

FACTORS INFLUENCING INSECTICIDE-TREATED MOSQUITO NET UTILISATION AMONG PREGNANT WOMEN ATTENDING ANTE NATALCARE AT KAPCHORWA GENERAL HOSPITAL IN KAPCHORWA DISTRICT. A CROSS-SECTIONAL STUDY.

Paul Chemutai*, Justine Negesa

Medicare Health Professionals College, P.O. Box 16476, Kampala- Uganda.

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ABSTRACT

Background

The factors influencing utilization of insecticide-treated mosquito nets among pregnant women attending ANC at Kapchorwa General Hospital.

Methodology

A cross-sectional study of 100 respondents was used for the study. A simple random sampling technique was used and data collected using survey and interviewing methods was presented and analyzed using descriptive frequencies and percentages using Microsoft Excel and Microsoft Word.

Results

From the results, the majority 92(92%) of respondents said they knew about ITNs, the majority 58(58%) of respondents heard about ITNs from ANCs a majority 67(67%) said ITNs prevent malaria, a majority 89(89%) of respondents were willing to use ITNs, a majority 82(82%) were willing to recommend others to use ITNs, a majority 85(85%) said that sleeping under ITNs does not cause suffocation, a majority of married 92(92%) and high-income earners 65(74%), and mothers aged between 15 – 30 Years, 72(92%) were all utilizing ITNs.

Conclusion

From the results, the majority of respondents said that they knew about ITNs the majority of respondents heard about ITNs from ANC, and from the radio, the majority of respondents were willing to use ITNs, and a majority were willing to recommend others to use ITNs, majority of b married women were sleeping under ITNs, a majority of the individuals earning high income were sleeping under ITNs, and the majority of the mothers aged between 15 – 30 Years, were sleeping under ITNs.

Recommendation

Health workers and VHTs should encourage mothers to go to their nearest health facilities for antenatal visits, Health workers should health educate the mothers about the benefits of sleeping under ITNs to improve their attitude, Government should provide free ITNs to pregnant mothers to increase the utilization of ITNs.

Keywords; *Insecticide, Treated Mosquito Net, Utilisation, Pregnant Womean, Ante Natal care*

Submitted: 2023-11-22 Accepted: 2023-12-19

Corresponding author: Paul Chemutai*

Email: paulchemutai093@gmail.com

Medicare Health Professionals College, P.O. Box 16476, Kampala- Uganda.

Background of the study

The most effective means of preventing malaria is sleeping under an insecticide-treated mosquito net. An insecticide-treated mosquito net is a bed net impregnated with insecticides to protect against mosquitoes by killing and paralyzing any mosquito that comes into contact with it. The insecticide-treated nets were developed for malaria prevention by Dr. P. Carnevale and his team in Bobo Dioulasso, Burkina Faso in the 1980s.

According to the World Health Organization report on the prevalence and mortality of malaria, there were 241 million

cases of malaria in 2020 compared to the 227 million cases in 2019. The estimated mortality from malaria stood at 627000 in 2020 an increase of 69000 deaths over the previous years(WHO,2022). One of the targets was to bring about a reduction in malaria-related deaths by 50% by the year 2020 by making sure that about 80% of the targeted population utilized appropriate preventive measures like the use of LLIN to protect themselves from mosquito bites. (Clara. E, et al 2022)

According to (Sánchez E.et al 2020) ITNs have been considered to be lifesaving tools because they helped prevent nearly 68% of all malaria cases in Africa and are

responsible for saving over seven million lives. "ITNs have saved lives, prevented suffering, and brought us 2 billion steps closer to our vision of a malaria-free world", Dr. Tedros Adhanom Ghebreyesus, director general of WHO. (Sánchez E. et al 2020)

Globally, due to the effectiveness of ITNs, most malaria-endemic countries resort to free distributions in particular attention to pregnant women, a more vulnerable group. In a study conducted in Myanmar-Thailand, the rate of utilization of insecticide-treated nets by pregnant women in each state or region was below average. The lowest utilization rates have been observed in peripheral areas including Chin state (38.5%), followed by Kayah state (39.7%), and the highest utilization was seen in areas like the state along the Thailand-Myanmar border state (80.9%) and an urban area Yango region (76.2%). This shows that utilization of ITNs in some parts of Myanmar is still very low while in others it's good and others relatively good. (Aung PL. et al 2022)

