

Knowledge, attitudes and practices towards prevention of malaria among pregnant women attending ANC services at Busolwe hospital in Butaleja district. A cross-sectional study.

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Abstract

Background: Malaria in pregnancy is a serious health risk with many side effects for both the mothers and the unborn babies, and its high level of transmission is highly attributed to inconsistencies in prevention methods like use of ITNs, indoor residual spraying, IPT and many others. This study aimed at determining the knowledge, attitude and practices towards prevention of malaria among pregnant women attending ANC services at Busolwe Hospital in Butaleja.

Methodology: A cross-sectional descriptive study was carried out on 79 pregnant women who were selected using a simple random sampling method. Data was collected using questionnaires and analysed using Microsoft Word and Excel, and results were presented as tables, pie charts and bar graphs.

Results: Majority of the respondents were aged between 26-35 years 43%, married 85% and had attained secondary education. All the respondents had heard about malaria in pregnancy, and 89% of them knew that malaria is transmitted through mosquito bites. 24% of the respondents believed that malaria was a serious health risk during pregnancy. 76% believed that ITNs were effective in the prevention of malaria. However, 48% slept under ITNs, and 8% regularly took anti-malarial drugs during their pregnancy.

Conclusion: Pregnant women had good knowledge about malaria in pregnancy, with varied attitudes towards its prevention. However, practices were unsatisfactory.

Recommendations: Local leaders, with help from the Ministry of Health, through health training programs and monitoring, should continue to sensitise pregnant mothers on the importance of practising malaria preventive methods, especially taking antimalarials and using ITNs.

Keywords: Knowledge, attitude and practice, artemisinin derivatives, Busolwe hospital, Butaleja district, Insecticide-treated nets.

Background

Malaria is a life-threatening condition caused by parasites that are transferred to people by bites of infected female anopheles mosquitoes (Goshu, 2019). It is also defined as an acute febrile illness caused by infection with Plasmodium parasites and is transmitted from person to person by an infected female Anopheles mosquito (UCG, 2020). There are five Plasmodium species of malaria parasites which infect humans, namely: *P. falciparum*, *P. vivax*, *P. ovale*, *P. malariae*, and *P. knowlesi*. (UCG 2020). *P. falciparum* is the most virulent and also the most common malaria parasite in Uganda. (UCG, 2020). Malaria is noted to be more geographically distributed in regions with warm climates and high levels of mosquito activity (Siagian et-al 2020). Malaria is one of the deadliest infectious diseases, with an estimated 229 million cases and 409000 deaths worldwide by 2019 (Imboumy-Limoukourk, Nzondo et-al 2020).

Globally, malaria has been regarded as a long-standing health problem contributing to high mortality and death rates among pregnant women and children (Taremwa, Ashaba, et-al 2017). In 2019, there were an estimated 229 million cases of malaria worldwide, 11 million of which were among pregnant women in sub-Saharan Africa who delivered about 872000 children with low birth weight, with West Africa having the highest prevalence of low-birth-weight children due to malaria in pregnancy (WHO 2020).

In Africa, pregnant women account for a disproportionate burden of malaria cases and deaths (RBM 2019). Malaria during pregnancy is a leading cause of morbidity among pregnant women in Africa, particularly in rural areas with limited access to healthcare (RBM 2019).

Sub-Saharan Africa bears the highest burden of malaria among pregnant women, with 90% of global cases occurring in this region (WHO, 2020). Pregnant women in sub-Saharan Africa face significant barriers to accessing preventive measures and healthcare services, exacerbating the risk of malaria (RBM 2019).

Malaria continues to be a serious public health problem affecting pregnant women in sub-Saharan Africa despite the significant efforts put in by the Cameroon government to eradicate it (Talipouo, Ngadjell, et-al 2019)

East Africa is a high-burden region for malaria among pregnant women, with Uganda, Kenya and Tanzania accounting for 60% of regional cases (WHO 2020). Pregnant women in East Africa face significant challenges in accessing healthcare services and preventive measures, particularly in rural areas (RBM, 2019).

