigeria (10 states), and Uganda between 2009 and 2012 to find out what happens to “lost” nets. While 16% of 25,447 nets were no longer serving their original purpose, only 6.2% of those were being used for another purpose. Importantly, over 3/4 of those nets had been damaged prior to misuse. The fact that the major reason why nets left the household was because they were given to other users (e.g. relatives) implied that better assessment of community need for nets was required. What is more likely to happen, it seems is that households acquire their nets but for various reasons do not always hang them, as was the case with nearly 30% of recipients in a small study in Rivers State, Nigeria (Best Ordinioha, 2012). Malaria control programs need to pay more attention to helping people actually hang and use their nets correctly and regularly than simply being satisfied with reporting the numbers distributed.

A household head is an individual in one family setting who provides actual support and maintenance to one or more individuals, who are related to him or her through adoption, blood or marriage. He/she takes charge of decision making and goes a long way in determining the lifestyle of the family. Hence, he or she plays a pivotal role in the use or misuse of ITN in the prevention of malaria. His or her belief or idea will be acted upon by the family members. As the head of the household, he or she might consider him or herself as the sole user of the net or may forbid the whole family from using it. He/she might also use it for another purpose he/she considered more beneficial than its primary purpose. Hence, all activities in the family start and end with him/her. Thus the health status of any family is largely dependent on the periscope of the household head including embracing a health giving behaviour.

Odoemene (2013) posited that household head also go a long way in influencing the use of ITN as it was reflected in his research study done among fifty household in Ogun state. The fact is that correct and consistent use of ITN has been established to prevent malaria. Despite this fact, majority of households still divert ITN for another use they considered more beneficial than its main purpose. This attitude may be born out of the fact that household heads do not perceive malaria as a threat hence do not see any beneficial reason for its use.

1.2 Statement of the problem

Insecticide- treated nets are the most powerful malaria control tool if used correctly. Yet up to date, utilization is still very poor (Ordinioha, 2012). Hence, malaria continues to be the leading cause of child mortality and morbidity. Insecticide treated bed nets (ITNs) were introduced in Nigeria as an effective means of preventing mosquito bites and malaria transmission following the meeting of African Heads of States in Abuja, Nigeria in the year 2000 (Roll Back Malaria, 2010). Despite the concerted efforts made by the various health authorities to promote the use of ITNs, studies have shown that the level of actual use of ITNs by households heads have varied from one locality or zone to the other. In fact, observation revealed that various misuse of ITNs is now rampant among house hold heads in different localities. A case of Kenyan people was reported by Briegier (2014), which shows that people were using their ITNs to protect their gardens from pests, their kitchens from rodents, to make football goals, curtains, table clothes, and cover their market goods.

Another study done by Noboru, Gabriel, Gorge, Kyoko and Satoshi (2008) along lake Victoria in Kenya also revealed that residents of fishing villages have started to use bed nets for drying fish and fishing.

Keita Honjo and colleagues (2014) reported that ITN use for malaria prevention can be thwarted in settings of extreme poverty, where an increase in labour productivity by an alternative use can offset the perceived benefits of avoiding malaria infection. Most people in such community where ITN misuse is rampant are found to be low literate who do not see malaria as a serious threat. They perceive ITN as a discomfort rather than a life saving tool. As reported in the lake Victoria Kenyan and Uganda study, most people are involved majorly in fishing who invariably find ITN more useful in their occupation to harvesting and drying fishes than to using them for a mere trivial illness. Most community members also believe that sleeping under ITN is a western innovation which has little regards to local norms and cultures.

Reasons given for this action by villagers are that bed nets were inexpensive or free as compared to the papyrus sheets that were traditionally used previously for drying fishes. They claimed that bed nets were readily available from NGOs or local health facilities at subsidized rate as against the papyrus sheets which were only available in the weekly market in the major local town. They further stated that fish dried faster on the nets which provide greater aeration when laid on grass than did papyrus sheet. Fishes also dried straighter on bed nets which increased the commercial value of the fish. Though the study showed that both long lasting insecticidal nets (LLINs) and non long lasting insecticidal nets (NLLINs) were used for this purpose, LLINs were more used than NLLINs (239 LLINs out of 283 bed nets) because materials used for LLINs are stronger than those used for NLLINs and are more suitable for use outdoors (Noboru et al, 2008).

In the 2008 malaria journal, data and photos of ITNs used to dry fishes along the shores of Lake Victoria were documented. The root cause of this was based on the lack of coordination among agencies such that the villages were supplied more nets than they needed. However, vulnerable populations (such as the pregnant women and the children) continue to be at risk

of malaria as they are debar from using the ITNs as a means of prevention which in turn continue to increase the morbidity and mortality caused by malaria.

Household heads play an important role in day-to-day health promotion. They are important target in malaria prevention interventions. More precisely, the head ensures what each of the members of the household contributes to the healthy wellbeing of the family. This is so as enshrined in the African culture where the head of a family, clan, tribe etc is looked upon to give guidance in decision making by encouraging, tutoring and use of force when and where applicable. To a large extent, defined by gender, Headship is often used as a proxy for gender relations where a man in most cases is seen as the household head. This study assumes that headship is a meaningful analytical category, it should be investigated in a particular setting and in this contest in establishing the role they play in the misuse of insecticide treated net.

Moreover, this study equally assumes that headship is closely associated with the acquisition, ownership and use of ITNs. According to the dominant gender model in the study area, the husband provides household necessities, and the wife depends on his good will and economic ability. If women live by themselves or with children and head a household, their own skills to generate income determine their acquisition, ownership and use of ITNs.

Though most misuses of ITN found to occasionally occur in Africa are said to be based on anecdotal accounts with little evidences and myths majorly propagated by the media, none of them have proffered any solution or intervention to mitigate ITN misuse. The best that have been done are suggestions to the malaria control programme to pay more to helping people to actually hang and use their nets correctly and regularly than simply being satisfied with reporting the numbers distributed. Hence, it is against this background that this study is aimed at ITN misuse among household heads in Apete community and also recommending intervention for its mitigation.

1.3 Justification

The use of ITN in the prevention of malaria will be effective if only used correctly. Several reports have shown that people misuse ITN for various purposes all of which none has been evidence based. As more and more resources continue to be directed towards social

marketing of mosquito nets, there is need to find out how the nets are being used and develop ways of increasing their efficient use. This study, in the process of identifying the various ways of misuse will provide evidences that can be used by malaria control programme to design educational programs that will motivate household's heads to consistently and correctly use the net. This will eventually increase the efficacy of ITN in preventing malaria.

1.4 Goal

To investigate insecticide treated net misuse among household head in Apete community.

1.5 Objectives

1. To assess the knowledge of insecticide treated net use among household heads in the community.
2. To determine the ownership of insecticide treated net among household heads in the community.
3. To determine the level of ITN usage among household heads in the community.
4. To determine the perception of household heads on use and misuse of insecticide treated net.
5. To determine the prevalence of ITN misuse among household heads in the community
6. To identify factors influencing ITN misuse among household heads

1.6 Research Questions

1. What is the knowledge level of household heads on insecticide treated nets in the community?
2. What is the level of ITN ownership among household heads in the community?
3. What is the level of utilization of ITN among household heads in the community?
4. What is the perception of household heads on use and misuse of ITN?
5. What is the prevalence of ITN misuse among household heads in the community?
6. What are the factors influencing ITN misuse among household heads in the community?

1.7 Research Hypothesis

1. There is no significant relationship between relative wealth index of household heads and ITN ownership.
2. There is no significant relationship between educational attainment of household heads and ITN misuse
3. There is no significant relationship between household head's gender and ITN misuse

CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction

The intention of this chapter is to conduct a review of literature on evaluation of misuse of insecticide treated nets (ITNs). Kothari (2013) suggests that there are two types of literature - the empirical literature consisting of studies which are similar to the one proposed and the conceptual literature concerning the concepts and theories.

The literature review of this study covers both the empirical literature which discusses related studies on the variables under this study and the conceptual/theoretical framework. This literature review is organized as follows: First, an empirical review of literature covering ITNs relevance to combating malaria, ITNs invention and factors influencing ITNs invention, ITNs adoption in homes, factors influencing ITNs proper use, roles of household heads in ensuring quality of healthy living at homes and misuse of ITNs. Second, theoretical review of the adopted model covering related works that have adopted either or all of the constructs from which the proposed model for this study was adapted.

Brief introduction of the Health Belief Model theory would also be given. This review follows the suggestion of Santa (2005) cited in (Tella, 2009) that suggests that a review of relevant empirical literature should be placed in the context of its contribution to the understanding of the subject under study; should describe the relationship of each work to the others under consideration; and should identify new ways, interpret, and shed light on any gaps in previous research. Furthermore, this chapter relates to the ongoing body of literature with respect to integrated library management system adoption and use evaluation. This chapter is arranged as follows:

2.2. ITNs relevance to combating malaria

2.3 Prevalence of ITN use in Nigeria

2.4. Factors influencing ITNs intervention in Nigeria

2.5. Knowledge on ITN use

2.6. Ownership of ITN and use

2.7. Perception on ITN use

2.8. Factors influencing ITNs proper use

2.9 Barriers to net usage

2.10. Misuse of ITN

2.11. Theoretical framework

2.2. ITNs relevance to combating malaria

Previous studies such as Rajaratnam et al (2010) have documented the recent declines in mortality of infants and older children, many studies have documented the effectiveness of insecticide-bed net (ITN) in preventing malaria. A number of factors may have contributed to the broad decline in infant mortality across Sub Saharan Africa. One prominent possibility is the decline in malaria prevalence which has coincided with the scaling up of the use of insecticide-treated bed nets (ITN) and other anti-malarial interventions, including indoor residual spraying, use of more effective artemisinin based drugs, and improved diagnostic capacity at health facilities.

The decline in malaria in some parts of Africa has been documented in a number of studies, including Okiro et al (2007), Okiro et al (2009), and Okiro et al (2010). Among the interventions which may have contributed to the decline in malaria, growth in ITN usage appears to be most substantial. Several rigorous studies have shown that ITN usage prevents malaria transmission (Lengeler 2004), and one longitudinal study (Fegan et al 2007) of 3500 Kenyan children under age five found that ITN usage was associated with a 44 percent drop in mortality risk. Noor, Mutheu, et al (2009) estimate that the number of African children living in malaria-endemic conditions who were protected by an ITN grew from 1.7 million (1.8 percent) in 2000 to 20.3 million (18.5 percent) in 2007.

In the absence of effective vaccine for malaria prevention and development of unacceptable levels of resistance to one drug after another by the malaria parasite, coupled with the development of resistance to insecticides by mosquitoes that transmit the disease; prevention of mosquitoes bite through the use of insecticide treated nets remains a very important strategy for malaria control (Lengeler and Snow, 2000; TerKuile et al., 2003). Insecticide treated nets (ITNs) have been shown to reduce severe disease and mortality due to malaria in endemic regions and reduce all cause mortality by about 20% (Centre for Disease Control (CDC), 2004).

Proven effective options to reduce morbidity and mortality rate of malarial include early diagnosis, combined with prompt effective therapy and malaria prevention through reduction of human-vector contact, especially with the use of ITNs (World Health Organization, 2007).

A meta-analysis on the effectiveness of ITNs in preventing adverse maternal and fetal outcomes in Africa among pregnant women living in areas with endemic malaria concluded that the use of ITNs during pregnancy reduced placental malaria by 23%, reduced fetal loss by 32% and improved birth weight by 33 grams (Gamble, Ekwaru, Garner and Kuile 2007).

2.3 Prevalence of ITN use in Nigeria (among different geographical Zones and populations including pregnant women, Children under 5 years, and Adults).

Malaria control with the use of insecticide treated net has been recommended as an important component of ante natal clinic. This is because the use of ITNs in some research carried out shows that when compared with a situation when no net was used, there was increase in mean birth weight; reduce miscarriage; still births and placental parasiteamia (Becker-Dreps, Biddle, Pettrifor, Imble, Meshrick and Belits, 2009).

A research carried out by Iwu, Ijioma, Egeruoh, and Awurum (2010) on awareness and use of insecticide treated net among pregnant women attending ante natal clinic at federal medical centre and general hospital Owerri, Imo state reveals that the frequency of use of ITN among the 344 study populations shows that only 76 (37.4%) use their ITN on a daily basis, 104 (51.2%) used it occasionally while 23 (11.3%) did not use the net at all. This was however attributed to the fact that they were too tired, care free or forgot to do so. The study concluded that government should intensify effort in creating awareness about the benefits of ITN, through seminars, workshops and billboards. This study is also similar to the findings of Adeyemi et al (2007) where low prevalence in the use of ITN among pregnant women in southern Nigeria was revealed.

