
ACCESSIBILITY AND UTILIZATION OF MOSQUITO NET BWAISE KAWEMPE DIVISION KAMPALA DISTRICT

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ABSTRACT

Insecticide- treated nets are the most powerful malaria control tool if used correctly. Yet up to date, utilization is still unacceptably low: only 3 percent of African children are currently sleeping under an ITN, and about 20 percent are sleeping under any kind of net. Worse still, malaria continues to be the leading cause of child mortality and morbidity. The aim of this study was to investigate the intra-household factors that affect the utilization of ITNs in households with children under five. The study specifically sought to identify the intra-household practices that affect the use of ITNs among the under-five; examined the knowledge, attitudes, perceptions and beliefs of caregivers towards the usage of ITNs; and lastly analysed the affordability of ITNs by households with children under five years. This study was conducted in villages from Kawempe which were randomly selected and used a cross sectional design. The study findings show that first; there were intra-household factors that affected utilization of ITNs in households with children under five. These factors that affected utilization include; type of household structure, number of people sleeping in the household, intra-household gender relations, sleeping arrangements, disruption of sleeping patterns due to visitors and cultural rituals and functions. These factors affect consistency in utilization of ITNs and proper deployment. Secondly, knowledge on ITNs was found to be low though general knowledge about mosquito nets was found to be high. Utilization was also affected by poor perceptions, beliefs and attitudes that discourage caregivers from using the ITNs. Access to ITNs was very inadequate and unavailable within the study community. The majority of the people being peasants, there were insufficient incomes and therefore ITNs were not a priority given the level of poverty. This study concluded that financial inadequacies at the household level, poor perceptions of caregivers and intra-household dynamics impact negatively on effective utilization of ITNs among the under-fives. I would therefore recommend that; public-private partnership be adapted to ensure availability of ITNs and insecticides in local shops and other outlets including arrangements at village level to re-treat the nets, the economic level of caregivers should be boosted to counteract the financial inadequacies, adoption of a behaviour change strategy to transform caregivers' perceptions, beliefs and attitudes; and massive education of the community.

Key words: accessibility, utilization and mosquito net

Background to the Study

A 2011 World Health Organization (WHO) report on malaria demonstrates the enormous burden of malaria, with 216 million cases and 655,000 deaths attributable to this mosquito-borne parasite in 2010 alone (Richard, 2022). Africa largely bears the

burden, with 91% of deaths occurring, with pregnant women and children under five most at risk of infection and adverse outcomes (Jac & Kazaara, 2023). Each year in sub-Saharan Africa, an estimated 25 million pregnancies are at risk of malaria, the consequences of which can be severe for both mother

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and fetus in terms of morbidity and mortality (Jac & Kazaara, 2023). Consequences of malaria in pregnancy include maternal anaemia, stillbirth, low birth weight and intrauterine growth restriction

Malaria is a major cause of morbidity and mortality worldwide, particularly among pregnant women and young children, and especially in tropical Africa, where at least 90 percent of malaria deaths occur (John et al., 2023). More than three-quarters of global malaria deaths occur in children under 5 living in endemic countries in sub-Saharan Africa (WHO 2003), where 25 percent of all under-five mortality (about 800,000 young children are attributable to malaria) (WHO, 2003). In Uganda, malaria accounts for 25-40 percent of all outpatient visits to health facilities. Up to 20 percent of all hospitalizations and 15 percent of deaths among hospitalized patients are caused by malaria (MOH 2006). About 30–40 percent of all fevers seen in health centers in Africa are due to malaria, with huge seasonal variability between the rainy and dry seasons (Cand et al., 2022). It is less than 10 percent at the end of the rainy season and more than 80 percent when the rainy season ends.

Despite widespread policy implementation and significant financial investment in ITN distribution, coverage remains suboptimal in many regions, particularly with regard to pregnant women

Statement of the problem.