In Uganda, the FY 2017/2018 report indicated that there were 228371 outpatient department malaria in pregnancy cases, down from 2904949 in FY 2016/2017; the inpatient department malaria in pregnancy cases reduced from 88960 cases in FY 2016/2017 to 2017/2018 (MOH 2019). According to the Uganda Bureau of Statistics (2020), Butaleja district has one of the highest malaria prevalence rates in the country, with 45.6% of pregnant women testing positive for malaria. Therefore, results from this study would be used to reduce the rate of transmission of the disease. This study aimed at determining the knowledge, attitude and practices towards prevention of malaria among pregnant women attending ANC services at Busolwe Hospital in Butaleja.

Methodology

Study design

A cross-sectional study design was used for the study.

Study area

The study was conducted at Busolwe hospital, which is located at a latitude of 0.849449 and a longitude of 33.929156, approximately 12km away from the district headquarters in the Eastern region, approximately 235.1 km away from Kampala. Busolwe Hospital was the area of interest due to the increased cases of malaria in the area.

Study population

The target population consisted of pregnant women attending ANC services at Busolwe Hospital, Butaleja District.

Sample size determination

The sample size was determined using Kish and Leslie. $n = \frac{z^2 PQ}{e^2}$

Where n = desired sample size, z = standard deviation at confidence interval of 95%, taken as 1.96.

p = the prevalence of pregnant women with malaria (0.5%) (Okiring et-al, 2015), d = degree of accuracy (0.05).

q = population without the desired characteristics (1-p).

$n = (1.96)(1.96) \times 0.5(1-0.5) / (0.05)(0.05)$

n = 384

Since the total population of participants involved was less than 10,000 (100), the following formula was applied;

$$nf = \frac{n}{1 + \frac{n}{N}}$$

Sample size determination (nf) was calculated as follows, Mugenda formula;

nf = the desired sample size (when the population is less than 10,000),

n = the desired sample size (when the population is more than 10,000)

N = the estimated population size

$nf = \frac{384}{1 + \frac{384}{100}}$, N = 100 (estimated number of pregnant women in Busolwe hospital)

Sampling techniques

Simple random sampling was used to obtain the study participants because of the large study population, which would require much time to study every individual.

Sampling procedure

A simple random sampling method was used to select the required respondents. The participants were identified. These were pregnant women in Busolwe hospital. Then equally sized papers were made and labelled "YES" and the others "NO". The papers were folded uniformly and put in a box, and mixed thoroughly. The respondents were invited, one by one, to pick a paper. Those who chose "YES" were included in the study.

Data collection method

Data was collected using a survey method, which involved the use of questionnaires.

Data collection tools

The data collection tools used were self-administered questionnaires, which had questions and alternative answers which were to be circled by respondents or assisted by me to circle those who could not read and write. They consisted of closed-ended questions designed to analyse the four aspects: demographic characteristics, knowledge, attitude, and practices of pregnant women.

Data collection procedure

A letter of introduction was obtained from the research committee of the International Paramedical Institute (IPI), which was presented to the Medical Superintendent of Busolwe hospital seeking permission to carry out the study in the area. With an authorisation letter granted, the assistant then proceeded to the participants, where they introduced themselves, consented, explained the objectives of the study and then gave out questionnaires to the pregnant women who agreed to take part in the study. The questionnaires were answered by circling the best alternative as given by the participant. The

questions were translated into the local language (Lunyole) and also included the alternative choice for the participants who were illiterate to answer the questionnaire. This helped to go on with the data collection process without contradiction due to the English language used in the questionnaire.

Independent variable

Knowledge, attitude and practices related to malaria prevention among pregnant women

Dependent variable

Prevention of malaria among pregnant women.