A descriptive survey conducted by Dotimi, Atibinye, Harvest, Okeke, Bibowei, Obele and Uzere (2014), on awareness and utilization of insecticide treated nets for malaria prevention in Igbomotoru community in southern Ijaw local government area of Bayelsa state, Nigeria revealed that out of the 300 participants who possess ITN in their homes (of the 400

respondents from 15years and above comprising of 160 males and 240 females), only 100 (33.3%) use the net for sleeping in the night. The study concludes that there is a need for public health personnel to organize programs that will create awareness on the purpose and utilization of ITN in the community.

In another cross sectional study done by Awosan, Ibrahim, Alayande, Isa, Yunusa, and Mahmud (2010) on prevalence and barriers to the use of insecticide treated nets among pregnant women attending ante natal clinic at specialist hospital, Sokoto, Nigeria, it was revealed that out of the 185 participants only 50 (27.6%) use ITNs and concluded that utilization of ITNs was low. The study however suggested women empowerment (through education and employment) as well as monitoring of ITNs distribution by relevant government agencies as important interventions in improving availability, affordability and use of ITNs.

Osuorah, Ezeudu, Onah and Anyabolu (2013) posited in a study on household bed net ownership and use among under 5 children in Nigeria that the rate of households bed net ownership in Nigeria is 45.5% while about 48.5% under 5 children in 33.9% of household surveyed, use a bed net during sleep. It further revealed that there was a strong correlation between households ownership and child sleeping under a bed net ($r= 0.706$, $p<0.001$). The study concluded that bed net ownership in households in Nigeria is poor and does not translate to usage.

Another study conducted by Amoran, Senbanjo and Asagwara (2011) on determinants of insecticide treated nets use among youth corps members in Edo state Nigeria, using a total sampling technique revealed that out of the 656 youth corps members interviewed only 23.8% of these youths ever use ITNs while 4.3% currently use ITN before reporting in camp. The study concluded that the use of ITNs for malaria prevention is low among these Nigerian youths.

2.4. Factors influencing ITNs intervention in Nigeria.

Malaria constitutes a major health problem with about 300-500 million clinical cases and more than one million deaths annually. Children and pregnant women are the most vulnerable to malaria morbidity and mortality. Every 40 s, a child dies of malaria resulting in more than 2000 deaths per day among children worldwide (Sachs and Malaney, 2002). Malaria affects maternal health and pregnancy outcome. It causes anemia in pregnancy which increases the risk of maternal deaths with an estimated 10,000 maternal deaths annually attributed to maternal anemia. Malaria in pregnancy also causes low birth weight, preterm delivery, congenital infection, and reproductive loss (Pell, Straus, Andrew, Menaca and Pool, 2011). Over 90% of malaria burden occurs in Sub-Saharan Africa (Dagne and Deressa, 2008).

Malaria is endemic in Nigeria, with a prevalence of 919 per 100 000 population and remains one of the leading cause of morbidity and mortality. It accounts for 30% and 11% of child and maternal deaths, respectively. The economic impact of malaria in Nigeria is enormous with about ₦132 billion lost annually (A road map for impact on malaria in Nigeria, 2006). Insecticide-treated nets (ITNs) have been shown to be the most cost effective measures in the prevention of malaria. ITNs have been shown to reduce malaria mortality by 17% in children below the age of five (Lengeler, 2004). In view of the effectiveness of ITNs, the Roll Back Malaria Partnership (RBM) targets to protect 80% of children and pregnant women at risk for malaria with ITNs by 2015 (Eisele, Keating, Littrel, Larsen and Macintyre, 2009). Nigeria, has also established policy guidelines for the implementation and scaling-up use of ITNs in accordance with the provision of Abuja declaration and its national strategic plan (Abebe, 2003). The Malaria prevention programme in Nigeria was expected to provide about 60 million ITNs by the end of 2010 (Malaria prevention program in Nigeria aims at universal bed net coverage, 2009). Consistent use of these nets is important in the prevention of malaria.

Some demographic factors have been identified as important predictors of ITNs use including gender, wealth, access to health care, education, and ethnicity (Macintyre et al 2006). This study was aimed at determining the demographic factors associated with the use of ITNs among children and pregnant women in Nigeria.

2.5. Knowledge on ITN use

In a research article published by Foumane, Besnard, Le Mire, Fortes, Dos Santos Carnevale and Manguin (2015) on first knowledge, attitude and practices (KAP) survey of mosquitoes and malaria vector control at household level in Lobito town (Angola), found out that only two hundred and twenty two (52.8%) out of four hundred and twenty (420) respondents with (SD of 45.9–59.7) had knowledge on ITN use as a means of controlling mosquito. Similarly, 85% of households questioned were aware of ITNs/LLINs and 281 answered to be "ready to use". However, 357 net ownership was reported by more than 50% of the households (one mosquito net/family) and were mainly used to protect babies (>50%). Discomfort, hot, and issue to use were the main drawbacks of nets reported from both household "with" and "without net" but more frequently in houses without net.

Another study carried out by Lubwama and Joseph (2013) to assess the community knowledge, perception, and beliefs towards ITN utilization at household level in Busia district, Uganda revealed that there was low knowledge on ITN use (10.9% of 275 respondents) and that community members perceived ITN beneficial for other purposes than malaria prevention as well as diverting the nets for other purposes including trapping white ants and filtering local brew among others. The study further revealed that most community members considered ITN use unsafe (51.4%). The study concluded that there were knowledge gaps, perceived barriers and negative beliefs on ITN use which may be due to inadequate sensitization on ITN use before the massive distribution. It however recommended the need for massive sensitization to address the lapses.

Olayemi, Oreagba and Mabadeje (2004) posited that one of the control measures proposed in fighting malaria is the use of insecticide treated nets including treated bed nets and curtains. A study was done in lieu of this to assess the knowledge, practice and utilization of insecticide treated nets among 190 mothers of children less than 5 years of age using structured questionnaire. The results showed that 61% of the mothers were aware and had actually used mosquito nets before, 28.2% of the mothers were aware of the existence of insecticide treated nets while only 3.2% had tried the insecticide treated nets. It further revealed that 17% had information of the use of the net from doctors, 6.3% had the information from friends while 4.9% had the information from advertisement in the

newspapers. None of the respondents heard formal radio advertisement or health education campaign in the clinic. The reasons given for not using the nets were non availability (62.2%), non affordability (18.7%) and the belief that the treated nets may have negative and adverse effect (18.7%). All mothers were ready to use the nets if adequate information would be provided and the nets be made readily available at affordable cost. The study concluded that the level of awareness and utilization were low among mothers of under 5 and recommended that social mobilization and advocacy strategy in conjunction with existing social marketing should be adopted to achieve considerable results as regards increasing awareness and utilization levels among mothers.

A baseline study on malaria in Uganda in districts of Mukono, Jinja, Mbarara and Arua, found out that 99% of respondents knew about malaria with a high level of knowledge that mosquitoes are the main cause of malaria. 48.3% of the urban respondents observed that the use of nets was the most effective way to prevent malaria. While among rural respondents there was limited knowledge of the best method for prevention.

As part of the findings of the study carried out by HmweKyu, Georgiades, Shannon and Boyle (2013) to evaluate the association between LLIN distribution campaigns and child malaria in Nigeria using data from the Nigeria malaria indicator survey on a nationally representative sample of households, revealed that community level maternal knowledge regarding malaria prevention (OR=0.79,95%CI=0.63-0.99) were negatively associated with child malaria. Hence, the study concluded that improving community level maternal knowledge through appropriate channels might be helpful in preventing child malaria in Nigeria.

2.6. Ownership of ITN and use

ITN ownership does not necessarily guarantee use as investigated in a survey done by Rusell, Salau, Emukah, Graves, Nolan, Ngondi et al.(2015) on the determinants of bed net use in south east Nigeria following mass distribution of LLINs: implications for social behavioural change intervention (SBC). The study found out that the odds of net use increased among individuals who were exposed to tailored SBC in the context of a home visit (OR=17.11;95%CI4.45-65.79) or who received greater degrees of social support from friends

and family (p trend<0.001). Factors associated with decreased odds of net use included: increasing education level (p trend=0.020), increasing malaria knowledge level (p trend=0.022), and reporting any disadvantage of bed nets (OR=0.39;95%CI0.23-0.78). The findings suggested that LLIN use is significantly influenced by social support and exposure to malaria related SBC home visit. The study however concluded that malaria community should further consider the importance of community outreach, interpersonal communication and social support on adoption of net use behaviours when designing future research interventions.

Sena, Deressa and Ali (2013) posited in a community based cross sectional comparative study on predictors of long lasting insecticide treated net ownership and utilization in Ethiopia that out of 2,373 households, 56.6% possessed LLIN/ITN while 43.4% do not have. The study further showed that marital status of household heads, relative wealth index, distance to nearest health service, accessibility to transport; residence and household size had a significant relationship with ITN utilization. The study concluded that well tailored information education and communication is needed to address the problem of non users.

Another study carried out by Polec, Petkovic, Welch, Ueffing, Tanjong Ghogomu, Grabowsky, Attaran, Wells and Tugwell (2015), to assess the evidence of the effectiveness of available strategies that focus on delivery and appropriate use of ITNs through searching reference lists of relevant reviews and studies whose selection criteria include randomized controlled trial, non randomized controlled trial, controlled before-after studies, and interrupted time series evaluating interventions that focused on increasing ITN ownership and use. Out of the 3032 record identified, only ten studies were included which consist of four studies including 4556 households and another study comprising 424 participants on the effect of ITN cost on ownership. These studies suggested that providing free ITNs will probably increase ITN ownership compared to subsidized ITNs or ITNs offered at full market price. Another three studies including 9968 households as well as study comprising 259 individuals on the effect of ITN cost on its appropriate use, found out that there is probably little or no difference in the use of ITNs when they are provided free, compared to providing subsidized ITNs or ITNs offered at full market price. On education, five studies including 12,637 households assessed educational interventions regarding ITN use and concluded that

education may increase the number of adults and children using ITNs (sleeping under ITNs) compared to no education. The last study assessed the effects of providing incentives to promote ITN ownership and use among 519 households and found out that incentives probably lead to little or no difference in ownership or use of ITNs, compared to not receiving an incentive. The study however concluded that ITN ownership was highest among those who received free ITN which means in economic terms, demand for ITNs is elastic with regard to price, and once the ITN is supplied, the price paid for it has little to no effect on its use. It went further to state that educational interventions for promoting ITN have an additional positive effect; however, impact of the different types of education is unknown.

In another research done by Biadgilign, Rida and Kedir (2012) on the determinants of ownership and utilization of insecticide treated nets for malaria control in eastern Ethiopia, it was found that out 335 households surveyed, household ownership for at least on mosquito net and use of net were 62.4% (95% CI 57.2-67.6%) and 21.5% (95% CI 17.1- 25.9%) respectively. It further revealed that households whose heads were engaged in farming (adjusted OR 0.137; 95%CI: 0.04-0.50) and house wife (OR 0.26; 95%CI:0.08-0.82) were less likely to use ITN than those of other occupations. The study concluded that ITN ownership and utilization among the households was low and recommended intensive health education and community mobilization efforts to increase the possession and proper utilization of insecticide treated bed nets.

Bed nets ownership in households in Nigeria is poor and does not translate to usage. This was the position of Osuorah, Ezeudu, Onah, Obinna and Anyabolu in a study carried out on household bed net ownership and use among under-5 children in Nigeria. The study revealed from a nationally representative sample of 5895 households obtained from the 36 states and the federal capital territory in the 2010 Nigeria demographic and health survey, that the rate of household's bed net ownership in Nigeria is about 45.5% and about 48.5% of under 5 children in 39.9% of household surveyed, use a bed net during sleep. A strong correlation between households ownership and child sleeping under a bed net ($r= 0.706$, $p<0.001$) was also revealed. According to the study, acquisition of these bed nets at no cost significantly determined ownership ($p<0.001$) but not usage ($p=0.450$). Likewise, ownership of a bed net was significantly higher in households in rural areas ($p= 0.001$), poorer households

(p=0.001), households with an under-5 child (p=0.001), households whose heads were male (p=0.001), and of lower educational attainment (p=0.001). The study further pointed out that there was a greater likelihood of under 5 children sleeping under a bed net in households with two or more under under-5 children (odds ratio 1.26; CI: 1.05-1.66), two or more bed nets (OR 2.03; CI:1.56-2.66), and in households whose heads were younger [OR 2.79; CI 1.65-4.70] for household heads younger than 29 years and [OR 1.6; CI: 1.17-2.19] for those who were 30-49 years of age), female (OR 1.61; CI:1.00-2.61), and poorer (OR 1.77; CI: 1.03-3.04), and less likely in households with more than three other (aside from the under 5 children) household members (OR 0.23; CI: 0.08-0.69) for household with 4-6 family members and [OR 0.20; CI 0.07-0.61] for households with 7 or more family members. The study recommended that governments and organizations should not just distribute these nets free of charge to households, but also follow up with regular visits and provision of household education to ensure consistent and correct use, especially amongst under-5 children and pregnant women, who are the most vulnerable to infections and complications from malaria.