In African countries, studies showed that; in different areas of Nigeria utilization of nets among pregnant women was as follows; 44.2% in Ibadan state, 35.3% in Imo state 21.3% in Edo state, and 44% nationwide. Then in Buea Health District in Cameroon at 83.4%, Ghana at 20%, the Democratic Republic of Congo at 78.4%, and Sudan at 11.5%. Utilization of bed nets by pregnant women in these areas is still low compared to expected. (Guillie, T. et al. 2019). From 316 pregnant women receiving Antenatal care at Federal Teaching Hospital Abakaliki, 180 (57.0%) owned an ITN while 136 (43.0%) did not. A greater percentage (72.9%) of those who used ITNs purchased their nets, and only 8.4% of mothers who received their ITNs free of charge used the net ($P=0.159$). Dislike by spouses (63.3%), hot weather discomfort (17.8%), and forgetfulness (17.2%) were some of the factors that contributed to pregnant women's failure to utilize ITNs. (Clara, E. et al 2022)

In a study conducted in Sodo Zuria Woreda Southern Ethiopia, of 341 pregnant women who reside in households with at least an ITN, 194 (56.89%) reportedly slept under ITNs on the preceding night of data collection day, among those who slept under ITNs 78 (40.21%) and 116 (59.79%) used their ITNs consistently. (Nadew J et al 2022)

According to studies carried out in different parts of Ethiopia, the utilization of insecticide-treated nets showed that; 72.5% were using bed nets in Damot Pulasa district, 23.2% in Oromia and Amhara region, 73.3% in Eastern Ethiopia and 53.3% in Itang, Gambella region from 2010 to 2016. On average from 2010 to 2016 only 1255 (47.2%) pregnant women utilized bed nets. The use of ITNs starting from 2010 to 2016 decreased from 83.6% to 36.5% (Malaria Journal, Vol 19.)

In East African countries like Kenya, the utilization of bed nets among pregnant women is; in Bungoma County 82.5% and then in Kilifi District 70.5%.

In Uganda, the utilization of ITN among pregnant women is 35% in the Gulu district. (Guillie, Tet al 2019) Irrespective of the government of Uganda's interventions through the national malaria control program increasing the distribution of long-lasting insecticide-treated mosquito nets which increases the level of ownership. The low results imply that the utilization of ITNs is still lacking as seen among pregnant women attending ANC at Kapchorwa General Hospital who are still having soaring cases of malaria among them.

The study therefore aims at assessing the factors influencing utilization of ITNs especially the knowledge, social economic, and demographic factors among pregnant women attending ANC at Kapchorwa General Hospital.

METHODOLOGY

Study design

A descriptive cross-sectional study design was used to collect data once and there was no follow-up of respondents. The study design was chosen because it enabled the researcher to collect a lot of data in a short period.

Study area

The study was conducted at the ANC in Kapchorwa General Hospital, Central Division, and Kapchorwa Municipality in Kapchorwa District 288.7km from Kampala. The coordinates of Kapchorwa General Hospital on the map of Uganda are; 0°23'55.0"N, 34°26'50.0"E, and the latitude is 1.389625 and longitude 34.447207. The study was carried out from July 2023 to August 2023.

Study population

The study population involved pregnant mothers of all age categories attending ANC at Kapchorwa General Hospital. A sample size was drawn by simple random sampling which helped give equal chances of selection to all participants.

Sample size determination.

The sample size of the respondents for the research study was to be determined using the (Kish, 1965) formula that is;

$$n = \frac{z^2 p (100-p)}{s^2}$$

n= the sample size considered for the study

z= the standard normal deviated of confidence interval at 95% (1.96)

p= Assumed pregnant mothers who were to be accessed among the population 85%

s= maximum error that was to be allowed in the study, which was 7%

Therefore, putting in the formula

$$N = \frac{1.96^2 \times 85(100-85)}{7^2}$$

N=99.96=100 respondents

Two respondents were added to minimize sampling Bias to make 95 participants.