Insecticide-treated nets are the most effective malaria control tool to be developed and as such have been an important part of global and national malaria control policies since the mid-1990s. Yet uptake is still unacceptably low: only 3 percent of African children currently sleep under an ITN and about 20 percent sleep under any net (Oresanya et al 2008). Worse still, malaria continues to be a leading cause of child mortality and morbidity despite government, NGO and private sector interventions to ensure that children under five, who are the most vulnerable, own and sleep under ITNs. The use of ITNs by children under five requires households to own a network (Oromo et

(Musaibah et al., 2023). Recently published data from sub-Saharan Africa found that although 96% of countries surveyed had ITN coverage policies, reported ITN coverage of pregnant women was only 17%. The main delivery system for ITNs has been antenatal clinics (ANCs) (Kazaara et al., 2023), using free distribution or a voucher system. Interestingly, ANC participation was not found to be a major factor limiting coverage. WHO has identified supply as a primary barrier to achieving optimal coverage, with the latest World Malaria Report indicating a high correlation between ITN ownership and use (range 93-99%) in the general population (Ninsiima et al., 2023) [WHO, 2011]. This is despite the wide variation in this relationship at the national level in the African region, as shown by Eisele et al. in its summary of Demographic and Health Surveys (DHS) and Malaria Indicator Surveys (MIS) from 15 countries [WHO, 2008]. As malaria in Uganda continues to be the leading cause of child mortality and morbidity in Uganda, and yet ITNs have been made available to the population, a decrease in child mortality from malaria is expected, which has not yet been realized. Against this background, this study investigates the assessment of mosquito net availability and use in Uganda using a case study of Kawempe Division Kampala District.

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al., 2023). While programs to ensure children's access to ITNs have been vigorous, rates of use do not appear to mirror rates of ownership. Expanded ownership of ITNs can only significantly reduce malaria mortality if nets are used correctly by under-fives. But to what extent are owned networks actually being used? If a household owns a net, which household members are most and least likely to sleep under it? How many family members sleep under the net and what are the most common groupings under the net? What happens to these patterns when a family gets more than 1 net? There seemed to be unanswered questions that this study sought to provide. Few studies on ITNs in children under five years of age have focused on the effectiveness of ITNs in malaria control, availability, availability and ownership of ITNs: no study has been conducted to assess the perception and effects of mosquito net delivery that influence ITN use. in households with children under the age of five that this study sought to explore.

Specific Objectives

- To identify the Intra-household practices that affect the use of ITNs among the under-fives.
- To examine the knowledge, attitudes, perceptions and beliefs of caregivers towards the usage of ITNs.
- To determine the affordability of ITNs by households with children under five years.

Methodology

The research design was cross-sectional, where women and men were studied to have views that were representative of all sexes. Cross-sectional design being a short time achieving type of study, was involve studying different people at the same time to get a quick picture of the assessing the perception and the effects of Mosquitoes Net a delivery at that particular time. Both quantitative and qualitative methods will be used. The quantitative methods were used establish the social, economic and psychological factors within the household affecting utilization of ITNs. It was used to show association between the social demographic characteristics of respondents and utilization of ITNs within the household. Qualitative methods were used to investigate perceptions, attitudes, beliefs and knowledge on ITNs delivery and establish intra-household factors responsible for low usage of ITNs. The key informant interviews were used to obtain views and experiences of service providers and community leaders. The study was conducted in Kawempe Division Kampala District. Is one of the five division that comprises the city of Kampala alongside with Makindye Division, Lubaga Division, Nakawa Division and Central Division. Kawempe Division was selected to represent Isingiro district because it is one of the sub-counties where free net distribution to under-fives was done by Ministry of Health in 2008. It was therefore, assumed that children under five years own nets. The target of the interview was caregivers in the households. Systematic random sampling was used to select 11 men and 11 women caregivers from each of the selected zones. From the sampling frame, a starting household with children under five years were chosen at random, and thereafter at regular intervals, other households with similar characteristics were selected. The total number of respondents in the sample survey will be 50 to 88 respondents. The respondents were selected randomly because random selection is done without personal bias of the researcher, sample repetitiveness can be estimated and statistical tests used to analyse the data assume random selection. Caregivers including both men and women were done to avoid gender bias and also because it is the responsibility of these caregivers to look

