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**Knowledge, Attitudes and Practices of Mothers  
Attending Child Health Clinic at Katooke HCIII  
in Kyenjojo District on Malaria Prevention and  
Control in Children Under-Five Years**

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**ABSTRACT**

Malaria is the leading cause of morbidity and mortality in Uganda and is responsible for up to 40% of all outpatient visits, 25% of all hospital admissions and 14% of all hospital deaths. From Unpublished medical records of Katooke health Centre III (2016) indicated that approximately 15 malaria cases among under-five Years children reported every week, equivalent to 720 cases that year. A quantitative descriptive cross-sectional study employed simple random sampling technique to select mothers and care takers of under-five Years children as participants in the study to recruit 67 respondents from whom data was collected using a structured questionnaire. The results indicated that; majority of mothers and care takers were aged 20-30 years (50.7%), biological parents (86.4%). With low levels of education (with 66.6% primary level, and 22.3% none at all), peasants (80.5%). Majority (95.5%) had ever heard about malaria in under five years children; mothers knew fever (89.5%), vomiting (74.6%) and diarrhea (67.1%) as signs of malaria. Mothers lacked knowledge on vulnerable age group (<5years children). Majority (80.5%) were confident to use malaria prevention and control measures, where (83.5%) strongly agreed that sleeping under ITNs prevents malaria in <5, and (64.1%) strongly agreed that chemical spraying prevents malaria in under five. Whereas there were misconceptions in (67.1%) of mothers that contaminated food cause malaria, (38.8%) that immunization prevents malaria. Majority (59.7%) slashed near homes to prevent malaria in under five; only (46.2%) slept their < 5 children under ITNs. Mothers (62.6%) go to health unit for treatment of malaria in <5, however, majority (35.8%) seek health care late by 13-18 hours. The study concluded that, Mothers had knowledge on malaria prevention; they knew symptoms of simple malaria like fever, but lacked knowledge on signs of severe and complicated malaria like jaundice, parlor, organomegaly and convulsions. They lacked knowledge on vulnerability to malaria of under five years to adults. Had positive attitudes towards ITNs, Spraying, while had misconceptions on contaminated food, misty weather as causes of malaria Knowledge on malaria prevention in under five was high, but realistic practices on malaria prevention and control were very low, where majority did not use ITNs, and in case of suspected malaria, they delayed to seek health care early.

**Keywords:** Malaria, Mothers, Immunization, Children, Knowledge.

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**INTRODUCTION**

Malaria is a mosquito born protozoan infection of humans and other animals caused by parasitic protozoa of genus *Plasmodium* [1-5]. Approximately, out of 3.4 billion people worldwide who are exposed annually, 1.2 billion are

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mainly children 0-5 years, and pregnant women [6-10]. By 2009, malaria was one of devastating diseases killing more than 1 million people annually where pregnant women, children, and immune-compromised individuals had the highest morbidity and mortality, and Africa bearing the heaviest burden [3-14]. Children and Pregnant women are 3 times more likely to suffer from severely as a result of malarial infection compared to their counterparts [15-20]. In malaria endemic areas, it is estimated that at least 25% of children under 5 years are infected with malaria, with the highest risk of infection and morbidity in neonates and infants [20-30]. This being because, in high transmission areas, partial immunity is acquired at childhood. However, if this is does not happen, there is rapid progression of disease to severity and death among children being enhanced by severe anemia, hypoglycemia, cerebral malaria which are more commonly seen among children under five than their adult counterparts [30-36]. There are five species of malaria parasites which infect humans namely: *Plasmodium falciparum*, *Plasmodium vivax*, *Plasmodium ovale*, *Plasmodium malariae* and *P. knowlesi* [30-36]. Of these, *P. falciparum* is the most virulent malaria parasite in Uganda [17]. Among children, WHO recommended Insecticide-treated nets to be provided as early as possible to all households living in malaria endemic areas, epidemic and disaster situations and according to perceived need in the locality and be used throughout pregnancy to mothers, and postpartum to neonates and children [16].

## METHODOLOGY

### Study Design and Rationale

Quantitative Cross-sectional study design was used in which the researcher determined knowledge, attitudes and practices on mothers attending child clinic in Katooke health Centre III for data to be collected once. This was to allow quick data collection and getting the primary data directly from mothers and care takers of under five years children as direct data source.

### Area Study

The study was carried out at Katooke health Centre III, in Katooke sub-county, Kyenjojo district.

### Study Population

The study population was mothers and caretakers of under- five year's children attending child C Clinic in Katooke health Centre III. This is because they are the first contact for these children right from birth and throughout their growth, hence deemed direct assessors of health and wellbeing for these children and force for implementation of preventive measures on behalf of these children.