Quality control

Pretesting of the research tool

A pilot study was conducted on pregnant women attending ANC at Muhuyu Health Centre 2 in Butaleja district to assess the feasibility of the study. A sample of ten pregnant women was examined to determine the extent to which the questions would address the study objectives; however, these were not included in the study.

Training of the research assistant

The research assistant was trained on how the participants would be approached, which included obtaining consent, explaining the objectives of the study, handing the questionnaires for answering and assisting in translation where participants didn't understand.

Giving ample time for data collection

Collection of data from each respondent would take about 15 minutes while filling out the questionnaire.

Inclusion criteria

Pregnant women attending ANC at Busolwe Hospital in Butaleja who consented

Exclusion criteria

Participants who were ill were excluded

Data analysis and presentation

The data from the questionnaires was first analysed manually by tallying using paper and pen. Data was then entered into Microsoft Excel for analysis and presented in the form of percentages and frequencies in tables, graphs and pie charts.

Ethical consideration

A letter of introduction was obtained from the research committee of the International Paramedical Institute (IPI), introducing the investigator to the medical superintendent of Busolwe hospital, seeking permission to carry out the study in the area.

After permission was granted, the collection of data commenced, where consent was sought, and the objectives of the study were well explained to participants who agreed to be involved in the study.

No money or gift was promised to any participant for participation.

Participants were assured of full privacy and confidentiality, where their names were not included anywhere on the questionnaires.

Results

Socio-demographic data of the respondents.

Table 1: Socio-demographic characteristics of respondents (n=79).

Variables	Response	Frequency (n=79)	Percentage
Age	Under 18years	11	14%
	18-25years	20	25%
	26-35years	34	43%
	Over 35years	14	18%
Education level	No formal education	5	6%
	Primary	26	33%
	Secondary	39	49%
	Tertiary	9	11%
Employment status	Unemployed	30	38%
	Self employed	29	37%
	Employed	20	25%
Marital status	Single	5	6%
	Married	67	85%
	Divorced	7	9%
	Widowed	0	0%
Gestational age	Below 20 weeks	39	49%
	25-33 weeks	25	32%
	34-42 weeks	15	19%

Findings from table 1 show that the majority of the pregnant women were aged between 26- 35 years (34, 43%), and those over 35years were the minority. 39 of the respondents (49%) had attained secondary education, followed by 26(33%) who had attained primary education, then 9(11%) had attained tertiary education, and 5(6%) of them had not attained any formal education. Regarding employment, 30(38%) of the respondents were employed, followed by 29(37%) who were self-employed, and 20(25%) were unemployed. Most of the respondents were married, 67(85%), followed by those who were divorced, 7(9%), then those who were single, 5(6%), and no one was widowed. Regarding gestational age, most of the respondents were below 20 weeks of gestation, 39(49%), followed by those who were between 25-33 weeks of gestation, 25(32%), and 15(19%) were between 34- 42 weeks of gestation. Knowledge towards the prevention of malaria among pregnant women

Knowledge towards the prevention of malaria among pregnant women.

Table 2: Showing the knowledge towards the prevention of malaria among pregnant women. n=79

Questions	Responses	Frequency	Percentage
Have you heard about malaria?	Yes	79	100%
	No	00	0%
Common symptoms of malaria include	Fever	00	0%
	Chill	00	0%
	Headache	19	24%
	Skin rash	60	76%
Methods of malaria prevention are known	Use of ITNs	00	0%
	In door residual spraying	07	9%
	Vaccination	72	91%
	Eliminating stagnant water	00	0%

Findings from Table 2 show that all the respondents 79 acknowledged they had heard about malaria. The majority of the respondents (76%) knew that fever, chills, headache, except skin rash, were the common symptoms of malaria, except a few of them (24%) who did not know that headache could also suggest malaria. Most of the respondents knew that malaria is transmitted through mosquito bites, 70(89%), and not through contaminated water and food, though one of them had it in mind that it could be airborne. Of the 79 respondents (91%) knew the methods of preventing malaria in pregnancy, which were the use of ITNs, indoor spraying and eliminating stagnant water, apart from the minority (9%) who didn't know that indoor residual spraying was also a preventive method of malaria.