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after children under five. The following categories of key informants were selected purposively; 4 traditional birth attendants, 4 secretaries for health, 4 community resource persons, 1 chairperson LCIII, 1 Chairperson LCII, 4 Chairpersons LCI, 4 Secretaries for women, 1 in charge Health Centre III, 1 Mid wife, 4 Opinion leaders, 1 District Malaria focal per son and 1 District Director of Health Services. The total qualitative samples were equal to 35 key informants. These key informants include in the study because they were considered to be more knowledgeable about ITNs as a strategy to malaria prevention among children under 5 years and know more about the lives of children under five years in different households. The study used two categories of research instruments; self-constructed and self- administered questionnaire and an interview guide. Both open and close-ended questions were designed for each category of respondents. These questionnaires were self- constructed and self- administered to caregivers, traditional birth attendants, secretaries for health, community resource, chairperson and mid wife to assess the Accessibility and Utilization of Mosquito Net in Kawempe Division Kampala District. The questionnaire was designed in the way of both open and closed in nature. The questionnaire instrument was preferred because it was time saving. Responses from traditional birth attendants, secretaries for health, community resource persons, chairperson LCIII, Chairperson LCII, Chairpersons LCI, Secretaries for women, in charge Health Centre III, Mid wife, Opinion leaders, District Malaria focal per son and District Director of Health Services were obtained by use of both closed and open-ended questionnaires. The questionnaire was used because it standardizes responses and is a time saver. It makes it easy to present the information by way of categorizing, tallying, and general presentation. The questionnaire sought personal judgment the assess the Accessibility and Utilization of Mosquito Net in Kawempe Division Kampala District. Data analysis was done after collecting the raw data from the field, editing and checking for accuracy of information, consistency and uniformity. The collected data were analyzed both quantitatively and qualitatively. Quantitative data were grouped and statistical description such as tables showing frequencies and percentages and pie- charts were developed for better representation of the study findings. The data was then coded and checked for any errors and omissions. Data was analyzed using descriptive statistics such as percentages and arithmetic mean scores. Frequency tables were drawn using Statistical Package for Social Sciences (SPSS) software (Nelson et al., 2022). The data from the interview were analyzed in themes.

RESULTS

Intra-household dynamics and utilization of nets

In the household, there are factors that determine net ownership and usage by members sleeping within the household. These factors affect effective utilization of ITNs by household members including children under five. Even when the ITN is available in the household, the children under five may not be able to use it properly and consistently due to intra- household dynamics. This section presents findings and discussion on the intra-household factors that impact on utilization of ITNs within the household. It looks at the type of household structure, number of people sleeping in the household, sleeping arrangements in place, and disruption of sleeping patterns due to visitors and cultural rituals and functions. It also seeks to understand whether members in the households have mosquito nets and who specifically uses the nets

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Household structure

The most common household structures are small huts thatched with grass that do have only one room, grass thatched/made of mad and wattle, semi-permanent structures roofed with iron sheets and permanent structures. The different kinds of household structures may favour or deter the use of mosquito nets especially hanging nets. Respondents were asked about the kind of household structure they stay in. The findings in the table below show the kind of household structures in the study population cross tabulated with occupation of participants to find out whether there is a relationship between household structure and occupation and thus affecting proper utilization of ITNs in the household.

Table 1: Across tabulation of household structure and occupation

Occupation	Household structure			Total
	Grass thatched	Semi-permanent	Permanent	
Farmer	14(22.6%)	41(66.1%)	7(11.3%)	62(100%)
Salaried	1(11.1%)	4(44.4%)	4(44.4%)	9(100%)
Casual worker	2(33.3%)	3(50.0%)	1(16.7%)	6(100%)
Trader	0	4(66.7%)	2(33.3%)	6(100%)
Unemployed	1(25%)	3(75%)	0	4(100%)
Student	0	1(100%)	0	1(100%)
Total	18(20%)	56(63.6%)	14(15.9)	88(100%)

Source: Primary Data 2022

As shown in the table 1, the majority of the respondents stayed in semi -permanent structures roofed with iron sheets accounting for 63.6 percent. While 20.5 percent stayed in grass thatched houses made of mad and wattle and few 15.9 percent were in permanent structures. None of the respondents was staying in the small huts that make it difficult to hang the net. This would mean that in this study population, the household structures can support hanging of mosquito nets. However, as shall be seen in the coming sections, some caregivers were found not to be using nets simply because the houses they stayed in were too small to allow hanging of mosquito nets. They had kept the nets waiting to use them when they construct a bigger house.

structure and came up with the results indicated in the same table above. In terms of ownership of permanent structures, farmers had the lowest percentage (11.3 percent) of the total number of respondents whose occupation was farming. Unemployed and students were found not to be living in permanent structures (Nelson & Christopher, 2022). The reason for such trend is that the unemployed and students do not have any source of income to enable them put up permanent structures. Also, since most of the farmers were engaged in peasant farming/subsistence farming, they cannot raise enough money to construct permanent structures. It is salaried workers whose majority were in permanent structures 4 (44.29percent).