As quoted by Foumane et al (2015), "it was often noticed that availability could not necessarily imply acceptability and use everywhere even in the same country". This was buttressed by Afolabi, Sofola, Fatumbi, Komakech, Okoh, Saliu, Otsemobor, Oresanya, Amajoh, Fasiku, and Jalingo (2009) in a cross sectional survey on household possession, use and non use of treated or untreated mosquito net in two ecologically diverse regions of Nigeria- Niger Delta and Sahel Savannah. According to the study, out of 439 households with 2,521 persons including 739 under-5, 585 women in reproductive age and 78 pregnant women in Niger Delta region and Sahel Savannah region, 232 had any mosquito nets. Significantly, higher proportion of households in the Niger Delta region had any treated or untreated mosquito nets than those in the Sahel Savannah region. In the Niger Delta region, the proportion of under 5 that had slept under treated nets the night before the survey exceeded those that slept under treated nets in the Sahel savannah region. The study concluded that despite the fact that treated nets were distributed widely across Nigeria, its use was still very low in the Sahel savannah region. It recommended that future campaigns should include more purposeful social and health education on the importance and advantages of the use of treated nets to save lives in the Sahel savannah region of Nigeria.

A community based cross sectional study conducted on ownership and utilization of insecticide treated nets for malaria control in Harari national regional state, eastern Ethiopia by Teklemariam, Awoke, Dessie and Weldegebreal (2015), using structured questionnaires and observational checklist, found out that out of a total of 784 households, about 57.9% of participants had at least on ITN. It further revealed that the utilization of ITNs based on history of sleeping under net in the previous night was 73.3%. As regards proper use of ITNs, the study revealed that 57.9% of respondents demonstrated proper hanging and tucking. However, households with secondary school education (AOR: 1.775(1.047, 3.009)), knowledge about ITNs use (AOR: 1.653(1.156, 2.365)) have more likelihood to own ITNs. The study concluded that ITN ownership was still low and its usage is affected by technological knowhow in terms of hanging and tucking.

As a methodology, a review of data from household surveys, including demographic and health surveys in sub Saharan African countries was carried out by Korenromp, Miller, Cibulskis, Kabir Cham, Alnwick, and Dye (2003) on monitoring mosquito net coverage for malaria control in Africa: possession vs. use by children of under 5 years. The result showed that not all mosquito nets owned by African households are being used and that use was lower than possession because nets were scarce (mean 1.8 per possessing household); nets were not always used for children; use was lower during hot, dry months than during cool rainy months, and many surveys had been conducted in the dry season. The study concluded that household education on the consistent use of nets for this vulnerable group is called for in malaria control programme. Regular district level rapid assessments of household possession of nets should complement ongoing in depth surveys and finally data on 'use during the preceding night' must be interpreted taking the survey season into account.

2.7. Perception on ITN and use

Insecticide treated nets are the mainstay in malaria prevention most especially 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 a community (WHO, 2006)

Bashinyora (2010) cited the study of (Nuwaha 2002) on the perceptions about malaria prevention carried out in Mbarara that avoiding mosquitoes as the most common method mentioned for prevention of malaria. Other preventive strategies mentioned based on the study include boiling of drinking water, improved sanitation, clearing of bushes around the compound, avoiding cold weather, good nutrition, burning mosquito coils, screening of buildings, taking anti-malarias regularly and closing window 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 a bed net was treated or net. Most of the respondents had some doubts about the bed net efficacy in preventing malaria. They 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 some people. The above analysis however pointed out that there are factors within the household which hinder ITN use that needed further investigation. Barriers that would negate their use of ITN according to the study include; being expensive, being difficult to keep from holes, being inconvenient by increasing heat and sweating, causing suffocation and that it is impossible to buy a net for everybody in a big family. Furthermore, some people said that they use bed nets when mosquitoes are plentiful but keep them when there are no mosquitoes in the dry season.

2.8. Factors influencing ITNs proper use

Factors significantly associated with ownership and use of ITN includes education, knowledge of malaria or ITNs, and marital, household income, socio-economic status or ownership of goods, malaria and ITN knowledge, and urban residence. In the larger studies where sample size exceeded 1,000 persons, factors found to be significantly associated with use included: wealth, urban residence, malaria or ITN knowledge, lack of misconceptions, older age (variable comparison groups between studies), and number of ITNs in the household (Deressa, Fentie, Girm and, Reithinger, 2011, Ankomah, Adebayo, Arogundade, Anyanti, Nwokolo, Ladipo and Meremikwu, 2012 and Deribew, Alemseged, Birhanu, Sena, Tegegn, Zeynudin, Dejene, Sudhakar, Abdo and Tessema, 2010). Whether these factors were statistically significantly associated with ITN use varied considerably by study, independent of sample size, and the direction of the association was not consistent between countries.

Paradoxically, in two large household studies conducted in Uganda and Nigeria, a lower education was associated with significantly higher rates of ITN use amongst pregnant women (Ahmed and Zerihun, 2010 and Auta, 2012). This was postulated by Auta *et al.* to be related to an increased perceived vulnerability to malaria in poorer households. The study found that the lowest wealth quintile also demonstrated higher rates of ITN use (OR 2.3, 95% CI 1.1-5). This finding could also be the result of targeted public health campaigns.

Stock-out (or unavailability), cost, and failure to issue vouchers were frequently identified as barriers to ownership (Kweku, Webster, Taylor, Burns and Dedzo, 2007 and Marchant, Schellenberg, Nathan, Armstrong-Schellenberg, Mponda, Jones, Sedekia, Bruce and Hanson, 2010). Cost was identified as a barrier to ownership even in settings where subsidies via voucher schemes were available. Regarding failure to use available ITNs, reported reasons included discomfort, heat or inconvenience, limited perceived benefit of ITNs, and preference to use other malaria prevention methods.

Adaramola and Babalola (2015) found out in a study on factors influencing ITN utilization among under-5 children in Nigeria that there is a significant relationship between respondents ethnicity, educational attainment, wealth index, religion and the utilization of ITN at $p<0.05$. It further revealed that with respect to education, respondents with higher education and in relation to mothers with primary education are more likely to utilize ITN by 57% (OR=1.57, $p<0.05$) while those that belong to the rich wealth index in relation to those who belong to the average wealth index are less likely to utilize ITNs by 21% (OR=0.799, $p<0.05$). The study concluded that utilization of ITNs by under-5 was low regardless of high level of awareness. Factors such as place of residence, marital status and occupation significantly affected ITNs utilization in Nigeria and recommended interventions to address non compliance to proper utilization of nets as well as the need for intensive education emphasizing on their proper and consistent use.

Concern has been raised on gender disparity on the use of ITN most especially base on the recent expansion in ITN distribution strategies range from targeting pregnant women and children under five and distributing ITN at antenatal care and immunization programmes, to providing free distribution campaigns to cover an entire population. This was investigated in

a survey on gender differences in the use of ITNs after a universal free distribution campaign in Kano state, Nigeria by Garley, Ivanovich, Eckert, Negroustoueva and Yazoume Ye. The survey was carried out using a questionnaire adapted from the malaria indicator survey and it showed that household ITN ownership increased more than 10-fold, form 6% before to 71% after the campaign. It further revealed that there was no significant difference between the proportion of females and males living in households with at least one ITN. However, the study found out that a higher percentage of females used ITNs compared to males (57.2% vs 48.8%) and females remained more likely to use ITNs compared to males (OR; 1.5, 95% CI: 1.3-1.7) after controlling for confounders.

According to Sichande, Michelo, Halwindi and Miller (2010), education attainment may be a factor potentially influencing health seeking behaviour of individuals. This hypothesis was tested in a malaria indicator survey that covered the entire Zambia on the effect of the level of educational attainment of household heads of five to nineteen years old individuals in relation with ITN utilization. The study finds out that out of all the respondents, (n=4,810), where 48.5% were males and 51.5% were females, the ITN utilization among the five to nineteen years old individuals from households with the head having primary and secondary education were not statistically significant from those who came from households with the heads had never been to school. For those who came from the households with the heads having tertiary education attainment, they were 1.7 times more likely to have slept under an ITN a night before the survey than those from households headed by individuals who never attended school or had primary education (AOR 1.69;95% CI, 1.19-2.41). The study conclusively suggested that tertiary education of the head of the household might be important in influencing health behaviour of the members of households. Therefore, health education messages focusing on strategies that aim to increase ITN utilization need to account for these differential variations associated with educational attainment in communities. Invariably, the finding that tertiary level of education of the head of the household is associated with high ITN utilization among five to nineteen year olds suggest priority when planning health outreach programmes aimed at sensitizing people on ITN use should be focused more on those with lower education.

2.9. Barriers to net usage

The main barriers to optimal net use cited by these families are listed below. No percentages of respondents are given because the research was qualitative, and sometimes several barriers were mentioned in a single family.

Malaria is not a problem: While 44% of respondents reported that someone had malaria in the past year, those respondents were clustered geographically, with some other areas reporting 13% of malaria cases. In some areas, malaria is epidemic, and recedes as a major problem in the years between epidemics.

Few mosquitoes are around: There is a general belief that nets are needed only after the rains when there are many mosquitoes.

ITN is no longer effective: The effectiveness of ITNs in repelling and/or killing mosquitoes may be perceived as declining over time as fewer mosquitoes come to the net, or when repeated washing or the accumulation of dirt on unwashed nets limits the insecticide's power. People may also feel that their net needs to be retreated.

Rectangular nets don't fit traditional round houses: They may take up too much space or be difficult to repeatedly put up and take down. The 2007 Malaria Indicator Survey found that use of LLINs was 1.6-fold greater in households that owned conical nets compared to those that owned rectangular nets.

Not enough room in the house for more than one net: One net may take up much of the living space in a small home.

Nets are hard to hang: The structure of the house may make it difficult to hang nets, particularly rectangular ones, over all sleeping spaces. The nails used to hang them may easily pull out of mud walls.

Nets are in poor condition: Many nets had holes or tears; some were very dirty. Some nets "saved" for the future … or for future sale: 16% of nets were still in their packages. Some entrepreneurs followed the mass distribution teams to buy up the free nets distributed.

Some nets used for other purposes: Some nets were cut into pieces to cover valuable property (e.g. tv, radio) or used as room dividers, ceiling covers, curtains, and table cloths. These behaviours were not common and tended to occur in specific areas when someone's new idea was copied by others.

2.10. Misuse of ITN

Nearly all experts agree that insecticide-treated mosquito nets (ITNs) are a life saving intervention, supported by strong evidence from carefully conducted trials that show ITNs to be effective in preventing mortality and morbidity associated with malaria (Lengeler, 2004). However, findings by Eisele, Thwing and Keating (2011), revealed that misuse of nets occasionally occur with very little evidence to support the claims. Examples of widespread ITN misuse that have been reported include claims about the use of nets as wedding veils in Uganda and Tanzania (Donnelly, 2006), for fishing in Kenya and Zambia (Butunyi and Oloo 2008), as protection of plants/crops in Sierra Leone (Fofanah, 2010), as chicken coops in the Democratic Republic of Congo (Mubali, 2010), and general misuse in Nigeria (Sanni, 2010). Presently, only one peer-reviewed study reported the misuse of ITNs (Gamble, Ekwaru and terKuil, 2009).This study was a non-probability survey of seven beaches on Lake Victoria in western Kenya, making the conclusions non-generalizable. This was buttressed in a study to investigate the extent of bed net misuse in seven fishing villages which was surveyed along Lake Victoria by Noboru, Gabriel, Gorge, Kyoko and Satoshi (2008). The study revealed that two hundred and eighty three bed nets were being used for drying fishes out of which two hundred and thirty nine were long lasting insecticidal nets (LLIN) and forty four were non long lasting insecticidal nets (NLLIN). It further shown that seventy two of the two hundred and eighty three bed nets were also being used for fishing.

However, data from a 2008 cross-sectional study in the Luangwa District in Zambia, a district bordered by the Luangwa and Zambezi rivers with a population heavily reliant on fishing (Keating, Miller, Bennett, Moonga and Eisele, 2009), and where ITN household possession is greater than 80%, show that only 3% of households reported using their ITNs for purposes other than protection against mosquitoes (Macintyre, Littrell, Keating, Miller and Eisele, unpublished data). This is supported by findings from a qualitative study in Ethiopia that also found misuse of nets to be an uncommon problem (Baume, Reithinger and Woldehanna, 2009). Other forms of misuse identified are that some nets were cut into pieces to cover valuable property (e.g. tv, radio) or used as room dividers, ceiling covers, curtains, and table cloths. These behaviours were not common and tended to occur in specific areas when someone's new idea was copied by others.