Figure 1: Showing the mothers' knowledge about malaria transmission.

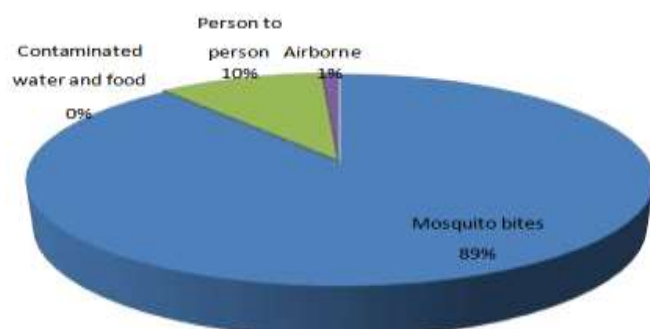


Figure 1 shows that of 79 respondents, the majority (89%) acknowledged that malaria is transmitted through mosquito bites, 10% acknowledged that it is transmitted through person-to-person contact, 1% acknowledged that it is airborne, and none of them said it is transmitted through eating contaminated food and water.

Attitude towards the prevention of malaria among pregnant women

Table 3: Showing attitude towards the prevention of malaria among pregnant women, n=79.

Variables	Response	Frequency	Percentage
Belief that malaria is a serious health risk during pregnancy	Strongly Agree	04	5%
	Agree	15	19%
	Neutral	60	76%
	Disagree	00	0%
Effectiveness of using insecticide-treated nets in preventing malaria	Strongly Agree	10	13%
	Agree	50	63%
	Neutral	12	15%
	Disagree	07	9%

Findings from Table 3 show that the majority of the respondents, 60(76%), didn't know whether malaria was a serious health risk during pregnancy or not, and therefore, they neither agreed that it was serious nor disagreed. 15 (19%) of the respondents agreed that malaria was a serious health risk in pregnancy, and 4(5%) strongly agreed that it was a serious health risk, but none disagreed that it was a serious health risk. 50(63%) respondents agreed that insecticide-treated nets were effective in the prevention of malaria during pregnancy, 12 (15%) of them never agreed or disagreed on the effectiveness of insecticide-treated nets, and 10 (13%) strongly agreed that they were effective, while 7 (9%) disagreed on their effectiveness. Furthermore, 46(58%) of the respondents didn't know whether it was important or not to take antimalarial medications during pregnancy, and 28(35%) knew that it was important, followed by 4(5%) who saw it as very important to take them, and only one person thought it was not important to take antimalarial drugs during pregnancy.

Figure 2: Showing the level of confidence of pregnant women in their ability to prevent Malaria. n=79.