The researcher further analysed the relationship between occupation and the type of household

Respondents were asked about the number of rooms each house has and 31.8 percent of the respondents

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had houses with 2 rooms, 30.7 per cent with 3 rooms, 22.7 percent with 4 rooms and only 2.3 percent had their houses with six rooms. The number of rooms ranged from 1 room to 6 rooms. The number of rooms and people staying in each household determine the number of people sleeping in one net or not even sleeping under the net. If the household has one room, it is difficult for household members to sleep under the net due to lack of space as some

household members sleep on the floor as shall be seen in the coming sections of this study. As talked about earlier some key informants revealed that they were not using the net which was given to them because of lack of enough space in the house. They hoped to use the net when they build a bigger house. They complained that, when the house is too small, it does not permit use of a net.

Number of people sleeping in a household

Under this section, respondents were asked about the number of people in the household, number of children under five years staying in the household and their relationship with the respondents. The number of people sleeping in one household ranged from 2 people to 11 people. The majority of the households had 2 to 5 people sleeping in one household accounting for 51 percent and only 3.5 percent of the study participants slept 10 or more people in each household. But still, on average in this community (Ntirandekura & Christopher, 2022), a big number of people sleep in the same household.

The 45.5 percent of the study participants sleeping 6-9 people in the same household should not be ignored. This implies that congestion is at its peak and this affects proper use due to heat and ability to provide ITNs to all household members. That's why as shall be seen later in this study, some of the caregivers complained of a lot of heat as one of the hindrances to ITN use. These findings are different from the study that was done in western Kenya where number of household occupants had no effect on ITN use (Alaii et al; 2003).

In terms of the children under five years, 43.2 percent of the interviewed respondents had one child in the household, 34.1 percent 2 children, 30.5 percent 3 children and 2.3 percent 4 children in the household who are below the age of five. The number of children under five also overstretches the capacity of the household in as far as provision of ITNs is concerned. And given the low level of household income, the households find themselves incapacitated to afford ITNs for all their children under five. It was also found out that, 94.3 percent of the respondents had children in their households who are below five years as their own biological children, 3.4 percent were siblings and 1.1 percent, niece/nephew and grand-children respectively.

Number of beds in the household

It was found out that the majority of the respondents interviewed did not have enough beds for all household members. This has implications to net use especially among the children under five years who are not given priority when it comes to sharing of beds. Seniority in African tradition plays an important role in households when it comes

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to sharing of resources. The elders are given first priority especially in regard to limited resources. The majority of the respondents had less than three beds per household in the study community. The majority 59.1 percent of the study participants had between 1 -2 beds and only 6.9 percent had five and above beds within the household. In instances where the household had one bed, it was for the parents sometimes sharing it with the child who is still on breastfeeding. This implies that the rest of the children sleep on the floor which does not permit mosquito net hanging putting in mind the fact that the houses themselves are too small.

These findings are further confirmed with the findings from key informants that reveal the same. The community development officer in this community mentioned that some children in the village do not have beds, so there is no way a mosquito net can be fitted on the floor. Therefore, after receiving the net, the conditions within the household do not favour net hanging due to insufficient beds. These findings are also in agreement with the study done in Iganga District on factors influencing access to and compliance with ant malarial measures in children under five where many children in the community slept on the floor, and could not use the ITNs even if they were given to them (Kagaha2008). Seniority in the household further precipitates this inability of under-fives to properly and consistently use ITNs that initially are meant for them.

Sleeping arrangements in the household

Table 2: Sleeping groups in the household

Group	Frequency	Percentage
Children under 5 sleeps alone	45	27.1
Children under 5 sleeps with parent	37	22.3
Parent sleep alone	47	28.3
Children under 5 with sibling	37	22.3
Total	166	100

Source: Primary Data 2022

As presented in the table above, more than one response was possible and 28.3 percent of the respondents said that parents sleep alone, 22.3 percent sleep with parents and older siblings and 27.1 percent of the respondents agreed that children under five sleeps alone. This makes it difficult for such children who do not sleep alone to sleep under the net since parents end up using it or even elder siblings.