### Sample Size Determination

The researcher determined the sample size of the population using the Fisher's formula, which is shown below;

$$n = \frac{Z^2 pq}{d^2}$$

Where;

n= sample size

Z = standard normal deviation at the required degree of accuracy which at 96% is 1.96 (3.8416)

P = proportion of women preventing malaria in under 5 years children (P = 0.5) constant

q = 1-p (Percentage of women that did not prevent malaria in under five children) q = 1- 0.5 = 0.5

d = level of precision 12% = 0.12

$$n = \frac{1.96^2 \times 0.5 \times 0.5}{0.12 \times 0.12} = 67$$

Therefore, the sample size was 67

### Sampling Procedure

Simple random sampling method was used for quantitative data collection. To reduce bias, the number of mothers of children under five-year in Katooke sub-county attending the young child health clinic at Katooke health Centre III were selected. "Yes" and "no" words were written on similar pieces of paper, folded them and put them in a basket in a ratio of 67:67. Then they chose one at a time with replacement, those who randomly picked "yes" were given questionnaires to fill until we got 67 respondents equivalent to the sample size.

### Inclusion Criteria

The participants included all consented mothers and care takers of under-five years children with sound mind, that were attending Katooke health Centre III during time of data collection. Those who could not read and write were assisted in filling the questionnaire, interviewing them using the understandable language.

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**Exclusion Criteria**

The study excluded all those who were mentally ill and those who were deaf and without sound mind that could not make them to consent.

**Research Instruments**

A self-developed questionnaire with both open and close ended questions was designed and administered to the selected respondents who had consented to participate in the study. The researcher provided guidance and interpretation where there was a need through one-on-one interview for proper and accurate data collection.

**Data Collection Procedure**

After the approval of the proposal by the research committee of school of nursing sciences, an introductory letter was issued which the researcher used for seeking permission from Katooke health center III. Before sampling process was done, the researcher introduced himself to the prospective participants and read to the individual participant the consent form that detailed the title and purpose of the study as well as the rights of the participant. Whenever a participant agreed to be interviewed he/she was asked to provide written consent by signing or fingerprinting. Whenever there was refusal to participate the interview would not proceed.

After obtaining the written consent, the researcher entered the questionnaire serial number and date of interview and proceeded from the first up to the last question using a language understood by the participant. The researcher entered responses given by the participant by ticking the appropriate responses and entering the same number in to the coding box. This was done to ensure data quality as the response to number ticked is supposed to be the same as the one entered in the coding box. The researcher reviewed the questionnaires on a daily basis to ensure they are being completed correctly and any errors corrected to avoid being repeated. The process of data collection was continued until the sample size was achieved. All completed questionnaires were kept safe by the researcher until time of analysis.

**Data Analysis**

The data obtained was recorded and checked for completeness and accuracy on a daily basis after data collection at the end of the day. This was followed by coding and entry of the data using Epi info 3.4.1 software for Windows. Then data was compiled and stored in a computer Microsoft Excel and Microsoft word where they were converted to frequencies (tables) and figures which have been presented in tabulations, pie charts and histograms. And entry into Statistical Package for Social Scientists (SPSS) version 16.0 software for analysis. Analysed data was interpreted manually to bring out the shown information to determine knowledge, attitudes and practices on malaria prevention and control.

**Ethical Consideration**

An introductory letter was obtained from the school of nursing administrator to authorities of Katooke HCIII for approval, then head of department of YCC (Young child clinic). Also the researcher sought permission from the participants by introducing himself and his assistant to participants, and obtaining their informed consent before carrying out the data collection. The participants were assured that all the information they gave was confidential and their participation were very important.

**RESULTS**

Mothers' demographic characteristics were assessed as deemed focal to influence malaria prevention and control knowledge, attitudes and practices. They include age, whether they are parents of children or just caretakers, level of education, tribe, religion, occupation and parity.

**Table 1: Demographic characteristics of study population n=67**

Demographic characteristic	frequency(n)	Percentage (%)
<b>Age.</b>		
<20	2	2.9
20-30	34	50.7
30-40	20	29.8
Above 40	11	16.4