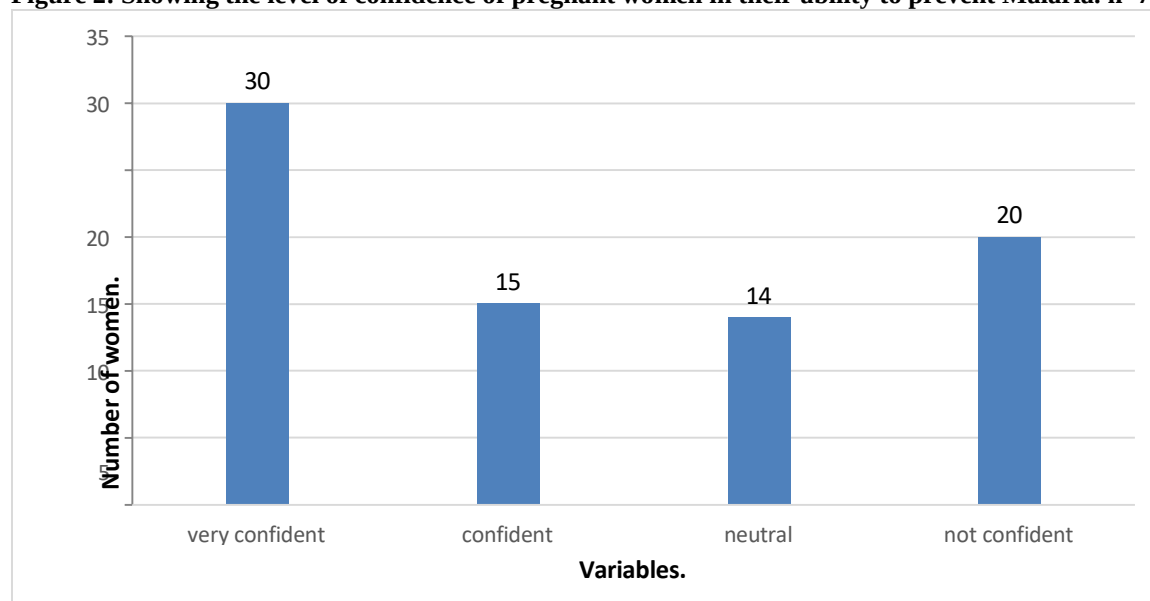


Figure 2 showed that 30 (38%) of the respondents were very confident in their ability to take preventive measures against malaria in pregnancy, followed by 20(25%) of them who were not confident. 15 (19%) were confident and 14(18%) were neither confident nor not confident.

Figure 3: Showing the percentage perception of antimalarial treatment among pregnant women, n=79.

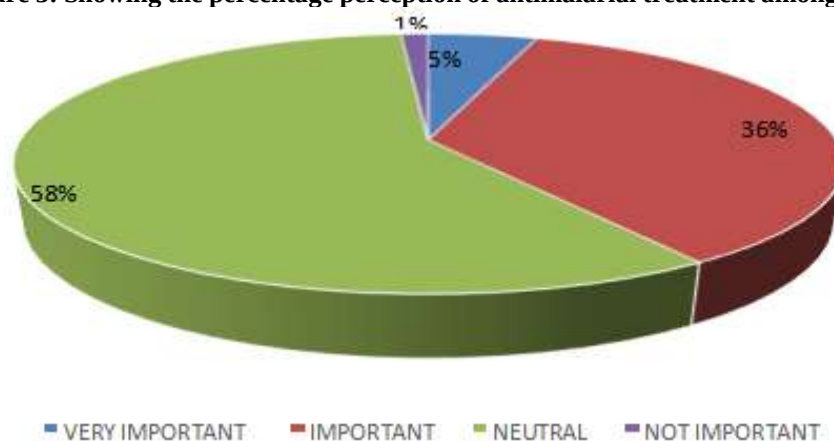


Figure 3 shows that the biggest number of respondents 58% never agreed or disagreed that it was important or not to take antimalarial drugs during pregnancy, therefore could not choose a side, and the least number said it was not important (1%).