Findings from Key Informant interviews (KIs) reveal the same information on sleeping arrangements. An interview with the Community Development Officer Sub- County revealed that parents sleep with their children in the same bed. He however said that other parents put a provision for a small bed for a child still under breast feeding next to the parents' bed. *This means that in case a child under five gets a net, it should be able to cover both the child and the parents.* This may inhibit proper use since most of the ITNs meant for children are of a small size. This leaves loopholes that are exploited by mosquitoes to penetrate and cause harm to children.

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Children above 3 years sleep alone while others sleep with their elder brothers and sisters. When the parent buys a bed, priority is given to older children leaving the under-fives sleeping on the floor. This is due to the culture in Africa as indicated earlier where seniority and the benefits that go along with seniority is in most cases based on age. Such a culture leaves out children when it comes to use of certain resources that are limited within the household.

Disruption of sleeping arrangements**Table 3: Showing where visitors sleep**

Place	Frequency	Percentages
In the sitting room	22	25
Slept with children	27	30.7
In the children bed room	13	14.8
Not applicable	26	29.5
Total	88	100

Source: Primary Data 2022

As indicated in the table 3, 25 percent slept in the sitting room, 30.7 percent slept with children and 14.8 percent slept in the children's bed room. This means that when visitors sleep in the children's room, children are displaced. Respondents were further asked where children sleep when visitors sleep in the children's bed room and 12 percent mentioned that children sleep on the floor in the sitting room and 1.1 percent mentioned that children sleep with their older siblings. This implies that visitors within the household are given first priority compared to children. This leaves children vulnerable to mosquito bites since they cannot hang the nets in the sitting room where there are no supportive mechanisms for net hanging.

This practice affects ITN utilization in households with children the under-five. These findings are similar to the findings of a study done in Western Kenya by Alaii et al 2003, where sleeping arrangements were being disrupted by visitors. As visitors come and go, ITNs may not be moved to ensure coverage of children as sleeping arrangements change and the relative status of house occupants varies (a child may be allowed to use his or her ITN only when no adult is visiting). This exposes the child to mosquito bites that consequently causes malaria hence accounting for persistent high death rates due to malaria among the under-fives despite the wide spread campaign on ITN usage. It should be noted that there are social cultural factors that were found in this community to be disrupting sleeping arrangements and thus expose the children under five years to mosquito bites despite the fact that some of them may already be having ITNs. When a family member dies, close relatives and neighbours spend four days morning by spending the night at the burial home. This exposes children under five to mosquito bites since some of them do spend the night with their mothers at the burial home for four days without any protection against mosquito bites. That is to say why the child mortality rate in Isingiro District is so high accounting for 90/1000 live births.

Supervision of children**Table 4: Influence of marital status on supervision of children**

Marital status	Supervision of children		Total
	Yes	No	
Single	3(3.4%)	0	3(3.4%)
Married	59(67.0%)	6(6.8%)	65(73.9%)
Widower	1(1.1%)	1(1.1%)	2(2.2%)
Divorced /separated	7(8.0%)	2(2.3%)	9(10.2%)
Living together/cohabiting	7(8%)	2(2.3%)	9(10.2%)
Total	77(87.5%)	11(12.5%)	88(100%)

Source: Primary Data 2022

As indicated in the table 4, the majority of the respondents who did the supervision of children were those who were married accounting for 67 percent of the total number of respondents. Having the majority of respondents who supervise children while sleeping being the married people rises out of the social fact that the institution of marriage is the main socially sanctioned relationship through which children are expected to be raised into and supervision and care of children being the core roles supposed to be played by parents therein. That's why for instance 1 out of 2 (50 percent) of the widowed were not supervising their children. This means that in such households where supervision of children at night is lacking, proper utilization of ITNs may not be realised hence exposing the under-fives to mosquito bites.

Table 5: Showing who supervises the under fives

Person responsible	Frequency	Percentages
Father	6	6.8
Mother	66	75
Elder siblings	5	5.7
Grand father	2	2.3
Not applicable	9	10.2
Total	88	100

Source: Primary Data 2022

As presented in the table 5, 75 percent of the respondents mentioned that it is mothers who supervise children, 6.8 percent fathers, and 5.7 percent elder siblings. This leaves the role of supervision of children mostly in the hands of mothers who are already burdened by other household chores. Because of the busy schedule of mothers in the household, they end up forgetting to cover children under the net (Christopher et al., 2022). This affects the effectiveness of ITNs in the household as consistence is compromised with since the responsibility is not shared equally.