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<b>TOTAL</b>	<b>67</b>	<b>100</b>
<b>care status</b>		
biological parent	58	86.5
caretaker/relative	9	13.5
<b>TOTAL</b>	<b>67</b>	<b>100</b>
<b>level of education</b>		
none	15	22.3
primary	40	66.6
secondary	8	11.9
tertiary	4	5.9
<b>TOTAL</b>	<b>67</b>	<b>100</b>
<b>Tribe.</b>		
mutooro	24	35.8
munyooro	21	31.3
munyankole	4	5.9
mukyiga	10	14.9
others	8	11.9
<b>TOTAL</b>	<b>67</b>	<b>100</b>
<b>Religion.</b>		
Muslim	5	7.4
catholic	28	41.7
protestant	23	34.3
Pentecostal	8	11.9
others	3	4.4
<b>TOTAL</b>	<b>67</b>	<b>100</b>
<b>Occupation.</b>		
peasant	54	80.5
businesswoman	11	16.4

civil servant	2	2.9
<b>TOTAL</b>	<b>67</b>	<b>100</b>
<b>Parity.</b>		
<b>1</b>	<b>8</b>	<b>11.9</b>
<b>2-3</b>	<b>20</b>	<b>29.8</b>
<b>4-6</b>	<b>32</b>	<b>55.2</b>
<b>&gt;6</b>	<b>07</b>	<b>10.4</b>
<b>TOTAL</b>	<b>67</b>	<b>100</b>