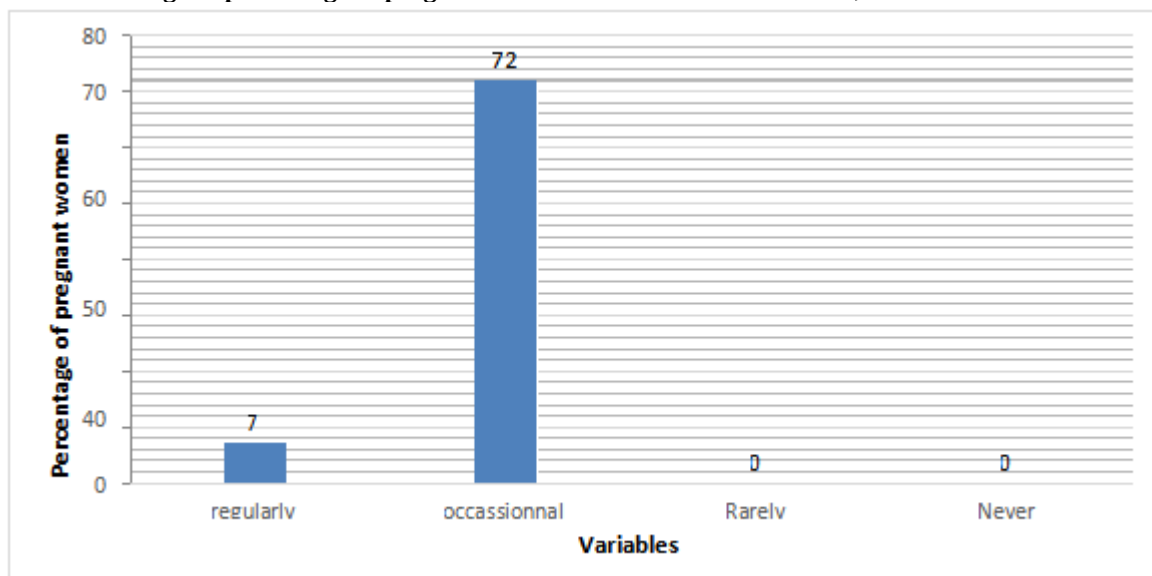
Practices towards the prevention of malaria among pregnant women.

Table 4: Showing practice towards the prevention of malaria among pregnant women. n=79

Variables	Responses	Frequency	Percentage
Mothers who sleep under insecticide-treated nets?	Always	38	48%
	Sometimes	29	37%
	Rarely	3	4%
	Never	9	11%
Pregnant women who received any information or education about malaria prevention during their pregnancy?	Yes	79	100%
	No	00	0%
Have you used indoor spraying in your home?	Yes	69	87%
	No	10	13%
How often do mothers visit a health care provider during pregnancy	Regularly (monthly or more)	9	11%
	Occasionally (every few months)	60	76%
	Rarely (only when necessary)	10	13%
	Never	00	00%
Adequate access to health care services for malaria prevention?	Yes	75	95%
	No	4	5%

Findings from Table 4 show that almost half of the respondents always slept under insecticide-treated nets (48%), and a minority (4%) of them rarely used ITNs. All the participants acknowledged that they had received information about malaria prevention during their pregnancy.

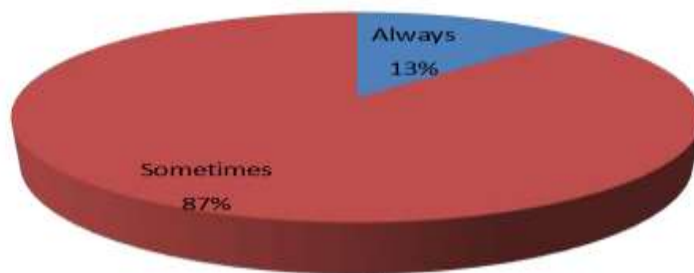
Figure 3: Showing the percentage of pregnant mothers who take antimalarials, n=79.



Only 7 (8%) of the respondents regularly took antimalarial medication, and the remaining 72(91%) took them occasionally. Most of the respondents, 69(87%), had used indoor spraying in their homes, and 10(13%) had not used it in their homes. Most of the respondents, 60(76%), visited a health care provider during their pregnancy, and only 9(11%) visited a health care provider regularly.

Almost all the respondents acknowledged that they had adequate access to health care services for malaria services 75(95%), apart from a few who said they had inadequate access to health care 4 (5%).

Figure 4: Showing the percentage of pregnant women who drain stagnant water around their homes, n=79.



From figure 4, the majority of the respondents drain stagnant water from their home compounds not so often, but they do it sometimes (87%), and the remaining 13% of them always drain stagnant water from their compounds.

Discussion

Knowledge towards the prevention of malaria among pregnant women.