As stated earlier, reasons given for misuse most especially by those whose occupation is majorly fishing are that bed nets were inexpensive or free, fish dried faster on the nets which provide greater aeration when laid on grasses and fishes also dried straighter on bed nets which increased the commercial value of the fish. Bed nets were also reported to make up of stronger materials for fishing and are more suitable outdoors (Noboru et al, 2008)

Another reason identified in the 2008 malaria journal, was based on the lack of coordination among agencies such that the villages were supplied more nets than they needed. Hence the excess supplies were diverted for other purposes.
Presently, no intervention is on ground to alleviate this act which is the focus of this research.

2.11. Theoretical framework

Some theoretical logic to net misuse has been posited. Keita Honjo and colleagues concluded from a modeling exercise that, "ITN use for malaria protection can be thwarted in settings of extreme poverty, where an increase in labour productivity by an alternative ITN use can offset the perceived benefits of avoiding malaria infection. Since ITN programmes always depend on the acceptance and active involvement of individuals and communities, human behavioural and social factors will influence ITN use (Stewart and Marchand, 2003).The health belief model, a framework commonly used to explore compliance to health interventions (Champion and Kinner 2008, and Hayden 2009) including community based interventions (Hayden 2009) can be used to interpret perceptions and net use behaviours as shown in previous studies in Tanzania (Koenker, Loll, Rweyemamu and Ali, 2013).The model which draws heavily on Lewin's force field will be used to support this study and has six constructs to explain and predict preventive health behaviours: modifying factors, perceived threats (severity and susceptibility), benefits, barriers, self efficacy and cues to action (Champion et.al., Hayden and Janz et.al.).

Perceived susceptibility: This refers to the subjective assessment of risk of developing a health problem. The health belief model proposes that individual who feels at risk of developing a particular health problem will engage in behaviours to reduce their risk of developing such a health problem. Individuals with low perceived susceptibility may deny they are at risk for contracting an illness and hence engage in unhealthy behaviours. In

relation with ITN misuse, individual may feel not vulnerable to malaria and hence ITN is better use for another purpose better deemed fit.

Perceived severity: This refers to the subjective assessment of the severity of a health problem and its potential consequences. The health belief model proposes that individuals who perceive a given health problem as serious are more likely to engage in behaviours to prevent the health problem from occurring (or reduce its severity). Whereas, individuals that do not perceive a health problem as serious will not buy in to any intervention or engage in behaviours that can reduce or prevent it from occurring. In relation with malaria and insecticide treated net misuse, individual does not regard malaria as a serious illness (but rather calls it ordinary malaria) and if at all he has it will go with time. Hence no need for correct use (i.e. hanging and sleeping under ITN) of ITN.

The combination of perceived severity and perceived susceptibility is referred to as perceived threat. The perceived severity and perceived susceptibility to a given health condition depend on the knowledge about the condition. The health belief model predicts that higher perceived threat leads to higher likelihood of engagement in health promoting behaviours and vice versa.

Perceived benefits: This refers to individual's assessment of the value or efficacy of engaging in a health promoting behavior to decrease risk of disease. Individual may enjoy sleeping under ITN during cold weather only as it can help in keeping the body warm and do not rate its benefit high to the extent of using it religiously. On the other hand, individual may prefer using the net for another purpose during hot weather or when mosquitoes are not rampant. In a similar vein, individuals that believe using ITN for other purposes like to protect garden or farms, cover market goods and fishing net will be more beneficial to them financially and socially than to sleeping under the net will prefer to deploy it as such rather than sleeping under it.

Perceived barriers: Health related behaviours are also a function of perceived barriers to taking action. It refers to an individual's assessment of the obstacles to behaviour change. Even if an individual perceives a health condition as threatening and believes that a particular action will effectively reduce the threat, barriers may prevent engagement in the health promoting behavior. For examples perceived inconveniencies to sleeping under ITN may include itching, stuffy during heat period, limit free movement, psychologically caged or

cannot occupy all the family as well as allergic reactions. In case where there is no free ITN, economic status may also be a barrier. In other words, the perceived benefits must outweigh the perceived barriers for behavior change to occur.

Cue to action: The health belief model posits that a cue, or trigger, is necessary for prompting engagement in health promoting behaviours. Cues to action can be internal or external**.** What other neighbours use ITN for and the role of household head may inform decision on how to use it (external cues) while physiological cues (pain, symptoms heat rash and allergies) are examples of internal cues.

Self efficacy: This refers to an individual's perception of his or her competence to successfully perform a behaviour. The ability to successfully use or misuse ITN will depend on the above factors. An individual whose perceived severity and susceptibility to malaria are low as well as whose perceived barriers to using ITN outweighs its perceived benefits will successfully engage in the misuse of ITN.

CONCEPTUAL FRAMEWORK

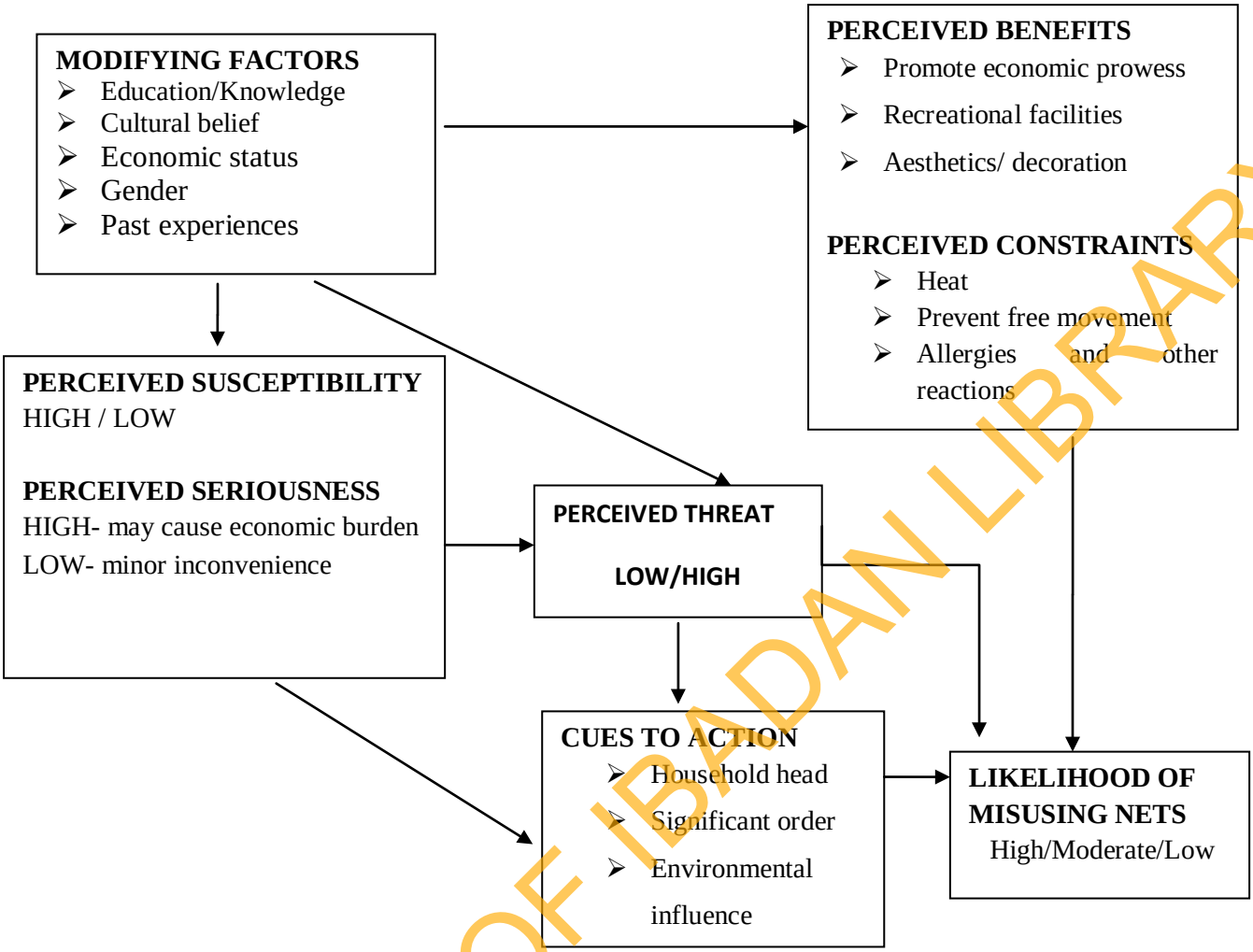

FIGURE 1: MODEL FOR THE STUDY

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Study Design

The descriptive cross sectional design was used for this study using interviewer administered questionnaire that covers all the necessary variables in line with the objectives of the study at Apete community of Ido Local Government.

3.2 Description of the study area

This study was carried out among household heads in Apete community, a locality in Ido local government area of Oyo State. According to 2006 National Population Census, the total population in Apete community is 3,723. It has up to 30 localities which are all inhabited by both literate and non literate with diverse ethnicity.

From the windshield survey conducted by the researcher from the health centres located in the community, it was discovered that the most widely diagnosed and reported ailment is malaria, most especially among vulnerable groups including children and pregnant women. This is in spite of the community wide distribution programme of insecticide treated nets embarked upon by the government in the year 2013 in which majority of the community members benefited as testified by the health workers in the community as well as the community members themselves. Apart from this, free distribution of insecticide treated nets are still ongoing in the health centers to both pregnant women and nursing mothers that presented malaria cases in any of the health centres as witnessed by the researcher during one of the visits to the health centres.

The local government authority through the health workers in the community communicate mostly to the pregnant women during their anti natal clinic as well as nursing mothers during post natal clinic by given health education on the importance of using insecticide treated nets in the prevention of malaria as well as how to use and hang the nets. However during data collection, few of the household heads mostly women, claimed that they were unable to have access to the nets as they have never given birth in any of the health centres. Presently, plans are underway by the Oyo state government to embark on another round of state wide distribution of the insecticide treated net and advertisements are being made in local dialect

on the radio in lieu of this plan. Therefore, their access to ITN prone the need to look into its use and misuse among household head in this local government.

3.3. Study Population

The population of the study included Heads of the selected households in various densely populated and malaria prone areas of the community. As it has been defined, the head of the household been looked into as regards this research is someone who is in-charge of health decisions including the use of ITN.

3.4 Inclusion criteria

Only the household head within the areas/localities in Apete community willing to participate in the study were included in this study.

3.5 Exclusion criteria

The study excluded all household heads that do not reside in the areas earmarked as part of the community and not willing to participate.

3.6 Determination of sample size

The sample size was determined using the formula:

$$N=\frac{z^2p(1-p)}{d^2}$$

where n = minimum sample size required

z= confidence limit of survey at 95% (1.96)

p = proportion of household heads with ITN misuse

d= absolute deviation from true value (degree of accuracy) = 5%

$$n=\frac{1.96^2 \text{ X } 0.50 \text{ X} 0.50}{0.05^2} = 384.16 \text{ approximately } 384$$

$$\text{A non response rate of 10\% of 384} = \frac{384 \text{ X } 10}{100} = 38.4$$

was added to the sample size to make it a total of 422. This was to cover up for the possible case of incomplete response from the respondents.

3.7 Sampling Technique

A multi stage sampling procedure was used.

First stage: This was done through simple random sampling to select part of the localities which included Apete Oja, Yidi/Arola/Akodu, Ayegun/Olomo, Awotan/Orisun and Onikoko. All the localities in the community were written in a sheet of paper after which they were rolled and chosen through balloting.

Second stage: Involved the selection of houses from the parts of the localities that have been selected also through simple random sampling. All the houses in these localities were numbered and then written on a paper for the purpose of balloting. Only the houses that were picked through balloting were included in the survey.

Third stage: Involved selection of household heads from the houses selected. Household heads that have insecticide treated net were automatically selected for the study based on their willingness. In houses where there are household heads without insecticide treated net, household heads were made to ballot to ensure equity and to justify sampling technique systematically.

3.8 Data Collection Instruments

The quantitative method was used for data collection. A semi structured questionnaire was designed that covered the social demographic variables of the respondents and the various specific objectives of the study. The questionnaire was divided into five sections which are;

1 Section A: consist information on socio demographic variables including age, sex, ethnicity, occupation etc.

2 Section B: consist of questions to assess the knowledge level of household heads on insecticide treated net.

3 Section C: This section elicits information on ITN ownership and utilization among the household heads.

4 Section D: Questions on perception on barriers to ITN use were asked

5 Section E: Entails questions on perception on misuse of ITN.

3.9 Validity of data Collection Instrument

The instrument was designed using simple English with its validity being ensured through extensive literature search. The supervisor and other lecturers in the department of health

promotion and education oversaw the development of the instrument before its subsequent administration to ensure face and content validity. The corrections made by these experts were adapted to improve the instrument. There was translation and back translation of the instrument between English and Yoruba (the local language of the target population) languages. Five research assistants were recruited and trained on the purpose of the study and were taken through the details of the various sections and components of the questionnaire. This was done to ensure that they understand the information they are expected to obtain from each respondents.