Majority of the respondents were aged between 20-30 years 34(50.7%), biological parents dominating with 58(86.4%). majority of mothers had at least had primary education, with 40(66.6%), followed by those that had not had any formal education with 15(22.3%), Catholics and protestant formed the majority of religious faith with 28(41.7%) and 23(34.3%) respectively, while other religions being composed by remaining percentages. Basically, the biggest percentage of the respondents depend on subsistence farming/peasants with 54(80.5%), while a few were businessmen/businesswomen and civil servants with 11(16.4) and 2(2.9) percentages respectively. 4-6 parity mothers formed the mean 32(55.2%) parity range, whereas Para 1, and Para 6 mothers formed least and slightly differing ranges with 11.9 and 10.4 percentages respectively.

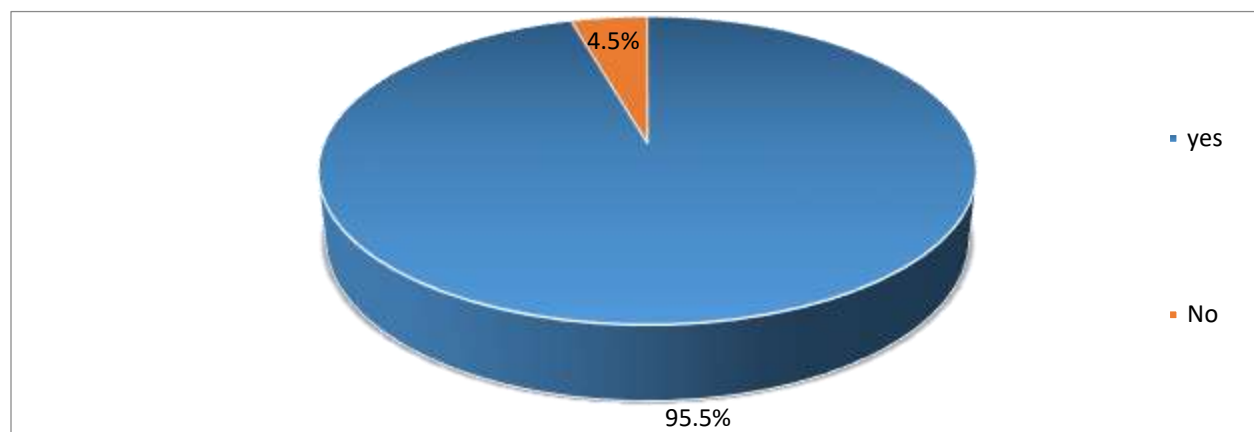
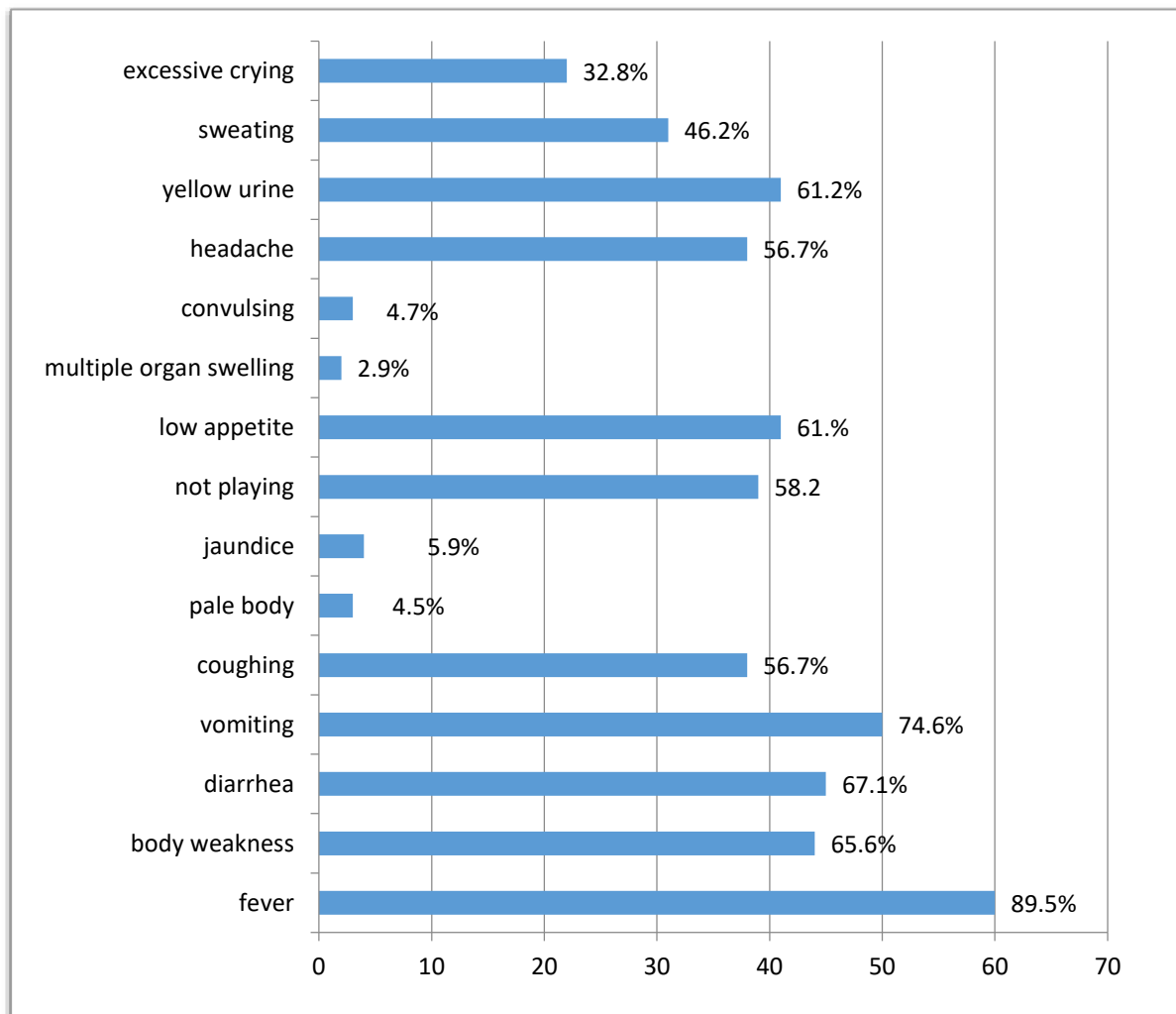