Sampling technique

Random sampling technique was employed to save time and it was cost effective and also minimized Bias.

Sampling procedure

The sampling method was simple random sampling which involved selecting respondents from the study population by chance, and the lottery technique was used where yes and not written on small papers, folded and mixed through a small box. Then pregnant mothers picked one at a time and those who picked yes were selected to participate in the study.

Data collection method

The researcher used a self-administered questionnaire for respondents who can read and write and the interview guide was administered by the researcher and research assistant for those who cannot read and write. To minimize errors during data collection.

Data collection tool

The researcher adopted and used a semi-structured researcher-administered questionnaire, which consisted of both open and closed-ended questions. The open-ended questions made it easy for the researcher to get the views of the respondents while the closed-ended questions gave specific answers. The questionnaires were set in English.

Data collection procedures

The researcher asked all the respondents for their willingness to participate in the study and for those who agreed a questionnaire was administered to all who were literate thereafter with the help of the research assistant interviews were conducted with the use of an interview guide and no personal information was asked from the respondents as this was to maintain confidentiality and maintain trust with the participants.

Piloting study

The researcher employed the above methods at the Antenatal clinic to eliminate and correct the methods that were not working during the data collection processes.

RESULTS

Demographic characteristics of respondents

Quality control

The researcher ensured the quality of the research and results by pretesting the data collection tools at the ANC, A research assistant was trained to assist in Data collection and was under the guidance of the researcher which helped to save time and reduce the high possibility of error during data collection, a period of one month provided ample time for data collection during the study and having a clear inclusion and exclusion criteria.

Data analysis and presentation

Data was analyzed manually and entered electronically using the computer application Ms. Excel to give meanings and was presented in frequency tables and figures.

Ethical considerations

Relevant permission and approval were sought from the Kapchorwa district Health Officer the hospital superintendent and other concerned authorities before the study. The participants were briefed about the study to gain informed consent from the participants. This provided authorized permission and security to the researcher during the study.

Independent variables include

Factors influencing which refers to circumstances or facts that contribute to the occurrence of something.

Dependent variables include

Utilization of insecticide-treated mosquito nets: This is the action of making practical and effective use of insecticide-treated mosquito nets.

Inclusion criteria

The study included pregnant women of all age categories who would have consented to participate in the study.

Exclusion criteria

The study excluded all pregnant women at the ANC Kapchorwa General Hospital who would have not consented to participate in the study as well as those who shall ask to be paid to participate in the study.

Table 1: Shows demographic characteristics of respondents (n=100)

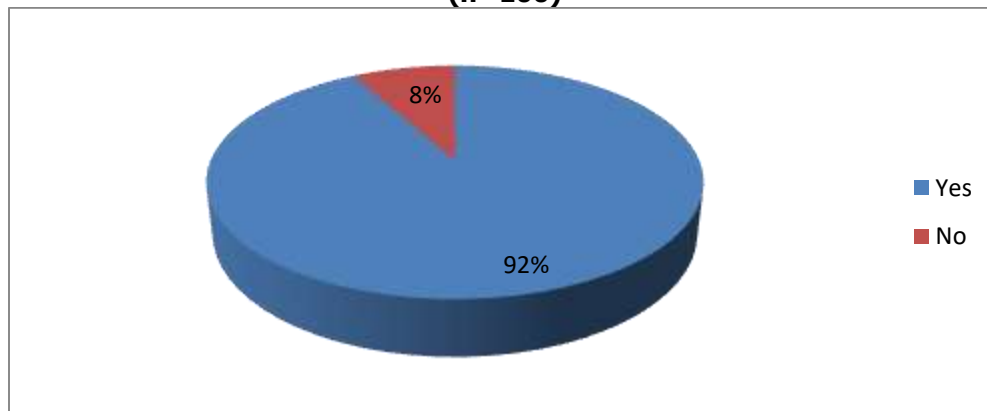
| | Variables | Frequency | Percentage |
|--------------|-----------|------------|-------------|
| Age | 15 – 20 | 12 | 12% |
| | 21 – 30 | 63 | 63% |
| | 31 – 40 | 25 | 25% |
| Total | | 100 | 100% |
| Tribe | Sabiny | 68 | 68% |
| | Mugisu | 18 | 18% |
| | Teso | 10 | 10% |
| | Others | 4 | 4% |
| Total | | 100 | 100% |
| Occupation | Housewife | 66 | 66% |
| | Teacher | 11 | 11% |
| | Farmer | 21 | 21% |
| | Others | 2 | 2% |
| Total | | 100 | 100% |