Utilization of Mosquito Nets

ITNs are currently the recommended approach to preventing malarial episodes in under-fives. They are very effective because of they prevent under-fives from mosquito bites and also kill mosquitoes on contact if used consistently and correctly. This study recognized the fact that not all mosquito nets used in the community were

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ITNs and therefore made attempts to establish general usage of mosquito nets prior to critical analysis of ITNs. In this sub-section, focus is put on possession of any kind of mosquito net, number of nets per household, ownership of nets, utilization of nets among the under-fives, consistency in net usage, reasons for not using mosquito nets and decision making in regard to who should use the net within the household

Possession of mosquito nets

Table 6: Influence of education on mosquito net possession

Education level	Net possession		Total
	Yes	No	
No education	8 (9.1%)	11 (12.5%)	19 (21.6%)
Primary level	28 (31.8%)	19 (21.6%)	47(53.4%)
Secondary level	10 (11.4%)	5 (5.7%)	15(17%)
Post secondary	3 (3.4%)	2 (2.3%)	5(5.7%)
Vocational	1 (1.1%)	1 (1.1%)	2(2.3%)
Total	50(56.8%)	38 (43.2%)	88(100%)

Source: Primary Data 2022

As presented in the table 6, the majority of the respondent's 31.8 percent who had any kind of nets in their households had finished primary education. This is due to the obvious reason that the majority of the study participants had gone up to primary level. When the results presented in the table above are analysed critically, you find that respondents who had no education were least likely to possess the nets compared to those who had some level of education. Out of 19 respondents who had no education, 11 (57.9 percent) had no nets. Whereas at least more than half of the respondents who had attained some level of education had nets in their households. For Instance, 10 (66.7 percent) out of 15 respondents who had finished secondary education had any kind of net. This suggests that education influences possession of nets in this study population.

Table 7: Influence of occupation on net possession

Occupation	Net Possession		Total
	Yes	No	
Farmer	34(38.6%)	28(31.8%)	62(70.5%)
Salaried	6(6.8%)	3(3.4%)	9(10.2%)
Casual worker	3(3.4%)	3(3.4%)	6(6.8%)
Trader	5(5.7%)	1(1.1%)	6(6.8%)
Unemployed	3(3.4%)	1(1.1%)	4(4.5%)
Student	0	1(1.1%)	1(1.1%)
Total	51(58%)	37(42%)	88(100%)

Source: Primary Data 2022

A critical analysis of the table 7 reveals a relationship between possession of nets and occupation of respondents exists. Although respondents engaged in farming form the majority of study participants and therefore majority of those who possessed nets (38.6 percent), they are also the majority of those who did not possess any kind of net. It

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should be noted that traders are more likely to possess any kind of net. Out of 6 respondents who were traders, 5 (83.9 percent) had nets in their households.

Table 8: Number of nets per household

Number of nets	Frequency	Percentage
More than 3	9	10.2
3 Nets	2	2.3
2 Nets	5	5.7
1 Net	34	38.6
Not applicable	38	43.2
Total	88	100

Source: Primary Data 2022

As seen from the table 8, only 10.2 percent had more than 3 nets in their households, 2.3 percent had 3 nets, 5.7 percent had 2 nets and the majority 38.6 percent had only 1 net in the household. This means that the majority of the household members do not have nets as one net cannot be shared among all of them. Number of people under one net was found to range from 1 to 6 people as 22.7 percent slept 2 people in one net, 14.8 percent 3 people and 9.1 percent 4 people in one net. This does not provide for effective usage of the mosquito net due to overcrowding of the net yet most of the net possessed were found to be single as shall be seen in the subsequent sections. Respondents were further asked to mention who in the household sleeps under the net.

Table 9: Showing who sleeps in the net within the household

who sleeps in the net	Count	Percentage of responses
0 – Year olds (0 – 11 Months)	12	12.6
1- Year olds (12 – 23 Months)	16	16.8
2 – Year olds (24 – 35 Months)	12	12.6
3 – Year olds (36 – 47 Months)	2	2.1
4 – Years olds (48 – 59 Months)	7	7.4
Children 5 – 14 Years	3	3.2
Pregnant Women of reproductive age (15 – 49 Years)	2	2.1
Parents	41	43.2
Total	95	100

Source: Primary Data 2022

As presented in the table 9, parents form the major group of people in the household who sleep under the net. Parents account for 43.2 percent of people in the household who sleep under the net. It should be noted however that generally children under five sleeps under the nets since if grouped together account for 12.6 percent for those between 0-11 months, 16.8 percent (12-23 months), 12.6 percent (24-35 Months), 2.1 percent (36-47 months) and 7.4 percent (48-59months). The higher percentage of parents sleeping in nets is due to the fact that most of the parents sleep with the children still breast feeding and in most cases are covered under the same net.