Figure 1: Heard about malaria in under five years children

Majority of the respondents 64(95.5%) had heard about malaria in less than five years old children, while a few 3(4.5%) had never heard about it.



**Figure 2: Knowledge on malaria presentation n=67**

Majority of the respondents knew fever and vomiting and diarrhea as common signs of malaria in under five years children with 60(89.5) and 56(74.6) and 45(67.1) percentages respectively. While jaundice, pale body, multiple organ swelling and convulsions rarely known as signs of malaria. Others widely known signs of malaria in children under five years were low appetite, yellow urine not playing and coughing by 41(61.2), 41(61.2) and 39(56.7) percentages respectively.

**Table 2: Knowledge on most vulnerable age groups n=67**

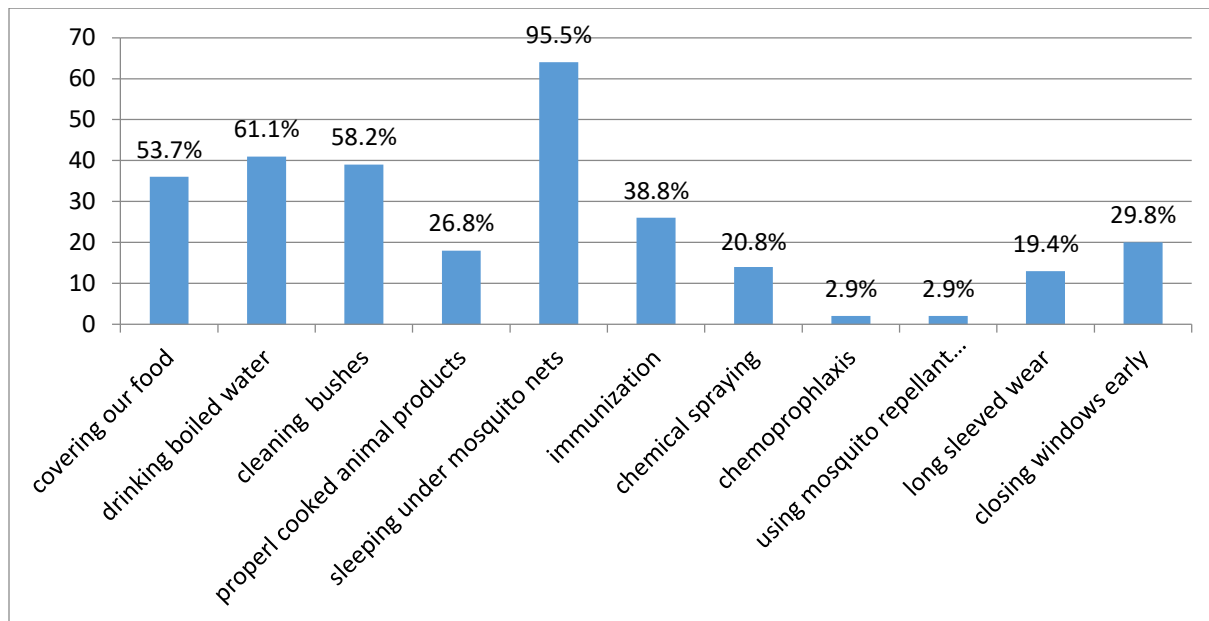
Age group	Ranges	frequency(n)	Percentage (%)
	0-5	13	19.4
	6-10	11	16.4
	11-15	17	25.3
	16-20	6	8.9
	above 20	20	29.8

Majority of the Mothers 20(29.8%) knew malaria being more dangerous in adults above 20 years while only a few 13(19.4%) knew age group 0-5 years as more vulnerable to malaria dangers than adults.

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Figure 3: Knowledge on malaria prevention methods. n=67



Majority of the respondents 64(95.5%) knew about sleeping under mosquito nets as a preventive measure for malaria more than others methods like chemoprophylaxis and using mosquito repellent which were reported as low as 2(2.9%) and 2(2.9%) respectively.

Table 3:Source of knowledge on malaria prevention.n=65

source of knowledge	frequency(n)	Percentage (%)
Radio	13	19.4
News paper	01	1.4
Relatives	19	28.3
Health workers	16	23.8
VHT person	06	8.9
Religious leader	07	10.4
Cultural leader	01	1.4
Television	01	1.4

Majority of the respondents 19(28.3%) had had knowledge about malaria prevention from their relatives, followed by 16 (23.8%) from health workers, 13(19.4%) from radios, and the least 1(1.4%) from television and cultural leaders.

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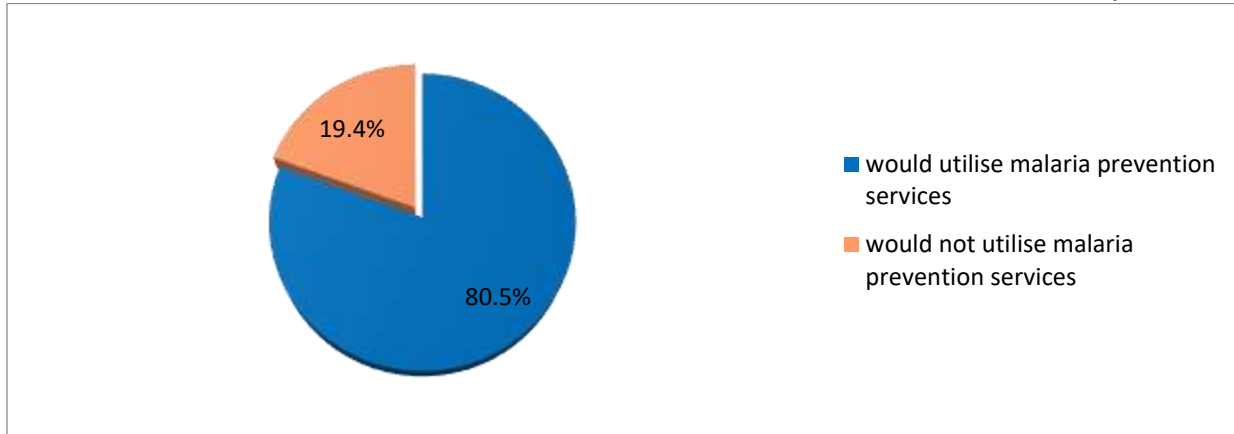


Figure 4: Confidence in malaria prevention practices

Majority of the respondents 54(80.5%) were confident enough to utilize malaria prevention services while 13(19.4%) would not utilize malaria prevention services.