3.10 Reliability of data Collection Instrument

This defines the extent to which an instrument constantly yields the same results on repeated trials. This was ensured by pre testing 10% of the instrument among household heads in Agbowo community due to its similarity to the field site. The pre test was done to ensure all the questions were relevant to the study and would solicit desired responses from the respondents. It was carried out in May 2016 after obtaining oral consent from the respondents to which the questionnaire was administered. The pre tested questionnaires were coded, entered and analysed using SPSS version20. The findings from the pre-test were used to scrutinize and reset the items in the instrument for necessary adjustment before the main study. Also its internal consistency was determined using the cronbach's alpha coefficient analysis and was found to be 0.72.

3.11 Procedure for Data Collection

Data were collected from May20 – July27, 2016 using interviewer administered questionnaire. The author paid visit to the landlord and residential association meeting of each locality selected in the community prior to the commencement of the study. The questionnaires were administered to the household heads after being duly informed about the study and valid informed consent obtained. A total number of four hundred and twenty (420) questionnaires were administered out of which four hundred (400) were retrieved.

Five research assistants were used for data collection after subjecting them to rigorous training on ethics of collecting data. However, most of the questionnaires were administered during weekends when the household heads can have enough time for the interview process.

3.12 Data management and analysis

The questionnaire were collected, sorted out, cleaned/edited and coded before running the analysis on the SPSS statistical package version20. Socio demographic and economic characteristics were summarized using descriptive statistics such as frequencies and percentages. This was also generated for each of the variables in the questionnaire. Chi square test was also used for the hypothesis testing. A total of seven (7) questions was asked to measure the knowledge level of the respondents and one (1) and zero (0) points was allocated to every correct and incorrect answers respectively making a total of eight (8) points. Participants that scored between 0-3 points were said to have poor knowledge while those with >3 points were said to have good knowledge of ITN. Similarly, nine (9) questions were asked on the respondents' perception on barriers to ITN use to make a total of nine (9) points. Hence respondents that score between 0-4 were said to have wrong perception while those with >4 points were said to have the correct perception on ITN use. On perception on misuse of ITN, eight questions (8) were asked which sum up to a total of eight (8) points. Respondents that score between 0-3 points were said to have wrong perception while those with points >3 were categorised to have the correct perception.

The wealth index (as gotten from the national demographic health survey) of the respondents was calculated as follows;

Each of the household items was scored as; Electricity-1, Radio-2, Television-3, Refrigerator-4, Electric fan- 5, Telephone-6, Gas cooker-7, Electric iron-8, Motorcycle-9 and Car-10. The material for the respondents floor was also coded as; natural floor-1, woodplanks-2, cement-3, carpet/rug-4, tiles-5 and polished floor-6. All these points were then summed up to give seventy six (76) after which respondents that score between 0-25 were said to be of low class, those that score between 26-50 are of the middle class and lastly those that score above 50 are said to be in high class of wealth index.

3.13 Ethical consideration

Ethical approval was obtained from the Oyo State Research Ethical Review Committee, Ministry of Health (M.O.H), secretariat Ibadan. Participation in the research was voluntary by the entire respondents with informed consent obtained. All through the study, the respondents were asked not to provide any information that can disclose their identity to a third party; there anonymous personality was maintained as much as possible. The study

followed ethical principle guiding the handling of human participants in research, which include Respect for person, Beneficence, Non-malificence and Justice. With respect to confidentiality, no identifiers such as name of respondents were used during the course of study. All information provided was kept confidential during and after the research. All information was used for the purpose of the research only**.**

3.14 Limitation of the study

There was no limitation to the study**.**

CHAPTER FOUR

RESULTS

4.1 Socio demographic characteristics of the respondents

Majority of the respondents resided in Yidi/Arola/Akodu (28.3%), followed by those residing in Apete oja (24.5%). A high proportion of the respondents were female (69.0%). The mean ages was 33.38±7.46 years and most were between the 20-29 (39.5%) and 30-39 (38.0%) age group. Majority of the respondents were married (67.0%). About two thirds of the respondents had tertiary education as their highest educational level (66.5%) followed by those that attended secondary school (26.5%). In addition, most respondents were Christians (51.3%) and Muslims (47.3%).

The distribution of the respondents among the ethnic groups showed that 87.8% were Yoruba, 3.8% were Hausa, and 5.5% were Igbo. Also, majority were civil servants while few were unemployed (7.8%). Others are shown in the table. Respondents' wealth quintile as calculated from the respondents' household equipments and floor materials showed that 5.3% of the respondents belong to the low wealth index class, 66.8% the middle class and 28% in the high class. Most of the respondents had a family size of four (22.3%).

Lastly, most of the household heads (53.5%) felt they were at risk of getting malaria.

Table 4.1 Socio Demographic Characteristics of the Respondents N = 400

	Variable	Frequency	Percent%
Age (years)	20-29	158	39.5
	30-39	152	38.0
	40-49	74	18.5
	50-59	10	2.5
	60-69	5	1.3
	70-79	1	0.3
Educational level	Never attended school	13	3.3
	Primary	15	3.8
	Secondary	106	26.5
	Tertiary	266	66.5
Religion	Islam	189	47.3
	Christianity	205	51.3
	Traditional	3	.8
	Others	3	.8
Place of residence	ApeteOja	98	24.5
	Yidi/Arola/Akodu	113	28.3
	Ayegun/Arijo/Oloro/Olomo	68	17.0
	Awotan/Orisun	74	18.5
	Onikoko	47	11.8
Ethnicity	Yoruba	351	87.8
	Hausa	15	3.8
	Igbo	22	5.5
	Others	12	3.0
Job/Occupation	Civil servant	149	37.3
	Trading	121	30.3
	Farming	9	2.3
	House wife only	22	5.5
	Self employed	1	.3
	Student	67	16.8
	Unemployed	31	7.8
Family size	Number of members of the family		
	One	29	7.3
	Two	27	6.8
	Three	49	12.3
	Four	89	22.3
	Five	82	20.5
	Six	65	16.3
	Seven and above	59	14.5
Marital status	Single	113	28.3
	Married	268	67.0
	Divorced	10	2.5
	Widowed	5	1.3
	Separated	4	1.0

4.2 Respondents' Knowledge level on ITN

As shown in Table 4.2, a high proportion of the respondents (77.5%) knew that insecticide treated net is used for malaria prevention and most (62%) have been trained on how to hang the net. About one third (32.8%) of the respondents knew sleeping under ITN is the most cost effective way of preventing malaria. Other responses are shown in the table.

The result further revealed that a larger majority (73.8%) knew how to maintain the net. Though, only 21% of them were able to state the correct way of maintaining ITN which is washing with tablet soap and drying under room temperature. Other responses are shown in the table.

Table 4.2: Respondents' Knowledge Level on Insecticide Treated Net (ITN): N=400

	Variable	Frequency	Percent(%)
Cost effective way of preventing malaria	Visit to hospitals	62	15.5
	Sleeping under ITN	131	32.8
	Using malaria drug	8	2.0
	Using insecticide/mosquito coil	28	7.0
	Sanitation of the environment	158	39.5
	Using herbs/local concoction	13	3.3
Uses of ITN	Prevention of housefly	67	16.8
	Prevention of malaria	310	77.5
	Window curtain	6	1.5
	Night wrapper	4	1.0
	Fishing net	5	1.3
	Cover market goods	1	.3
	Don't know	7	1.8
Benefits of ITN	Mosquito and malaria prevention	305	76.25
Ways to maintaining ITN	Wash with detergent and dry in the sun	151	37.8
	Wash with tablet soap and dry under room temperature	84	21.0
	Keeping it clean always	40	10.0
	Keeping in a cool dry place	55	13.8
	Don't know	70	17.5

4.3 Insecticide Treated Net Ownership and Utilization

4.3.1 Respondents' Ownership of ITN

Majority of the respondents (85.5%) had insecticide treated net in their households of which 43.9% and 37.7% were of the adult and children type. Nearly all the respondents (92.7%) consented to observing their nets. However, only 35.0% of those who consented to observing the nets actually hung nets.

Most of the household with nets had an average of two (2) with the rectangular shaped net (75.2%) being the most common. However, of those that has nets, majority possessed at least one net but not used for Sleeping. Majority of these nets were obtained from the health centre (49.7%) followed by gifts (16.1%). Other sources are shown in the table.

However, of those that have nets, majority are in possession of at least one net not used for sleeping. For respondents without nets, the major reason is unavailability. Others are shown in the table. In conclusion, insecticide treated net ownership among the household heads in the community is on the high side.

Table 4.3.1: Respondents' Ownership of ITN N=342

	Variable	Frequency	Percent%
ITN observation	Yes	317	92.7
	No	25	7.31
	Hanged	111	35.0
	Not hanged	206	64.9
ITN Source	Gift	55	16.1
	Health centre/ANC	170	49.7
	Purchased from shop/pharmacy	38	11.1
	Community wide distribution	45	13.2
	Place of work	15	4.4
	Others	19	5.6
ITN ever had in the household	One	62	18.1
	Two	97	28.4
	Three	70	20.5
	Four	50	14.6
	Five	19	5.6
	Six	17	5.0
	Seven	10	2.9
	Eight	2	0.6
	Nil	15	4.4
ITN have now (Adult)	One	150	43.9
	Two	116	33.9
	Three	33	9.7
	Four	42	12.3
(Children)	Five	129	37.7
	One	78	22.8
	Two	19	5.6
	Three	10	2.9
	Four	2	0.6
	Five	104	30.4
Shape of ITN	Conical	27	7.9
	Rectangular	257	75.2
	Square	58	16.9
Possession of nets not used for sleeping	Yes	248	72.5
	No	94	27.5
Number of net not used for sleeping	One	149	43.6
	Two	75	21.9
	Three	35	10.2
	Four	9	2.6
	Five	3	0.9
	Six	8	2.3
	Seven	10	2.9
	None	53	15.5
Reasons for not having ITN	Nets are unavailable	42	10.5
	Too costly	5	1.3
	No money to buy	11	2.8

4.3.2 Respondents' Utilisation of Insecticide treated Nets

Table 4.3.2 reveals that out of 342 respondents that possessed nets, only 128 (37.4%) slept under the net the night prior to data collection. The distribution of children and adult that slept under these nets is shown in the table.

Based on the frequency of using the nets, respondents that slept under the net "anytime they feel like" had the highest percentage (71.9%). In a similar vein, majority of the respondents had been using the net for a span of two years (29.7%). Up to one third (33.6%) of the respondents that used the nets for sleeping admitted that past malaria experience motivated them to using ITN. Of the various reasons given by the respondents for not sleeping under the net, lack of comfort/ do not like sleeping under it had the highest of percentage (28.0%).

Table 4.3.2 Respondents' Utilization of ITN N=128

	Variable	Frequency	Percent%
Slept under ITN last night	Yes	128	37.4
	No	214	62.6
Children			
	One	45	35.2
	Two	37	28.9
	Three	10	7.8
	Four	7	5.5
	Five	5	3.9
Adult			
	One	45	35.2
	Two	64	50.0
	Three	9	7.03
	Four	5	3.9
	Five	5	3.9
Reasons for not sleeping under ITN last night	Not enough nets for all household members	24	11.2
	Net is old/damaged	33	15.4
	Not comfortable/don't like sleeping under nets	60	28.0
	Slept outside	7	3.3
	No mosquito this season	8	3.7
	Heat	40	18.7
	Preference to use other malaria preventive methods	42	19.6
Frequency of sleeping under ITN	Daily	14	10.9
	Weekly	16	12.5
	Monthly	6	4.7
	Any time I feel like	92	71.9
Length of periods of using ITN	Less than 1 year	30	23.4
	1 year	25	19.5
	2 years	38	29.7
	3 years	15	11.7
	4 years	10	7.8
	5 years	2	1.6
	6 years	1	0.8
	7 years	5	3.9
	More than 7 years	2	1.6
Motivation to using ITN	Friends	30	23.4
	Spouse	16	12.5
	Privacy	12	9.4
	Malaria prevention	43	33.6
	Past malaria experiences	17	13.3
	Others	10	7.8

4.4 Respondents' Perception on Barriers to ITN Use

The response rate of the household heads as regards their perception on barriers to ITN use is shown in Table 4.4. Though a high proportion of the respondents (92.8%) perceived that ITNs can be used to prevent malaria (as shown in the table), however, a very low percentage (3.8%) is of the opinion that ITN is against their religion and cultural belief. Few (17.8%) also admitted that they are allergic to sleeping under ITN.