From Table 1, the majority of respondents 63(63%) were aged between 21 – 30, 25(25%) were between the age of 31-40, and the least 12(12%) were in the age group of 15-20, a majority 68(68%) were from Sabiny tribe, 18(18%)

were from Mugisu tribute,10(10%) were from Teso tribe and 4(4%) belonged to other tribes, majority 66(66%) were housewives, 21(21%) were farmers, 11(11%) were teachers and only 2(2%) were of other occupations

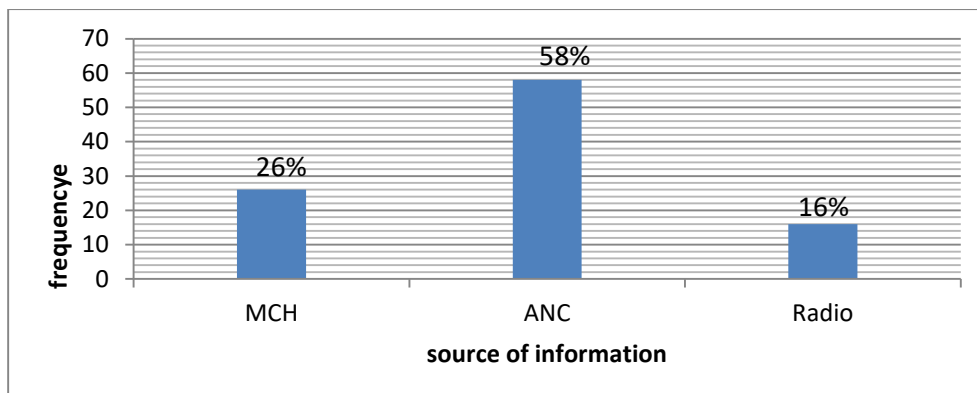
KNOWLEDGE ABOUT THE UTILIZATION OF INSECTICIDE-TREATED NETS

Figure 1: Shows the distribution of respondents by whether they know about ITNs or not (n=100)



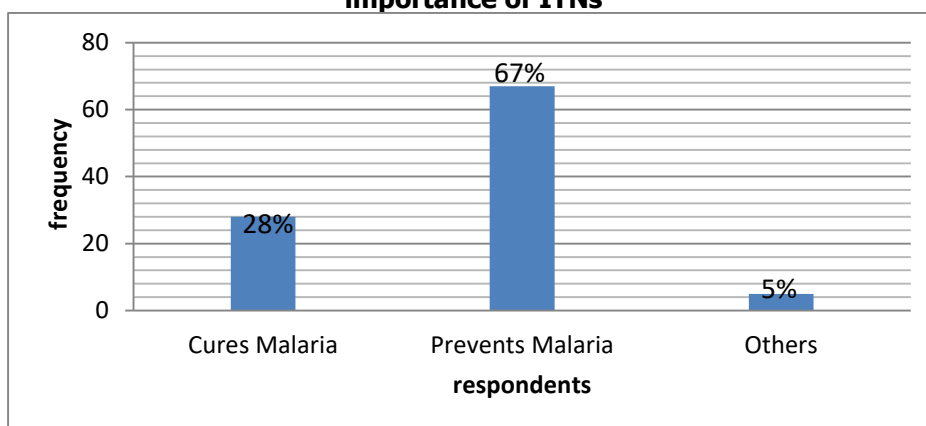
From Figure 1, the majority of 92(92%) respondents said they knew about ITNs while only 8% did not know ITNs.