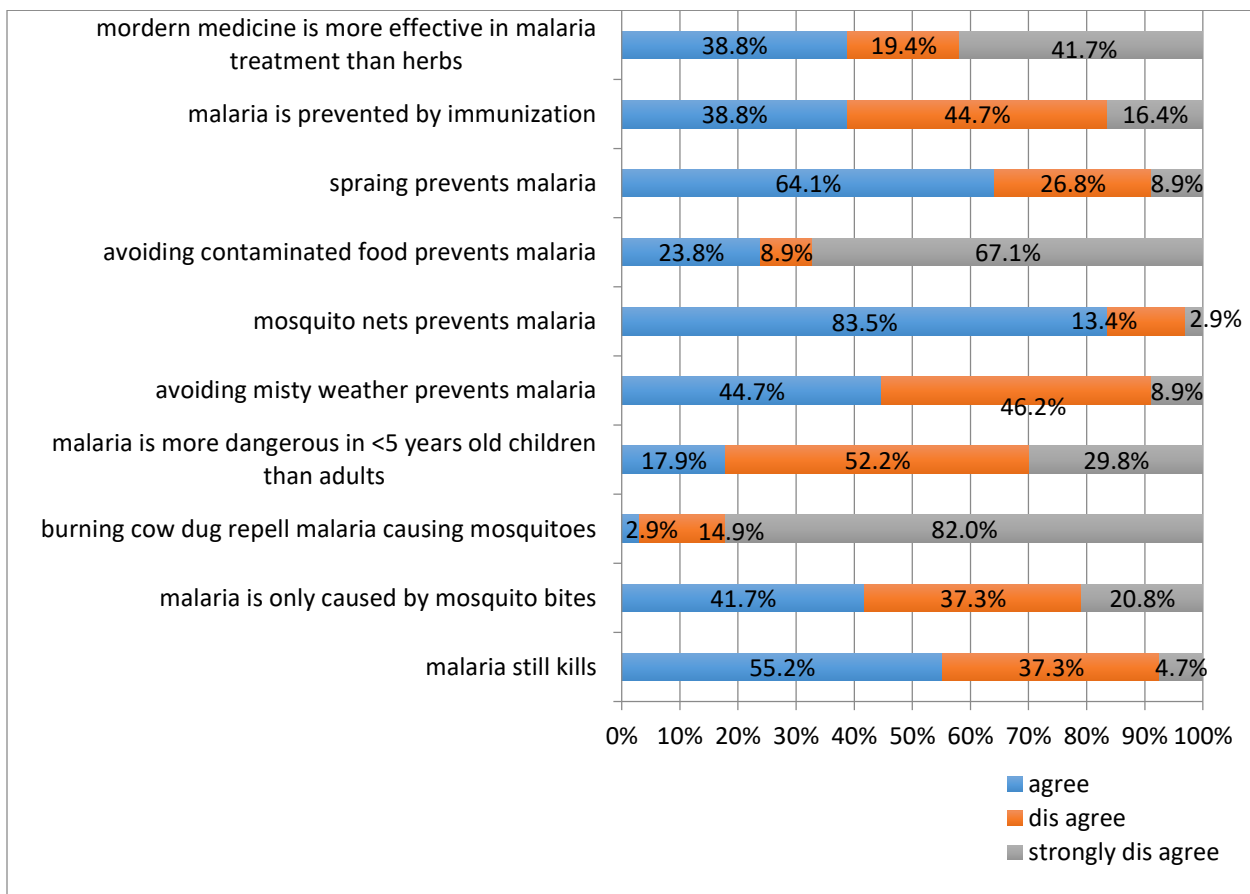


Figure 5; Attitudes towards malaria causes and prevention methods n=67

Majority of the respondents 56(83.5%) agree that mosquito nets prevents malaria, 9(13.4%) disagree and 2(2.9%) strongly disagree that sleeping under mosquito net cannot prevent malaria from affecting the lives of children under five, this was followed by spraying 43(64.1%) Whereas other methods were also mentioned by the majority of the

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respondents as positive measures like avoiding contaminated foods 45(67.1%) agree, 6(8.9%) disagree, and 16(23.8%) strongly disagree, immunization 26(38.8%) agreed, 30(44.7%) disagreed, and 11(16.4%) strongly disagreed.