Table 4.4: Respondents' Perception on Barriers to ITN use **N = 400**

Variable	Yes	No	Don't know
ITN can be used to prevent malaria	371 (92.8%)	24 (6%)	5 (1.2%)
Malaria is not a problem	67 (16.8%)	323 (80.8%)	10 (2.5%)
ITN is not an effective way of preventing malaria	100 (25%)	273 (68.3%)	27 (6.7%)
ITN is unsafe for human use	40 (10%)	332 (83%)	28 (7%)
ITN use is against my religion and cultural belief	15 (3.8%)	376 (94%)	9 (2.2%)
ITN causes nightmare/bad dreams	12 (3%)	372 (93%)	16 (4%)
ITN makes people suffocate	47 (11.8%)	320 (80%)	33 (8.2%)
Consistent use of ITN poses a fear and challenge to me	25 (6.3%)	352 (88%)	23 (5.7%)
I am allergic to sleeping under ITN	71 (17.8%)	278 (69.5%)	51 (12.8%)

4.5 Respondents' Perception on misuse of ITN

From Table 4.5 below, slightly above one third (36.8%) of the respondents perceived that ITN can be used as a window blind and 41% concurred to using ITN for trapping ants and another nuisance. Similarly, 21% of the respondents perceived that ITN can be used in filtering local brews and cereals, while few also opined that it can be used to protect gardens and farm from pest. Other perceptions of the respondents on ITN misuse are shown in the table below.

Table 4.5: Respondents' Perception on misuse of ITN **N =400**

Variable	Yes	No	Don't Know
ITN can be used as window blind	147 (36.8%)	207 (51.8%)	46 (11.4%)
ITN can be used in trapping ants and other nuisance	164 (41%)	187 (46.8%)	49 (12.3%)
ITN can be used in filtering local brews and cereals	38 (9.5%)	316 (79%)	46 (11.5%)
ITN can be used to protect gardens from pest	101(25.3%)	254 (63.5%)	45 (11.2%)
ITN can be used to protect kitchens from rodents	50 (12.5%)	306 (76.5%)	44 (11%)
ITN can be used to make football goals	48 (12%)	325 (81.3%)	27 (6.8%)
ITN can be used to cover market goods	43 (10.8%)	321(80.2%)	36 (9%)
ITN can be used as curtains and table clothes	33 (8.3%)	340 (85%)	27 (6.8%)

4.6. Prevalence of ITN misuse among household heads in the community

Table 4.6 revealed the various misuses of insecticide treated nets among household heads. Out of the two hundred and forty-eight (248) respondents' that possessed nets during the period of study but not used for sleeping, about a third used it as window curtains (32.7%) followed by use as night wrapper (15.3%). Overall, a very high prevalence (75.5%) of insecticide treated net misuse is observed in the community.

Table 4.6: Respondents ways/prevalence of misusing ITN N= 248

	Variable	Frequency	Percent%
Uses of nets not used for sleeping	Window curtain	81	32.7
	Night wrapper	38	15.3
	Fishing net	22	8.9
	Football post	16	6.5
	Protect garden	18	7.3
	Cover market goods	12	4.8

4.7 Factors influencing ITN misuse among household heads in the community

From Table 4.7, the major factor influencing ITN misuse among the household heads in the community is the lack of comfort accompanied by its use. Others preferred to use other malaria preventive methods rather than sleeping under the nets. Worth mentioning is the influence of significant orders like spouses and friends whose ideas/innovations in deploying nets for purposes other than malaria prevention is copied.

Table 4.7: Factors influencing ITN misuse among household heads in the community N=248

Variable	Frequency	Percentage
Net is old/damage	33	15.4
Not comfortable/don't like sleeping under nets	60	28.0
No mosquito this season	8	3.7
Preference to use other malaria preventive method	42	19.6
Not enough nets for all household	24	11.2
Heat	40	18.7
Significant order	41	16.5

4.8: Test of Hypothesis

4.8.1 There is no significant relationship between relative wealth index of household heads and ITN ownership.

The association between the relative wealth index of household heads and insecticide treated net ownership is shown in Table 4.8.1. Out of the 21 household heads that belongs to the lower class, 15 owned ITN while six did not. Of the 267 Household heads in the middle class, 214 had nets while 53 did not. 88 of those in the higher class had nets while 24 did not. The analysis of this relationship showed that, there is no statistically significant association between the relative wealth index of the household heads and their ownership of ITNs. (X^2 = 0.944; P = 0.624). Therefore, the hypothesis is accepted.

Table 4.8.1: Relationship between ITN ownership and relative wealth index variable of the respondents.

	Wealth index			Total	df	X^{2*}	p value
ITN Ownership	**Low(%)**	**Medium(%)**	**High(%)**				
Yes	15	214	88	317	2	0.944	0.624**
No	6	53	24	83			
Total	21	267	112	400			

***Chi square test statistic was used**

****Not significant (p>0.05)**

4.8.2 There is no significant relationship between educational attainment of household heads and ITN misuse

The association between the educational attainment of household heads and insecticide treated net misuse is shown in Table 4.8.2. Only window curtain and night wrapper were used for ITN misuse because they both have the highest frequencies that can be used for the cross tabulation and analysis. 1 and 3 each of the respondents that never attended school and also of primary educational level misused the nets as window curtain and night wrapper. Of those that have secondary school education, 21 misused the nets as window curtain while 13 misused as night wrapper. 56 and 21 respondents with tertiary education misused nets as window curtain and night wrapper respectively. Though, ITN misuse increases among the household heads as their educational level increases, however, this relationship is not statistically significant as the p value is greater than 0.05. Therefore the hypothesis is accepted.

Table 4.8.2: Relationship between household heads educational levels and ITN Misuse

	ITN misuse		Total	Df	X^{2*}	p value
Educational level	**Window curtain (%)**	**Night wrapper (%)**				
Never attended school	1 (0.84%)	1 (0.84%)	2	3	2.592	0.377**
Primary	3(2.52%)	3(2.52%)	6			
Secondary	21(17.7%)	13 (10.92%)	34			
Tertiary	56 (47.1%)	21 (17.7%)	77			
Total	81(68.16%)	38 (31.93%)	119			

***Fisher's Exacttest statistic was used**

****** Not Significant (p>0.05)**

4.8.3 There is no significant relationship between household head's gender and ITN misuse

Table 4.8.3 shows the relationship between household heads gender and insecticide treated net misuse. Among the male household heads, 35 misused the net as window curtain while 17 misused as night wrapper. Of the female household heads, 46 misused as window curtain while 21 misused as night wrapper. In all the various types of misuse, female household heads had the highest frequency of ITN misuse. Hence insecticide treated net misuse is rampant among the female household heads than male household heads. Therefore, there is a statistically significant association between household heads gender and ITN misuse. (X^2 = 0.876; P = 0.025). Hence, the hypothesis is rejected.

Table 4.8.3: Relationship between household heads Gender and ITN Misuse

	ITN misuse		Total	Df	X^{2*}	p value
Gender	**Window curtain**	**Night wrapper (%)**				
Male	35 (67.3%)	17 (32.7%)	52	1	0.876	0.025*
Female	46 (68.7%)	21(31.3%)	67			
Total	81(68.1%)	38(31.9%)	119			

***Chi square test statistic was used**

*** Significant (p<0.05)**

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATION

5.1 Demographic characteristics of the respondents.

Findings from this study showed that most of the respondents were female, married and were mostly between the ages of 20-39.Contrary to expectation in which household heads in the past used to be males, the finding that more of them were females suggest a significant change in household head demographics. However this finding is in line with those reported in the NDHS (2009).

The hypothesis tested to determine whether there is a significant association between the relative wealth index of the household heads and ITN ownership revealed that the association is not statistically significant (X^2 = 0.944; P = 0.624). Invariably, the first hypothesis is accepted since the ownership of an ITN has nothing to do with the class of wealth of the household head. Similarly the second hypothesis shown that as the educational attainment of the household heads increases, their level of ITN misuse also increase. However, despite this association, the relationship cannot be said to be statistically significant as the p value of the association is more than 0.05 as shown in table 4.8.2 above. Invariably, this implies that there might be other factors or confounders responsible for such association. Hence the second hypothesis is also accepted. Lastly, in contrast to the third hypothesis, there is a significant relationship between household head's gender and ITN misuse since female household heads are grossly involved in the various types of misuses compared to their male counterpart. Hence, the null hypothesis is rejected.

5.2 Knowledge of insecticide treated net use among respondents

From the study, the household heads demonstrated a very good knowledge level on what insecticide treated nets is used for. This is in support of the finding from a study conducted by Foumane et al, 2015 on first knowledge, attitude and practices (KAP) survey of mosquitoes and malaria vector control at household level in Lobito town (Angola), where larger percentage of the respondents had knowledge on ITN use as a means of controlling mosquito. In this study, 77.5% of the household heads responded that ITNs are used for prevention of malaria. This is in line with results of other studies that stated that ITN usage is at the centre of malaria control (Lengeler and Snow, 2000; TerKuile et al., 2003).

Other preventive strategies worth mentioning given by the respondents which are also in line with the study conducted by (Nuwaha, 2002) are sanitation of the environment, using malaria drug as well as visit to the hospital.

5.3 Ownership of insecticide treated net among household heads in the community.

Findings from this study revealed that 85.5% (342) of the respondents owned at least one insecticide treated net. This suggests that more than three quarters of the studied household heads had at least one ITN. This might be as a result of the universal coverage methodology adopted by the malaria control programme where distribution of ITNs is not limited to vulnerable groups alone. Secondly it might be due to the fact that members of the community had once benefitted from the community wide distribution of the net. The finding that more of the nets were received from health center/ANC suggests (49.5%) that facility distribution of nets is desirable. Moreover, as stated earlier majority of the respondents in this study were female, hence they will have free access to at least one ITN either during ante natal or post natal visit.

Since these nets are given freely, this as well increases the chances of possessing one or more ITNs by each of the household heads in the community. This is buttressed by Polec et al (2015), in a study conducted on the effect of ITN cost on its ownership. The study suggested that providing free ITNs will probably increase ITN ownership compared to subsidized ITNs or ITNs offered at full market price and this was the case as it concluded that ITNs ownership is highest among those who received free ITNs.

Furthermore, most of the ITNs owned by the household heads are the rectangular shaped adult ITNs as against the 2007 Malaria Indicator Survey which found out that use of LLINs was 1.6-fold greater in households that owned conical nets compared to those that owned rectangular nets. This might be due to ease of hanging and nature of the structures of houses in the community. Most of the respondents also possess at least one net that is use for other purposes.

In a similar vein, the study also finds out that there is no significant relationship between relative wealth index of household heads in the community and ITN ownership in line with the first hypothesis of this study. Hence the hypothesis is accepted implying that ITN

ownership has nothing to do with class of wealth as explained earlier. This is in line with the study conducted by Chidiebere et al (2010), where ownership of a bed net was significantly higher in households in rural areas (p= 0.001) and poorer households (p=0.001).

5.4 Level of ITN usage among household heads in the community.

ITN ownership does not necessarily guarantee use as revealed from the survey conducted by Rusell et al, 2015 on the determinants of bed net use in south east Nigeria following mass distribution of LLINs. This is also the case in this study, where despite the high rate of ITN ownership, utilization is relatively low.

From the result, out of the 342 household heads who owned a net, only 37.4% (128) slept under ITN the night prior to data collection. This implies that only one third of the studied population slept under ITN. This is also obvious from the percentage of those that did not hang (64.9%) the net among the household heads

Similarly, from this study, only 10.9% of the respondents used the net regularly without any interruption while majority used it anytime they feel like (71.9%). This is in line with the findings from the study carried out by Aklilu and Worku, (2016) on insecticide treated net ownership and utilization and factors that influence their use in Gambella region of Ethiopia.

5.5 Perception of household heads on use and misuse of insecticide treated net

Findings from this study revealed that majority of the household heads (87%) have the right perception about malaria as a disease and the efficacy of insecticide treated net in prevention of malaria. Furthermore, as against most of the barriers that have been cited in literature (Bashinyora, 2010), respondents in this study were able to live above the myths and misconceptions that trail the use of ITN such as making people suffocate, causing nightmares, against religion and cultural belief, unsafe for human use and allergy. Despite this, utilization is still relatively low as majority claimed that they are not comfortable sleeping under ITN due to heat.