The findings from the study show that the majority of all the respondents (100%) reported having heard of malaria. This indicates that most of them knew what malaria was. This could be through health education, friends or newspapers. This disagrees with a study by Adebayo (2015), where results showed that pregnant women knew less about malaria.

In terms of transmission, the overwhelming majority of respondents (89%) correctly identified mosquito bites as the primary mode of transmission. This indicates that they had adequate knowledge about the cause of malaria, and therefore, more emphasis should be put on the other aspects of malaria prevention. This was in agreement with a study by Esse et al. (2018). However, it is concerning that a small percentage of respondents believed that malaria could be transmitted through person-to-person contact (10%) and through air (1%), indicating a potential misunderstanding that warrants further education and awareness campaigns.

The study also assessed knowledge of malaria symptoms, with fever, chills and headache being the most commonly recognised symptoms among respondents, as indicated by this high percentage of (76%). This indicates that most of the respondents could recognise malaria infection, implying that they had been sensitised before. These findings are contrary to the previous research by Agyemang et al. (2018) in a study with the title knowledge, attitude and practices regarding malaria prevention among pregnant women in Ghana where results showed that only 40% of the pregnant women in Ghana could correctly identify fever and chills as symptoms of malaria.

Regarding prevention, the majority of the respondents (91%) believed that malaria can be prevented and correctly identified the preventive methods being used of ITNs, indoor residual spraying and eliminating stagnant water, disregarding vaccination as a preventive measure. This means that respondents were well informed about malaria prevention methods, which is a crucial step towards preventing the disease. This was contrary to the study by Adebayo (2015), where results showed that caregivers had poor knowledge and utilisation of preventive measures.

Attitude towards the prevention of malaria among pregnant women.

This study revealed that (76%) of the respondents did not know whether malaria was a serious health risk during pregnancy or not. This is probably because they attributed complications of malaria in pregnancy to other causes, like witchcraft and curses, and only a few of the respondents believed that it was a serious health risk, with 24% agreeing that it was serious. This is contrary to a study by Fuge et al. (2020) where results showed that more than half of the pregnant women's population showed a positive attitude towards the severity of malaria and its prevention methods.

A total of 76% of the respondents agreed on the effectiveness of ITNs in preventing malaria. This is probably because the majority of the pregnant women attended health education sessions about malaria in pregnancy and its control during ANC visits, hence, they would promote malaria prevention in pregnancy. This is in line with a study by Nwachukwu et al (2014), where results showed that 70% of pregnant women in Nigeria believed that ITNs were effective in preventing malaria. The majority of the respondents (58%) neither agreed nor disagreed on the importance of IPT during pregnancy. This would be due to the contradiction between the information they receive from health workers and cultural beliefs, plus myths that exist about the use of IPT in the treatment of malaria in pregnancy. However, a total of percentage of 32% agreed on the importance of IPT use in pregnancy. This is contrary to a study by Mmbando et al (2016), where results showed that a higher percentage of 85% of pregnant women believed in the effectiveness of IPT in preventing malaria. 1% of the respondents disagreed on the effectiveness of IPT in the prevention of malaria. These results warrant the need for more health education about the use of IPT to correct people's attitudes towards it.

A total percentage of 57% of the respondents felt confident in their ability to take the necessary steps to prevent malaria, with 25% of them not feeling confident and 18% not being sure whether they could or not. This is in line with a study by Ochola et al (2015), where results showed that only 50% of the pregnant women felt confident in their ability to take necessary steps to prevent malaria. These findings suggest that while some pregnant women feel confident in their ability

to take necessary steps to prevent malaria, others may need additional support and education to feel empowered to take action.

Practices towards the prevention of malaria among pregnant women.