**Table 4: Malaria prevention practices by mothers to children under five n=67**

prevention practice	frequency(n)	Percentage (%)
sleep under insecticide treated mosquito net	31	46.2
house spray with chemical insecticides	00	00
slashes long bushes around home	40	59.7
drainage of near home water reservoirs	15	22.3
take intermittent presumptive chemoprophylaxis	01	1.4
do regular testing and treatment of malaria	04	5.9
takes pre-travel prophylaxis	00	00
long dressing wear while outside when late evening	01	1.4
uses mosquito repellent Vaseline	00	00
closes windows early	23	34.3
planted mosquito repellent plants in compound	03	4.4

Majority 40(59.7%) slashes bushes around homes as malaria control measures, 31(46.2%) sleep under mosquito nets, 15(22.3%) drains water ponds near homes, while mosquito repellents, chemoprophylaxis, intermittent presumptive treatment, and house spray with insecticides were not employed by any community member as a malaria prevention measure.

**Table 5: Sources of care for malaria in under five years. n=67**

source of care	frequency(n)	Percentage (%)
health unit	42	62.6
VHT/CBHP	03	4.4
Spiritual leader	10	14.9
herbalist	12	17.9
others	00	00

Majority of the respondents 42(62.6%) go to health unit for treatment when they suspect malaria in under five years children, 10(14.9%) go to spiritual leaders for treatment when they suspect malaria, while 3(4.4%) and 12(17.9%) use VHT and herbalist respectively if they suspect malaria in under five years old child.

Table 6: Time taken to Seek health care for malaria suspected under five years child. n=67

time taken to seek care for malaria	frequency	Percentage (%)
0-6 hours	09	13.4
07-12 hours	15	22.3
13-18 hours	24	35.8
19-24 hours	19	28.3
more than 24 hours	00	00

Majority of the mothers 24(35.8%) seek health care within 13-18 hours when they suspect malaria among their under five years children, followed by those that seek health care within 19-24 hours 19(28.3%) while only 9(13.4%) of the study population seek health services for malaria in under five within 0-6 hours.

#### DISCUSSION

Majority of the respondents were aged between 20-30 years 34(50.7%), biological parents dominating with 58(86.4%). This could be because, being an average reproductive age. During this age, mothers are actively producing, hence more involved in decision making in young children including those who know about malaria prevention and control among under five years children and taking care of these children than others age groups. These findings agree with the study by Romay-Barja *et al.* [18] on knowledge of mothers on malaria prevention in under five years children in Nigeria which found out that good knowledge was increased with medium age, where as poor knowledge being common to young aged mothers. Majority of mothers had at least had primary education, with 40(66.6%), followed by those that had not had any formal education with 15(22.3%), there is a significant low level of formal education ranging from non to primary. Catholics and protestant formed the majority of religious faith with 28(41.7%) and 23(34.3%) respectively, while other religions are composed by remaining percentages. This could be the true distribution of the population as far as religious affiliation is concerned in this area. Religious has not had a great impact on malaria prevention and practices, however, how each religion teach regarding diseases, control, and treatment vary. Hence if malaria prevention and practices in this area is driven by religious affiliation will majorly be dependent on how catholic and protestant faith teach about malaria prevention and control practices. Basically, the biggest percentage of the respondents depend on subsistence farming/peasants with 54(80.5%), while a few were businessmen/businesswomen and civil servants with 11(16.4%) and 2(2.9) percentages respectively. This is a clear indicator that majority are of low social economic class. Hence in case of financial needs for medical services like transport and treatment of malaria in under five years children in good private settings, most of members in the study population may not be able which may lead to delay in seeking medical intervention causing simple malaria cases progressing to complicated cases that would be harder and more costly to manage. 4-6 parity mothers formed the majority 35(55.2%) parity, whereas Para 1, and Para 6 mothers formed least and slightly differing ranges with 8(11.9%) and 7(10.4%) respectively.

Majority of mothers 64(95.5%) knew about malaria in less than five years old children, while a few 2(4.5%) had never heard about it. The population could have got knowledge from health education by health workers hence they are expected to have good knowledge regarding malaria prevention and control. These findings are similar to a community based quantitative descriptive study in aliero, Kebbi state of northern Nigeria (2014) which found out that, there was a comprehensive knowledge on malaria prevention, (90%) of mothers had good knowledge on mosquito behavior/bleeding areas (64.5%), resting places (70%) and biting times(81%). Majority of the respondents knew fever, vomiting and diarrhea as common signs of malaria in under five years' children with 60(89.5%) and 56(74.6%) and 45(67.1%) respectively. This implies that if an under-five Years old child presented with any of the above signs and symptoms, they are likely to seek for malaria treatment. Much as fever is a first sign in malaria, it may present with or without vomiting, and diarrhea may not present in malaria child at all unless it has an underlying cause, hence if a mother/ caretaker is not keen about other symptoms, may delay to notice sickness in a child, causing delay in seeking for health intervention which makes the cost and quality of treatment high. While jaundice, pale body, multiple organ swelling and convulsions rarely known as signs of malaria. Others widely known signs of malaria in children under five years were low appetite, yellow urine, not playing and coughing by 41(61.2%), 41(61.2%) and 39(56.7%) respectively. This not being a primary presentation of malaria may not sound so sensitive first encounter, but still a question remains, "what if malaria is complicated" implying that mothers may not seek for malaria testing and treatment in case the under-five child under their care develops jaundice, pale body, multiple organomegaly, due to knowledge deficit on signs of complicated malaria and may take long to be convinced to accept malaria treatment in such a case which may lead to further complication leading to death. Majority of the Mothers