Figure 2: Shows the distribution of respondents to where they heard about it from (n=100)



From Figure 2, the majority 58(58%) of respondents heard about ITNs from ANC 26(26%) heard from MCH, and only the least 16(16%) heard from the radio,

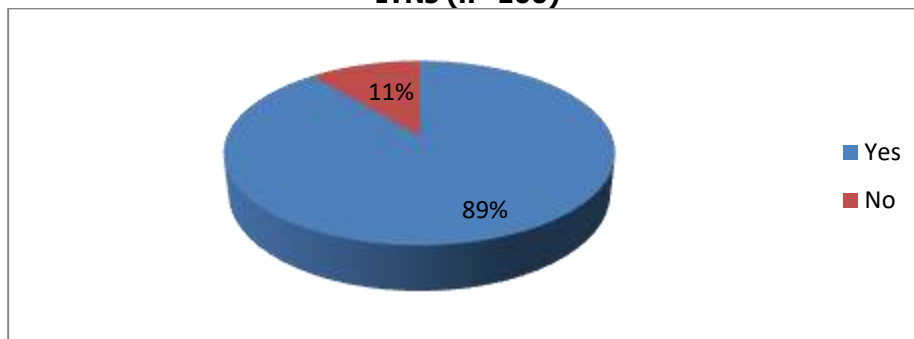
Figure 3: Shows the distribution of respondents according to what they say is the importance of ITNs



From Figure 3, a majority 67(67%) said ITNs prevent malaria,28(28%) mention that it cures malaria while only 5(5%) mention other reasons.

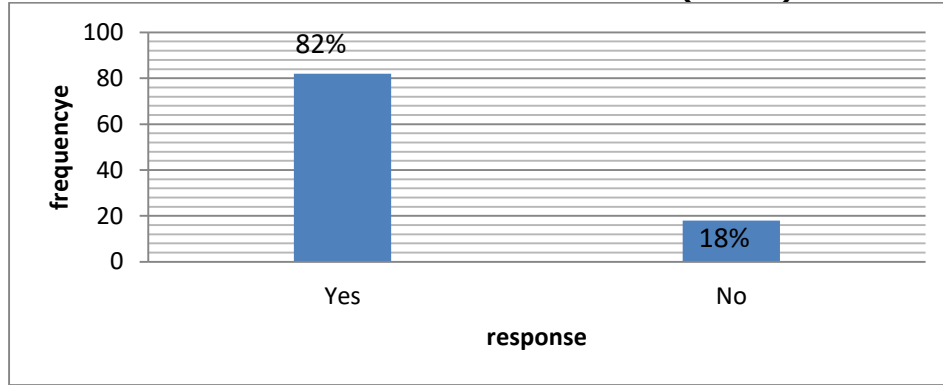
ATTITUDE TOWARDINSECTICIDE TREATED MOSQUITO NET UTILIZATION

Figure 4: Shows the distribution of respondents according to whether they are willing to use ITNs (n=100)



From Figure 4, a majority of 89(89%) of respondents were willing to use ITNs, and 11(11%) were not willing.

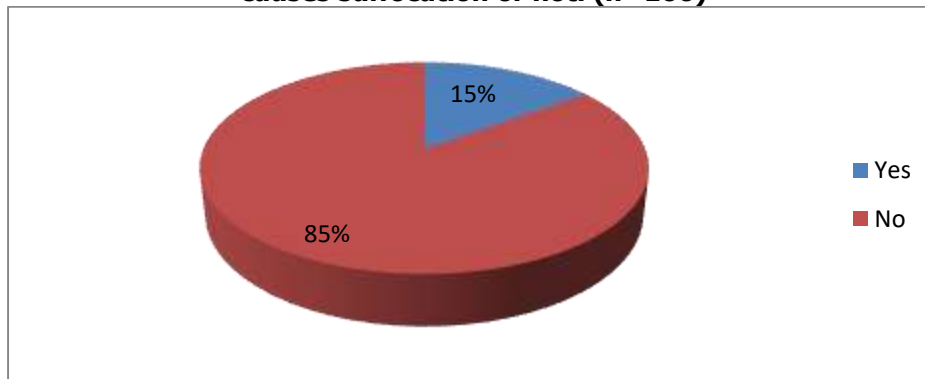
Figure 5: Shows the distribution of respondents according to whether they would recommend others to use ITNs or not (n=100)



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From Figure 5, a majority of 82(82%) were willing to recommend others to use ITNs, while only 18(18%) were not willing to recommend others.