As regards perception on misuse, majority of the household heads (62.7%) also have the right perception on what ITN should be used and not used for. However, the proportion of those that used the nets for other purposes or have the perception that it can be used for other purposes is still of worry as they may become role models for other community members

since in the real sense, ITNs should not be used for any other purposes other than sleeping under it for malaria prevention.

5.6 Prevalence of ITN misuse among household heads in the community

Findings from the study revealed the various ways by which household heads misuse ITN. This is in line with previous studies (Eisele et al, 2011; Donnelly, 2006; Butunyi and Oloo, 2008; Fofanah, 2010; Mubali, 2010; and Sanni, 2010; though based on anecdotal evidences. However, from this study, major misuse is its use as window curtain (32.7%); other various ways of ITN misuses were also highly significant. This is in line with the observation made and pictures taken during the course of data collection for this study.

Hence, based on the findings from the study ITN misuse is relatively high (75.5%) in the community and not an uncommon occurrence as against what was reported in the previous studies (Macintyre et al, 2009; Baume et al, 2009). Furthermore, the study also finds out that misuse of ITN is prevalent among the female household heads and that there is an association between the educational attainment of the household heads and ITN misuse, though, not statistically significant as explained earlier.

5.7 Factors influencing ITN misuse among household heads in the community

The major factor identified from this study that influenced ITN misuse among the household heads in the community is their lack of comfort to sleeping under the net. Other factors as stated earlier also add to its misuse including the influence of significant orders where the ideas of someone are put to use by others. This is similar with findings of studies conducted by (Kweku et al, 2007 and Marchant et al, 2010) to identify factors influencing the failure to use available ITNs in Ghana. In that study, most of the ITNs deployed for other purposes like to protect gardens and to cover market goods are old /damaged.

5.8 Implication of findings to health promotion and education

The study suggests that insecticide treated net misuse should not be regarded as an uncommon occurrence among community members regardless of the presently found prevalence. This is important because most unhealthy behaviours are usually initiated by few which will then be taken up by the majority without having full knowledge of the lingering and possible implications of such action.

Similarly, insecticide treated net misuse should be nipped in the bud so as to have a laudable achievement in the evangelism embarked upon by the national malaria eradication programme (NMEP) under the ministry of health and to bring to reality in no time the complete eradication of malaria in the nation at large.

Hence as part of enabling community members most especially household heads to have complete control over their health and its determinant (as far as malaria is concerned), the following health promotion and education strategies are suggested;

1. Advocacy to the executive arm of the government as well as policy makers for continuous supply of funds and passing of bills that will promote the correct use of insecticide treated net for malaria prevention.

2. Training and re-training (capacity building) of relevant stakeholders in the health sector most especially health promoters on different strategies to achieving success in the fight against this menace.

3.Community mobilization and house to house sensitization to creating awareness and enlightenment on malaria as a disease in relation with the correct usage of ITN as the most cost effective way to prevent it.

4. Community engagement and participation in any intervention embarked upon by the health promoters for sustainability and efficient outcome.

5. The use of behavioural change and communication approach should not be left out as ITN misuse is a behaviour and always take a very long time to correct. This should be implemented using different information, education and communication materials in different languages for easy comprehension of the messages.

5. 9 Implication of Findings for reducing Net misuse

Since majority of household heads as revealed from the study that misuses insecticide treated nets were female, efforts should be tailored towards health educating them at the various platforms (antenatal and post natal clinics) on the importance of the correct use of the net both health wisely and economically. Ensuring the correct usage of these nets by the vast majority through follow up from health professionals as well as creation of social groups among these care givers will help in the evangelism among the community members as well as go a long way in reducing net misuse in the community.

5.10 Conclusion

This study has provided evidence that insecticide treated net misuse is in the community and was estimated at 75.5% among the household heads in Apete community of Ido local government of Oyo state. This is against previous studies that reported a lower percentage of 3% and that ITN misuse is an uncommon occurrence. The study also equally validates the existence of ITN misuse as against most of the previous studies that were based on anecdotal reports. This was buttressed with the photos taken during the course of data collection as shown in the indexes.

ITN misuse is rampant among the female household heads as revealed in the study, its use as window curtain/net is the most prevalent. Though an association between the educational level of the household heads and ITN misuse exists, such relationship is not statistically significant. Hence, pointing out the existence of other confounders which should be looked into.

5.11 Recommendations

In lieu of the findings from this study, the following recommendations are suggested;

1. Since the association between the educational level of respondents and ITN misuse is not statistically significant, more research should be undertaken to identify other likely confounders that might be responsible for this relationship.
2. Since the existence of ITN misuse has been established considering its high prevalence, non-governmental organisations and national malaria control programme should quickly embark on vigorous campaign programme through sensitization and enlightenment of household heads on the possible implications of ITN misuse.

3. Since ITN misuse is behavioural, it is imperative to incorporate behavioural change communication (BCC) programmes into any technique that might be proposed to be deployed by the concerned agency/parastatals to address this menace. Hence a concerted effort is needed by all health professionals including public health practitioners to nib this act in the bud.
4. As proven from the study that ownership does not necessarily implies utilization, malaria control programmes should elevate from mere distribution of ITNs to ensuring its actual usage through embarking on series of strategic follow up after such wide distribution has been done.
5. If possible, insecticide treated net that will be more users friendly and devoid of heat, rashes and other allergic reactions/inconveniences being experienced by users should be produced in order to encourage its correct usage by community members.

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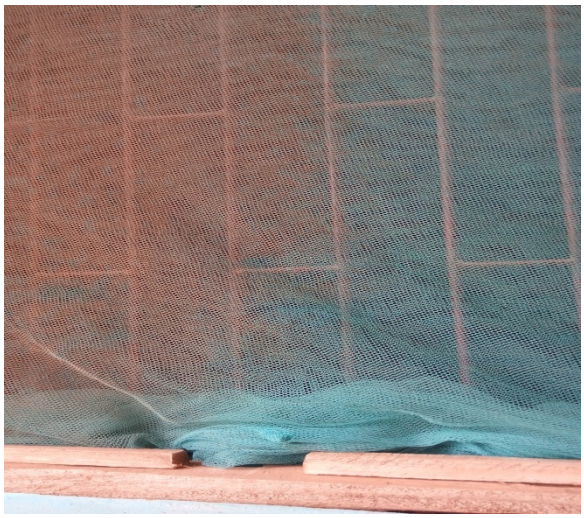
APPENDIX 1A

INSECTICIDE TREATED NET USED AS WINDOW CURTAIN AT ONIKOKO



APPENDIX1B

INSECTICIDE TREATED NET USED TO PROTECT GARDEN AT AYEGUN

APPENDIX 1C

INSECTICIDE TREATED NET USED AS WINDOW CURTAIN AT AKODU

APPENDIX 1D: INSECTICIDE TREATED NET USED TO PROTECT GARDEN AT AKODU

APPENDIX 2

DEPARTMENT OF HEALTH PROMOTION AND EDUCATION

FACULTY OF PUBLIC HEALTH

UNIVERSITY OF IBADAN

RESEARCH QUESTIONNAIRE

INFORMED CONSENT

Dear Sir/Ma,

My name is **Adegbore Abidemi Kafayat**, a Masters student of the above named department is conducting a study on **Misuse of Insecticide Treated Nets among Household Heads in Apete community of Ido Local Government Area of Oyo State.** The data generated from this study could assist the government and NGOs in making critical decisions about ITN which would add immense value to decreasing malaria illnesses, and deaths. I will appreciate your providing answers to the questions which will be asked. This will not take much of your time. Your participation in this survey is voluntary and do not require any of your particulars. I assure you that the data supplied will be used for research purpose alone and will be treated with utmost confidentiality.

Your co-operation is greatly appreciated.

Section A: **Background Information**

1. Age: ----------(last birthday)
2. Gender: i Male ☐ ii Female ☐
3. Educational level: i Never attended school ☐ ii Primary ☐ iii Secondary ☐ iv Tertiary ☐
4. Religion: i Islam ☐ ii Christianity ☐ iii Traditional ☐ iv Others…….
5. Place of residence: i. Apete Oja ( ) ii. Yidi/Arola/Akodu ( ) iii. Ayegun/ Arijo/Oloro Olomo ( ) iv. Awotan/Orisun ( ) v. Onikoko ( )
6. Ethnicity: i Yoruba ☐ ii Hausa ☐ iii Igbo ☐ iv Others …….
7. Job/occupation: i Civil Servant ☐ ii Trading ☐ iii Farming ☐ iv House wife only ☐ vi Student ☐ vii Unemployed ☐
8. Does your household have the following?

a. Electricity? 1. Yes ☐ 2. No ☐

b. Radio? 1. Yes ☐ 2. No ☐

c. Television? 1. Yes ☐ 2. No ☐

d. Refrigerator? 1. Yes ☐ 2. No ☐

e. Electric fan? 1. Yes ☐ 2. No ☐

f. Telephone? 1. Yes ☐ 2. No ☐

g. Gas cooker? 1. Yes ☐ 2. No ☐

h. Electric iron? 1. Yes ☐ 2. No ☐

i. Motorcycle? 1. Yes ☐ 2. No ☐

j. Car? 1. Yes ☐ 2. No ☐

9. The main material for the floor of your home is:

a. Natural floor- Sand/Dung ☐

b. Wood planks/Palm/Bamboo ☐

c. Polished floor ☐

d. Ceramics tiles ☐

e. Cement ☐

f. Carpet/Rug ☐

10. Family size (Please circle): 1 2 3 4 5 6 7 8 9 10 and above

11. Marital status: i. Single ☐ ii Married ☐ iii Divorced ☐ iv Widowed ☐ v. Separated ☐

12. How many sleeping rooms are in the house? (Please circle): 1 2 3 4 5

13. Did you feel your family is at risk of getting malaria? i Yes ☐ ii No ☐ iii. Don't know ☐

Section B: Knowledge Level on Insecticide Treated Net (ITN):

14. What is the most cost effective way to prevent malaria? i. Visit to the hospital ii. Sleeping under ITN iii. Using malaria drugs iv. Using insecticide/mosquito coil v. Sanitation of the environment vi. Using herbs/local concoction.

15. What is ITN use for? i. Prevention of housefly ( ) ii. Prevention of malaria ( ) iii. Window curtain ( ) iv. Night wrapper ( ) v. Fishing net ( ) vi. Football post ( ) vii. Cover market goods ( ) viii. Don't know ( )

16. Have you ever been trained on how to use ITN? i. Yes ☐ ii. No ☐

17. Mention two benefits of ITN i……

ii ……

18. Do you know how to correctly hang a net? i Yes ☐ ii No ☐

19. Do you know how to maintain ITN? i Yes☐ ii No ☐

20. Ways to maintaining ITN are i. Wash with detergent and dry in the sun ii. Wash with tablet soap and dry under room temperature iii keeping it clean always iv. Keep in a cool dry place v. Don't know

Section C: ITN Ownership and Utilization

21. Do you have ITN in your household? i. Yes ☐ ii No ☐

22. Can I observe the net? i Yes ☐ ii No ☐

23. If your answer to question 21 is yes, how/where did you get it? i Gift ☐

ii Health center/ANC ☐ iii Purchased from Shops/Pharmacy☐

iv Community wide distribution ☐ v Place of work☐ vi others……

24. If your answer to question 21 is no, why? i Nets are unavailable☐ ii Too costly ☐

iii No money to buy ☐ iv Others……

25. How many ITN have you ever had in this household? (Please circle): 1 2 3 4 5 6 7 8

26. How many do you have now? Adult (Please circle): 1 2 3 4 5 6 7 8

Children (Please circle): 1 2 3 4 5 6 7 8

27. What is the shape of the ITN that you have? i. Conical ☐ ii. Rectangular ☐

iii. Square ☐

28. Do you have nets that you had but are not used for sleeping? 1. Yes ☐ 2. No ☐

29. If yes, how many are these nets? (Please circle): 1 2 3 4 5 6 7 8 More than 8 years

30. What are they being used for? i. Window curtain ( ) ii Night wrapper ( ) iii. Fishing net ( ) iv. Football post ( ) v. Protect garden ( ) vi. Cover market goods ( ) vii. Nothing ( )

31. Do you sleep under ITN last night? Yes ☐ No ☐

32. If your answer to question 31 is yes, how many members of the household slept under the net last night? No of Children----------. Number of adults----------

33. If no, why did you not sleep under ITN last night? i Not enough nets for all household members ☐ ii Net is old/damaged ☐ iii Not comfortable/ don't like sleeping

☐ ☐ ☐ ☐

under nets iv Slept outside v No mosquito this season vi. Heat vii preference to use other malaria preventive methods