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Ownership of ITNs**Table 10: Types of nets used in the household**

Type of net	Frequency	Percentage
Ordinary net	18	20.5
Ever treated net	1	1.1
ITN/Currently treated net	31	35.2
Not applicable	38	43.2
Total	88	100

Source: Primary Data 2022

In order to know the actual type of net used in the household, respondents were cross examined by asking the type of net currently being used in the household. As shown in the table above, only 35.2 percent were using ITNs/currently treated nets, 1.1 percent ever treated nets and 20.5 percent ordinary nets. Different reasons were given as to why some people were not using Insecticide treated nets. They include; not having money to buy the ITNs (36.4 percent) and stopped using it because mosquitoes had reduced. It was also interesting to find out that some people did not know where ITNs are and others had not bothered to get nets. It should also be noted that ITNs being slightly expensive compared to non-treated nets made some people to buy just ordinary nets and others did not know whether the net was treated or not. For those who knew treated nets mentioned that treated nets have a chemical which can be felt by smell.

Table 11: Reasons for not using treated mosquito nets in the household

Reason	Frequency	Percentage
I don't have money to buy the net	32	36.4
Mosquitoes had reduced	1	1.1
Have not bothered to get a net	4	4.5
I have never known where they are	3	3.4
That's what I could afford	2	2.3
Not enough for both of us	1	1.1
Don't know whether it is treated or not	2	2.3
Not applicable	43	48.9
Total	88	100

Source: Primary Data 2022

As seen from the table 11, caregivers gave different reasons as to why they were not using mosquito nets. Key informants gave similar reasons as to why some households were not using nets. The community development officer had this to say *"Some people drink a lot and forget to put on a net. The net can be there but because the husband and the wife come home when drunk, they forget to put it on"*.

Under-fives and net usage

In order to capture utilization of ITNs among the under-fives, respondents were asked if their children under five years sleep under ITNs. It was found out that 39.8 percent of the respondents had their under-fives sleeping under

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the net, while 28.4 percent had the nets in the household but children under five years were not sleeping under the ITNs, and 31.8 percent did not have the nets within the household. The percentage of children under five years sleeping under the net in this study is higher than the percentage of children under five years in the study carried in Iganga district Eastern Uganda where 22 percent of the total respondents in the survey reported that their children slept under mosquito nets. In the same study, out of 29 respondents who reported using nets, only 11 respondents reported that children were sleeping under ITNs. This higher percentage of children under five sleeping under ITNs could be due to the fact that ITNs had been given free of charge in this study community to children under five and pregnant women the year before this research. This means that most of the under-fives got a chance to own an ITN.

Consistency in net usage

Table 12: Consistence of under-fives in sleeping under the nets

Period	Frequency	Percentage
Throughout the night during the season for mosquitoes	6	6.8
All year round	10	11.4
Most part of the night	13	14.8
Some part of the night	8	9.1
Not applicable	51	58
TOTAL	88	100

Source: Primary Data 2022

As seen from the table 12, there are lots of inconsistencies in net usage. Only 11.4 percent of the respondents mentioned that their children sleep under the net all year round, 14.8 percent use the net most part of the night, 9.1 percent some part of the night and 6.8 percent throughout the night during the season of mosquitoes. These results clearly indicate that consistency in using the mosquito nets among the under-fives is still low. Yet for ITNs to be effective in preventing malaria, children under five years are supposed to consistently sleep under them. These findings are quite different from the findings of a study done in Iganga District Eastern Uganda where consistency of sleeping in ITNs was relatively high as majority 63percentof respondents reported that their under-fives slept under mosquito nets throughout the night at all times, while 20 percent reported that the under-fives slept under the mosquito nets throughout the night but only during the seasons for mosquitoes (Kagaha, 2008). This therefore accounts for high malaria incidents among children.