Figure 6: Shows the distribution of the respondents according to whether sleeping under ITN causes suffocation or not. (n=100)



From Figure 6, a majority of 85(85%) said that sleeping under ITNs does not cause suffocation, and 15(15%) said that it causes suffocation.

SOCIAL DEMOGRAPHIC FACTORS AFFECTING THE UTILIZATION OF ITNs

Table 2: Shows the effects of marital status on the utilization of ITNs. (n=100)

| Marital status on ITN utilization | Frequency | Percentage(%) |
|-----------------------------------|-----------|---------------|
| Married | 92 | 92% |
| Unmarried | 8 | 8% |
| TOTAL | 100 | 100% |

From Table 2, the majority 92(92%) of the married women were sleeping under ITNs, while only 8(8%) unmarried women were sleeping under ITNs.

Table 3: Shows the effects of the level of patient's income on the utilization of ITNs (n=95)

| Source of monthly income | Frequency | Percentage |
|--------------------------|-----------|------------|
| High | 65 | 74% |
| Low | 25 | 26% |
| TOTAL | 95 | 100% |

From Table 3, the majority of the individuals 65(74%) had a high source of income and were sleeping under ITNs while 25(26%) of the low-income earners were sleeping under ITNs.

Table 4: Shows the effects of the age of the mother on the utilization of ITNs (n=100)

| Age of mothers | Frequency | Percentage |
|--------------------|-----------|------------|
| 15-30 years | 72 | 72% |
| 31 years and above | 28 | 28% |
| TOTAL | 100 | 100% |

From Table 4, the majority of the mothers aged between 15 – 30 Years, 72(72%) were sleeping under ITNs, and aged 31 years and above, only 28(28%) were sleeping under ITNs.

Discussion

Knowledge about the utilization of insecticide-treated nets

The majority 92(92%) of respondents knew about ITNs and, this is because the majority of the mothers had got information about ITNs from different places such as hospitals, social media, village health teams (VHTs) among others, this study goes line with a study conducted by (Okafor & Ogbonnaya, 2020) in a selected hospital in South-Eastern Nigeria, on Knowledge, accessibility, and utilization of insecticide-treated nets among pregnant women which showed that All the respondents 100% knew about ITNs.

Further this study also goes in line with a study conducted by (San et al 2021). in Malaysia, and Myanmar which showed that Out of 256 respondents studied, 166 (64.8%) had heard about ITNs. Also, the majority 58(58%) of respondents heard about ITNs from ANC, and 16(16%) heard from the radio, this indicates that the majority of respondents had got the information about ITNs during ANC visits.

This study however also goes in line with a study conducted In a Hohoe municipality in Ghana by Binka *et al*, (2017), which showed that 33.6% of mothers heard from the ANC clinic and (3.8%) from the radio. A majority 67(67%) said ITNs prevent malaria, and 5(5%) mentioned other reasons, this indicates that most of the mothers had good knowledge about ITNs.

Furthermore, this study goes in line with a study conducted (mucosa, 2020)in Nigeria showed that (47%) of the

respondents knew that ITN prevents malaria, this still agrees with a study conducted in Malaysia, and Myanmar by (San et al 2021) on Knowledge which showed that about 70% (n=168) of the respondents could correctly answer that Malaria could be prevented by sleeping inside bed net and only.

Attitude toward insecticide-treated mosquito net utilization

From the results, a majority 89(89%) of respondents were willing to use ITNs, and a majority 82(82%) were willing to recommend others to use ITNs, this results showed that mothers had a good attitude towards ITNs, this could be because they were health educated about the benefits of sleeping under ITNs and the majority had not fallen sick from malaria for a long time, hence making them comfortable to use ITNs for malaria prevention, this study, however, goes in line with a study by study conducted by in Awka, Nigeria which showed the good attitude of the respondents towards ITNs where a majority (98.3%) of the respondents considered ITNs to be useful, also majority (81.3%) of the respondents were willing to buy ITN.