34. How often do you sleep under ITN? i Daily ☐ ii weekly ☐ iii monthly ☐ iv Anytime I feel like ☐
35. For how long have you been sleeping under ITN? i. Less than1year ☐ ii. 1 year ☐ iii. 2 years ☐ iv. 3years ☐ v. 4 years ☐ vi. 5 years ☐ vii. 6 years ☐ viii. 7 years ☐ ix .More than 7 years ☐
36. What motivates you to use ITN? i Friends ☐ ii Spouse ☐ iii Privacy ☐ iv Malaria prevention ☐ v Past malaria experiences vi others ……

Section E: Perception on barriers to ITN use

37. ITN can be used to prevent malaria i Yes ☐ ii No ☐ iii Don't know ☐
38. Malaria is not a problem i Yes ☐ ii No ☐ iii Don't know ☐
39. ITN is not an effective way of preventing malaria i Yes ☐ ii No ☐ iii Don't know ☐
40. ITN is unsafe for human use i Yes ☐ ii No ☐ iii Don't know ☐
41. TN use is against my religion and cultural belief Yes ☐ ii No ☐ iii Don't know ☐
42. ITN causes nightmare/bad dreams Yes ☐ ii No ☐ iii Don't know ☐
43. ITN makes people suffocate Yes ☐ ii No ☐ iii Don't know ☐
44. Consistent use of ITN poses a fear and challenge to me Yes ☐ ii No ☐ iii Don't know ☐
45. I am allergic to sleeping under ITN Yes ☐ ii No ☐ iii Don't know ☐

Section F: Perception on misuse of ITN

46. ITN can be used as window blind i Yes ☐ ii No ☐ iii Don't know ☐
47. ITN can be used in trapping ants and other nuisance i. Yes ☐ ii No ☐ iii Don't know ☐
48. ITN can be used in filtering local brews and cereals i. Yes ☐ ii No ☐ iii Don't know ☐
49. ITN can be used to protect gardens from pest i. Yes ☐ ii No ☐ iii Don't know ☐

50. ITN can be used to protect kitchens from rodents Yes ☐ ii No ☐

iii Don't know ☐

51. ITN can be used to make football goals Yes ☐ ii No ☐

iii Don't know ☐

52. ITN can be used to cover market goods Yes ☐ ii No ☐

iii Don't know ☐

53. ITN can be used as curtains and table clothes Yes ☐ ii No ☐

iii Don't know ☐

Thank you Sir/Ma for your participation

IYONDA LATI FI ERO OKAN YIN HAN

SA/MA

Oruko mi ni Adegbore Abidemi Kafayat, ti mo je akekoo (onipele keji) ni eka imo ti a daruko loke tele ti o n se iwadi lori asilo apo efon laarin awon olori ile ni agbegbe Apete eyi ti n beni ijoba ibile Ido ni ilu Oyo. Awon akojopo idahun ti a ba mujade ninu iwadii yi yoo se iranlowo fun ijoba ati awon ile ise aladani lati le gbe igbese ti o muno doko lori apo efon ti o tun ma lekun mimu adikun ba aisan iba ati iku.

Inu mi yoo dun ti e ba le wa idahun si awon ibeere ti n o maa biyin. Eleyii ko ni gbayin ni asiko pupo. Ikopa yin ninu iwadi yii kii se dandan beeni kope fun idanimo yin pelu. Mo wa fin n dayin loju pe awon idahun ti e ba pese yoo wulo fun iwadi yii nikan, a o si se agbeyewo re laise afihan re fun enikenikeni.

A dupe pupo fun ifowosowopo yin.

IPIN A: IWADII IPILE

1. Ojo Ori …….. (ojo ibi ti asekeyin)
2. Eya: i Ako ☐ ii Abo ☐
3. Ipele Eko: i N ko kawe rara ☐ ii Alakobere ☐ iii Girama ☐ iv Ile eko giga ☐
4. Esin: i Isilaamu ☐ ii Kiristeni ☐ iii Abalaye ☐ iv Esin miiran to yato si awon wonyii ☐
5. Ibugbe: i Apete oja ( ) ii Yidi/Arola/Akodu ( ) iii Ayegun/ Arijo/Oloro/Olomo ( ) iv Awotan/Orisun ( ) v Onikoko ( )
6. Eya: i Yoruba ☐ ii Hausa ☐ iii Igbo ☐ iv Omiiran ☐
7. Ise-n-se: i Osise ijoba ☐ ii Oloja ☐ iii Agbe ☐ iv Iyawo ile nikan ☐ v Osise adani ☐
   vi Akekoo ☐ vii N ko tii rise ☐
8. Nje ile re ni awon nnkan wonyii? ☐

   a Ina monamona i Beeni ☐ ii Beeko ☐

   b Redio/asoromagbesi i Beeni ☐ ii Beeko ☐

   d Amohun- maworan/telifisan i Beeni ☐ ii Beeko ☐

   e Amohun tutu i Beeni ☐ ii Beeko ☐

   e Ero afetegun/faanu i Beeni ☐ ii Beeko ☐

   f Ero ibanisoro i Beeni ☐ ii Beeko ☐

   g Ero idana i Beeni ☐ ii Beeko ☐

   gb Ero iloso/ayonu i Beeni ☐ ii Beeko ☐

   h Alupupu i Beeni ☐ ii Beeko ☐

i Ayokele i Beeni ☐ ii Beeko ☐

9. Pataki ohun elo ti a fi se ile re ni:

a Iyepe lasan ☐

b Pako/Imo ope/ Oparun ☐

d Ile didan ☐

e Awo alalemole ☐

e Simenti ☐

f Eni ateeka ☐

10. Eto ebi: (Fala si eyi ti o ba je tire) 1 2 3 4 5 6 7 8 9 jubeelo

11. Eto igbeyawo: i Wundia/giripa ☐ ii Eni to ti feyawo/loko ☐ iii Eni to ti koyawo/koko ☐
iv Opo ☐ v Iya n dagbe/ baba n dagbe ☐

12. Iyara ibusun meloo lo wa ninu ile re? 1 2 3 4 5

13. N je o rope awon ebi re wa ninu ewu lati ni aisan iba? i Beeni ☐ ii Beeko ☐ iii N ko mo ☐

IPIN B: IPELE IMO NIPA APO EFON

14. Ona wo ni ko ganilara lati deena aisan iba? a Sise abewo si ile iwosan ☐ b. Sisun ni abe apo efon ☐ d Lilo ogun iba e Lilo ogun efon ☐ e Titun ayikase ☐ f Lilo agbo iba ☐

15. Kin ni a n lo apo efon fun? A Didena esinsin ☐ b Didena aisan iba ☐ d Lilo si oju ferese ☐
e Gege bi aso ibora ☐ e Awon ipeja ☐ f Awon imuboolu ☐ g Lati fi bo oja ☐
gb N ko mo ☐

16. N je enikeni ti da o lekoo lori lilo apo efon? a Beeni ☐ b Beeko ☐

17. Daruko meji ninu iwulo apo efon? i …….. ii ……..

18. N je o tile mobi a se n gbe apo efon ko daadaa? a Beeni ☐ b Beeko ☐

19. N je o mo bi a se n samojuto apo efon? a Beeni ☐ b Beeko ☐

20. Awon ona ti a n gba se amojuto apo efon ni ……. a Fifo pelu ose oniyefun ati sisa sabe orun ☐
b Fifo pelu ose olowo ati sisa sabe iboji ☐ d Ki o maa wa nimototo ni gbogbo igba ☐
e Ki o maa wani abe orule ☐ e N ko mo ☐

IPIN D: APO EFON NINI ATI LILO RE

21. N je o ni apo efon ninu ile re? a Beeni ☐ b Beeko ☐

22. N je mo le ye apo naa wo? a Beeni ☐ b Beeko ☐

23. Bi idahun si ibeere (21) ba je beeni, bawo/nibo lo ti rii? a Ebun ☐ b Odo awon eleto ilera/itoju oyun ☐ d Rira ni ile itaja/ile ita oogun ☐ e Won pin-in ni adugbo ☐ e Nibi ise ☐ f Nibo miiran ☐

24. Bi idahunsi ibeere (21) ba je beeko, kin ni idi? a Apo naa ko kari ☐ b O won ju ☐ d Ko si owo lati raa ☐ e Awon idi miiran ☐

25. Apo efon meloo ni o ti ni ri ninu ile yii? 1 2 3 4 5 6 7 8

26. Meloo ni o ni lowo bayii? Agba 1 2 3 4 5 6 7 8 Omode 1 2 3 4 5 6 7 8

27. Kin ni irisi apo efon re? a Rogodo ☐ b Onigun bi ile isana ☐ d Onigun merin ☐

28. Nje o ni apo efon ti o ni ti o kii lo fun sisun? a Beeni ☐ b Beeko ☐

29. Bi o ba je beeni, meloo ni awon apo efon yii? 1 2 3 4 5 6 7 8 ju beelo

30. Kin ni won wa wulo fun un? a Fun ferese ☐ b Aso ibora ☐ d Awon ipeja ☐ e Awon imu boolu ☐ e Idabobo ogba ☐ f Bibo oja ☐ g Ko si ☐

31. N je o sun ni abe apo efon ni ale ana? a Beeni ☐ b Beeko ☐

32. Bi idahun si ibeere (31) ba je beeni, eni meloo ninu awon ebi re lo sun sabe apo efon lale ana? a Onka awon omo …….. b Iye agbalagba …….

33. Bi idahun re ba je beeko, kin ni idi ti e ko fi sun labe apo efon lale ana? i Ko si apo efon ti o le gba gbogbo ebi ☐ ii Apo efon naa ti gbo/ya ☐ iii Ko rorun/ N ko nifee si sisun labe apo efon ☐ iv Ko si efon lasiko yii ☐ v Ita ni mo sun ☐ vi Ooru ☐ vii Nini ifesi ona miiran ti o n deena iba ☐

34. Bawo ni sisun re labe apo efon? a Ojoojumo ☐ b Osoose ☐ d Osoosu ☐ e Igba ti o ba wumi ☐

35. O ti to igba wo ti o ti n sun labe apo efon? a |O din lodun kan ☐ b Odun kan ☐ d Odun meji ☐ e Odun meta ☐ e Odun merin ☐ f Odun marun-un ☐ g Odun mefa ☐ gbOdunmeje ☐ h O le lodun meje ☐

36. Kin ni o wu o lori lati maa lo apo efon? a Ore ☐ b Ololufe ☐ d Lati dawa ☐ e Fun idena aisan iba ☐ e Iriri nipa aisan iba ☐ f Idi miiran ☐

IPIN E: IRIRI LORI AWON OHUN TI O LE JE IDENA FUN APO EFON

37. Apo efon le dena aisan iba a Beeni ☐ b Beeko ☐ d N ko mo ☐

38. Aisan iba kii se isoro a Beeni ☐ b Beeko ☐ d N ko mo ☐

39. Apo efon kii se ona kan gboogi lati dena aisan iba a Beeni ☐ b Beeko ☐
d N ko mo ☐
40. Apo efon lilo maa n ko ipalara ba eniyan a Been☐ b Beeko☐ d N ko mo ☐
41. Lilo apo efon tako igbagbo esin ati asa mi a Beeni☐ b Beeko ☐ d N ko mo ☐
42. Apo efon tile maa n fa alakala a Beeni ☐ b Beeko ☐ d N ko mo ☐
43. Apo efon maa n fa gbigbemi mi a Beeni ☐ b Beeko☐ d N ko mo☐
44. Mima lo apo efon ni gbogbo igba maa n fa iberu ati awon idiwo miiran fun mi a Beeni ☐
b.Beeko ☐ d N ko mo ☐
45. Mo ni ikorira fun sisun labe apo efon a Beeni ☐ b Beeko ☐ d N ko mo ☐

IPIN F: IRORI NIPA ILOKULO APO EFON

46. A le lo apo efon gege bi awon oju ferese a Beeni☐ b Beeko☐ d N ko mo ☐
47. Apo efon wa fun pipi kokoro ati awon nnkan miiran a Beeni ☐ b Beeko ☐
d N ko mo☐
48. Apo efon tun le wulo fun sise oti ibile tabi ogi a Beeni ☐ b Beeko ☐ d N ko mo ☐
49. Apo efon le wulo fun idabobo oko etile lowo kokoro a Beeni ☐ b Beeko☐
d N ko mo ☐
50. Apo efon tun le wulo fun idabobo ile idana kuro lowo eku a Beeni ☐b Beeko ☐
d N ko mo ☐
51. Apo efon le wulo fun awon imu boolu a Beeni ☐ b Beeko ☐ d N ko mo ☐
52. A le lo apo efon fun bibo awon nnkan ti a n ta a Beeni ☐ b Beeko ☐ d N ko mo ☐
53. Apo efon le wulo gege bi aso oju ona ilekun ati ori tabili a Beeni☐ b Beeko ☐
d N ko mo☐
E seun Sa/Ma fun ifowosowopo ati ikopa yin.