Table 13: The relationship between feelings about use of ITNs in malaria prevention and presence of mosquito nets in the household

Feeling about use of ITNs in prevention of malaria	Presence of mosquito nets in the household		Total
	Yes	No	
Effective	13(14%)	1(1.1%)	14(15.1%)
Effective	28(31.8%)	2(2.3)	30(34.1)
Average	7(8.0)	2(2.3%)	9(10.2)
Less effective	2(2.3%)	1(1.1%)	3(3.4%)
Not effective at all	1(1.1%)	2(2.3%)	3(3.4%)

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Not applicable	0	29(33%)	29(33%)
Total	51(58%)	37(42%)	88(100%)

Source: Primary Data 2022

As presented in the table 13, 34.1 percent believed that ITNs are effective in prevention of malaria, 15.9 percent very effective, 10.2 percent average and only 3.4 percent less effective. Therefore, among the respondents who had used ITNs before, largely believe that ITNs are effective in the prevention of malaria. Only 3.4 percent who are the minority perceived ITNs as not effective at all. The cross tabulation between the perceptions of respondents and net possession in the household reveal a strong relationship between the two variables. The majority of the respondents who had the nets strongly believed that ITNs are effective in malaria prevention among the under-five compared to those who did not have nets in their households.

Table 14: Reasons for perceived feelings about ITNs

Perceived feelings	Frequency	Percentage
Protect children against malaria	25	28.4
Sometimes I suffer from malaria	10	12.5
Spent a long time without falling sick	10	11.4
Mosquitoes can bite you when still outside	2	2.3
No applicable	30	34.1
None response	10	11.4
Total	88	100

Source: Primary Data 2022

Those respondents who felt that ITNs are effective in prevention of malaria were basing on the fact that they had spent a long time like 2 years without falling sick and that mosquito nets protect children against malaria. These are lived experiences of respondents who had used the ITNs for some time. However, those respondents who felt that ITNs are not effective in prevention of malaria based on the fact that mosquitoes can bite you when still outside the net; and that sometimes they suffer from malaria despite sleeping under the net. Suffering from malaria despite sleeping under the net could be due to the fact that some ITNs were not retreated or not even ITNs, others have holes in them caused by rats as mentioned by some key informants which allow mosquitoes to penetrate through. Respondents were further asked what other people say about mosquito nets in order to obtain wider views on ITNs in this study community. The views of other people in the community can allow or even hinder usage of ITNs depending on how they influence someone's perceptions. The results are indicated in the table below.

Table 15: Showing what people say about ITNs

Variable mentioned	Count	Percentage of responses
They are good if availed to every one	57	44.5
Cause a lot of heat	14	10.9
Cause suffocation	7	5.5
Affect the eyes if still new	2	1.6
Don't know how to hang them	47	36.7
Non response	1	0.8

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Total	128	100
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Source: Primary Data 2022

More than one response was possible. As presented in the table above, 44.5 percent who are the majority mentioned that other people think that ITNs are good if availed to them, 36.7 percent say that they do not know how to hang the ITNs and some people think that ITNs cause a lot of heat, suffocation and affect the eyes if still new. The findings of this study about the feelings and perceptions of ITNs within the household have some similarity with findings found in the previous studies done on ITNs. The occurrence of negative side effects is not a new phenomenon in the use of ITNs within the households.

Conclusions

ITNs affordability remains a big challenge to households with children under five. Though, the government policy on mosquito nets places much emphasis on children under five and pregnant women, ITNs remain inaccessible to majority of the children under five. Significant resources have been directed towards addressing affordability barriers through providing free ITNs to vulnerable groups, but the success of these interventions depends largely on the degree to which other barriers to access are addressed. Key barriers on the supply side included: distance from ITN outlets where they are sold; limited acceptability of ITNs provided through interventions; unavailability in the commercial sector and the price. Infrastructure, information and communication played a central role in hindering access affordability.

Recommendation

Whilst in this study community ITNs had been distributed freely to children under five years and pregnant women, in the future perhaps free ITNs should be expanded to all individuals within all households to avoid net grabbing. Such a strategy can successfully eliminate grabbing of nets that are meant for children under five years. Perhaps the most effective strategy to ensure effective utilization in all households with children under five years should provide a mix of public and private sectors working together to create a sustainable complementary system. Yet it is pointless to talk of how nets should be distributed to all household members with children under five years financially if the facilities to distribute them remain inadequate.

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