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20(29.8%) knew malaria being more dangerous in adults above 20 years while only a few 13(19.4%) knew age group 0-5 years as more vulnerable to malaria dangers than adults. This implies that dangers of malaria in this age group are not widely known, and its complications have not been clearly elucidated. Majority of the respondents 54(80.5%) were confident enough to utilize malaria prevention services while 13(19.4%) would not utilize malaria prevention services.

Majority of the study population 56(83.5%) agree that sleeping under insecticide treated mosquito nets prevents malaria in under five years children, 9(13.4%) disagree and 2(2.9%) strongly disagree that sleeping under mosquito net cannot prevent malaria from affecting the lives of children under five, this was followed by spraying with chemicals 43(64.1%). Whereas other methods were also mentioned by the majority of the respondents as positive measures like avoiding contaminated foods agree, 45(67.1%) 6(8.9%) disagree, and 16(23.8%) strongly disagree, immunization 26(38.8%) agreed, 30(44.7%) disagreed, and 11(16.4%) strongly disagreed. This implies that of the population have confidence in effectiveness of ITNs and home spray with chemicals than other methods, hence are more likely to freely use these methods in preventing malaria in under five years children. There was a strong belief that eating contaminated food cause malaria in under five years children which this false belief may be due to knowledge gap on causes of malaria, mode of transmission and prevention. Majority 40(59.7%) slashes bushes around homes as malaria control measures, 31(46.2%) sleep under mosquito nets, 15(22.3%) drains water ponds near homes, while mosquito repellants, chemoprophylaxis, intermittent presumptive treatment, and house spray with insecticides were not employed by any community member as a malaria prevention measure. These findings in this particular community are contrarily to Fettene et al [19]'s which found out that Malaria disease can be prevented by avoiding mosquito bites through using insecticide treated mosquito nets (ITNs) and insect repellants, or with mosquito-control measures such as spraying insecticides and draining standing water [19].

The major malaria prevention method used by majority mothers to prevent malaria in under five years children is slashing, whose effectiveness is indirect in controlling mosquito –people contact hence its effectiveness depend on massive involvement in this activity and its efficiency has not been clearly been presented. Use of ITNs to prevent malaria in under five years children is still low compared to national ITN utilization data, implying that the majority of the children under five years still sleep outside ITNs, exposed to mosquito bites, and malaria with its related complications. Majority of the respondents 42(62.6%) go to health unit for treatment when they suspect malaria in under five years children, 10(14.9%) go to spiritual leaders for treatment when they suspect malaria, while 3(4.4%) and 12(17.9%) use VHT and herbalist respectively if they suspect malaria in under five years old child. Malaria parasitemia has been a major clinical diagnosis in majority of Ugandan health facilities contributing 40% of all outpatient visits, 25% of all hospital admissions and 14% of all hospital deaths.

Majority of the mothers 24(35.8%) seek health care within 13-18 hours when they suspect malaria among their under five years children, followed by those that seek health care within 19-24 hours 19(28.3%) while only 9(13.4%) of the study population seek health services for malaria in under five within 0-6 hours. There is a delay in seeking treatment for malaria if mothers have suspected malaria in under five years' children between 13-18 hours. This time can give simple malaria to progress into a complicated one, progressing of symptoms from simple fevers, lethargy, to convulsions and organomegaly. This increases cost of managing malaria in under five, and may necessitates referral from VHT and lower health centers. This may be associated in delay in referrals, transport and interventions resulting into complicated malaria and death.

### CONCLUSION

Majority of the study population had heard about malaria in under five years children. They knew fever, vomiting and diarrhea as signs of malaria in under five-year child, while jaundice, pale body, multiple organ swelling and convulsions rarely known by mothers as signs of malaria. Majority of the study population also knew Malaria being more dangerous in adults aged 20 and above than in children five years and below, they also knew sleeping in an insecticide treated mosquito net, avoiding contaminated food and immunization as malaria prevention methods. The major source of knowledge on malaria prevention and control was relatives and friends.

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