This still goes in line with a study conducted by Mubi North local government area in Adamawa state, Nigeria by(Ephraim *et al*, 2021) on the use of insecticide-treated nets revealed that (91.1%) of the respondents agreed that consistent use of ITNs in the best preventive measure for malaria, (88.5%) of them believed that it's important and beneficial to sleep under an ITN every night, Also a majority 85(85%) said that sleeping under ITNs does not cause suffocation, 15(15%) said that it causes suffocation. Furthermore, it's in line with a study conducted by (Nuuyoma *et al*, 2019) in Kavango East, Namibia On Knowledge, Attitudes, and practices of the university

students on Malaria prevention which showed that 70.7%) of respondents disagreed with this statement and only 1 respondent gave a neutral response to this statement.

Social demographic factors affecting the utilization of ITNs

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The majority of the married (90%) were sleeping under ITNs, this could be because the majority of married women had received free ITNs from the health facility during the antenatal visits, and they were recommended sleep under ITNs by health workers to prevent malaria, this goes in line with a study conducted by (Azeb *et al*, 2018) in Addis Zemen Hospital, North-Western Ethiopia which indicated that (95.6%) of married women utilized ITNs, the remaining percentage 4.4% did not utilize.

Furthermore, this study also indicated that the majority of the married women had utilized ITNs at the place of study, this study still agrees with a study conducted by (Edward *et al*, 2020), in Nigeria which showed that (88.5%) of married women utilized ITNs, Also a majority 54(79%) of the individuals earning high income were sleeping under ITNs, this is because high-income earners had money to buy ITNs.

This study also goes in line with a study conducted in northern Ghana by (Edmund *et al*, 2019) which showed that (74%) of respondents who had improved status of living were more likely to own ITNs, 26% of people in this category of improved standards of living were less likely to utilize ITNs.

Conclusions

The study observed that the majority of the pregnant women were fully aware of insecticide-treated mosquito nets and were willing to receive and even recommend them to their friends. In addition, it was also observed that the majority of the pregnant women believed that ITNs are 100% effective in offering protection against malaria. It was also observed that the pregnant woman's age played a role in the utilization of ITNs where pregnant women of 15-30 years and women 31 years and above reportedly had a low utilization of ITNs compared to other age groups. In addition, it was also observed that some of the pregnant women were not allowed by their tribes, religion, and marriage partners to use ITNs.

Recommendations

Health workers and VHTs should encourage mothers to go to their nearest health facilities for antenatal visits and health education.

The government should provide free ITNs to pregnant mothers to increase the utilization of ITNs.

Health workers should health educate the mothers about the benefits of sleeping under ITNs to improve their attitude.

Encouraging male partners to get involved and support the use of ITNs.

Study limitations

The time for data collection was limited to less period during the holiday a researcher will have which will lead to inadequate time for the study. There will be a lack of a universal standard scoring system to define adequate or inadequate knowledge and practice

Acknowledgment

With great pleasure, I would like to express my sincere gratitude to the following people and institutions without whose efforts, this research would not have been a success. First, I thank the Almighty GOD for His generous love, mercy, and guidance bestowed upon me throughout my academic life.

Still, I thank the Almighty God for his gracious help and wisdom, for without his grace and wisdom, I wouldn't have accomplished my goal.

I greatly thank my supervisor MRS. NEGESA JUSTINE for the continuous guidance, counseling, advice, and support that he has given me throughout reporting the different difficulties faced. May the almighty God bless you.

I continue to acknowledge the support of my classmates and I am greatly thankful to the study participants and research assistants who took part in this study. My sincere gratitude also goes to my parents; may the Almighty God bless you abundantly for your financial support towards my academics.

Abbreviations and Acronyms

| | |
|--------|--|
| ITNS: | Insecticide Treated Mosquito Nets |
| LLINS: | Long Lasting Insecticide Mosquito Nets |
| MOH: | Ministry of Health |
| NGOs: | Non-Governmental Organizations |
| WHO: | World Health Organization |

Source of funding

No source of funding.

Conflict of interest

No conflict of interest.

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