Sleeping under insecticide-treated nets (ITNs) emerged as the most commonly adopted preventive measure, with percentages of 48% always using them, and 37% sometimes using them, and 11% of the respondents did not use ITNs. This implies that the government has played its role in supplying ITNs and also shows that the previous sensitisations about their use were effective. This disagrees to a study by Agarwal et al (2018) titled “Malaria prevention practices among pregnant women” in India that revealed that 40% of the pregnant women globally did not use ITNs which was a higher percentage indicating a bigger gap in usage of ITNs than what was found out during this study basing on reports from pregnant women in Busolwe hospital, followed by taking antimalarial medications as prescribed. This would be due to the information that they all acknowledged that they had received about malaria and its prevention. However, there was a low regular uptake of IPT (8%), and most pregnant women took them occasionally, meaning they didn’t complete the recommended doses. This is in line with a study by Gari et al. (2018) in Ethiopia, which found that only 36.4% of pregnant women received IPTp2. All the respondents, 79, acknowledged that they eliminated stagnant water around their homes, though the biggest percentage did not do it regularly (87%), meaning there were still higher chances of allowing mosquitoes to breed before eliminating such waters. This is contrary to a study by Nwachukwu et al (2014) in Nigeria, where results showed that the highest percentage (80%) eliminated stagnant water.

87% of the respondents acknowledged that they had used indoor residual spraying in their homes, though many of them had myths and misconceptions about it, and only accepted to use it because it was a government program. This means there is still a need to assure these mothers about the effectiveness of this method so that they implement it willingly. This was in line with a study by Traore et al (2018) in Mali, where results showed that 70% of pregnant women reported using indoor residual spraying.

Only 11% of the respondents regularly visited a health care provider during their pregnancy. This was probably due to a persistent high rate of herbal use in the treatment of illnesses in pregnancy or self-diagnosis and treatment from their homes, which is risky to both the mother and fetus in case malaria complicates. This is contrary to a study by Dassi et al (2018), where results showed that 75% of pregnant women attended antenatal care (ANC) visits. However, 76% of them visited but occasionally, and 13% rarely visited, probably due to a poor attitude towards medical treatment of malaria.

Conclusion

The study established that the knowledge of pregnant women was sufficient since most of them had heard about it and knew that it is transmitted through mosquito bites, knew almost all the symptoms of malaria, and its prevention methods. The attitudes were relatively sufficient since most of them agreed that use of ITNs is an effective way to prevent malaria, and almost half of the respondents agreed on the use of IPT during pregnancy to prevent malaria. However, the prevention practices were lacking. This was reflected in inconsistencies in taking antimalarial drugs during pregnancy and failure to use ITNs.

Recommendation

The government, through the Ministry of Health, should put up health programs on the media which sensitise the public about the prevention of malaria in pregnancy.

Local leaders should put in place a committee to monitor the practices of malaria prevention in pregnancy and set up regular training programs with an aim of better implementation of preventive practices among pregnant women.

Administration of Busolwe should encourage health workers to carry out health education about different infections like malaria to encourage people to implement proper preventive methods, as well as to access health facilities early in case they experience symptoms of the disease.

Pregnant women should put into practice the good knowledge they have about the preventive methods of malaria by implementing them.

Acknowledgement

I extend my gratitude to Almighty God for the gift of life and all the provisions, for I couldn’t have walked this journey without His mercy.

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May God grant you healthy lives and the wishes of your prayers

List of abbreviations

UCG: Uganda Clinical Guidelines

WHO: World Health Organisation

ITNs: Insecticide-Treated Mosquito Nets

SDGs: Sustainable Development Goals

KAP: Knowledge, Attitude and Practices

IPT-SP: Intermittent Preventive Therapy-Sulphadoxine Pyrimethamine

Source of funding

The study was not funded.

Conflict of interest

The author declares that there was no conflict of interest.

Author contributions

EW- Developed and investigated the study.

JK- Supervised the study.

MMM- Supervised the study.

Data availability

Data is available upon request.

Informed consent

Written informed consent was obtained from all participants prior to their inclusion in the study. Participants were informed about the purpose of the study, procedures involved, potential risks and benefits, and their right to withdraw at any time without penalty.

Author biography

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