KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY,

KUMASI, GHANA

COLLEGE OF HEALTH SCIENCES

SCHOOL OF PUBLIC HEALTH

KNOWLEDGE, AVAILABILITY AND UTILIZATION OF LONG LASTING INSECTICIDE TREATED BED NET AMONG PREGNANT WOMEN IN KANESHIE POLYCLINIC- OKAIKOI SOUTH SUB METROPOLITAN IN GREATER, ACCRA REGION

BY

ESTHER BOATEMAA

SEPTEMBER, 2019

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A THESIS SUBMITTED TO THE SCHOOL OF PUBLIC HEALTH, COLLEGE OF HEALTH SCIENCES, IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF A BACHELOR DEGREE IN PUBLIC HEALTH

SEPTEMBER, 2019

DECLARATION

I hereby do declare that except for references to other people's work which have been duly acknowledged, this piece of work is my own composition and neither in whole nor in part has this work been presented for the award of a degree in this university or elsewhere.

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ABSTRACT

Background: Malaria is a disease which is caused by the plasmodium parasites in the blood or tissues of humans. In 2012, government of Ghana distributed bednets to pregnant women in order to reduce the transmission of malaria. Though there was a massive distribution all over the country, the consistent use of the Long Lasting Insecticide treated Net (LLIN) is low. Thus this study was done to find out the use of LLIN among pregnant women in the Kaneshie Polyclinic and find out knowledge of the pregnant women on malaria prevention.

Method: A facility based cross-sectional study involving 227 pregnant was carried out at Kaneshie Polyclinic in April to August 2019. 277 respondents were sampled using purposive sampling from among those who attend Ante-Natal clinic in Kaneshie Polyclinic. Data was collected using a questionnaire designed in Open Data Kit (ODK) and analysed using excel. The data was presented in frequency table.

Results: A total of 227 respondents were involved in the study. The mean age of the respondents was 35 years. The majority of pregnant women (91.19%) (204) who attended ANC at Kaneshie Polyclinic had knowledge about transmission of malaria. Most of them (78.18%) had very good knowledge about LLIN use and that was significant. Some of the participants [38.33% (87)] had misconceptions about the use of LLIN. Despite their high level of knowledge about malaria transmission and use of LLIN, the level of usage of LLIN among the pregnant was low 68.28%. Majority of the respondents were of the view that they use the net because malaria will not kill them and their unborn child will be safe.

Conclusion: In conclusion, accessibility off LLIN is very high yet unitization was very low

DEDICATION

This thesis is dedicated to my Brother Kweku Aseidu for his support during this work.

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Ante-Natal clinic for their support and cooperation during the collection of data.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF ABBREVIATIONS

ANC	Antenatal Clinic

DDT	Dichlorodiphenyl - trichloroethane DHMT
	District Health Management Team
GARHD	Greater Accra Regional Health Directorate
GDHS	Ghana Demographic Health Survey
GHS	Ghana Health Services
IPT	Intermittent Preventive Treatment
IRS	Indoor Residual Spray
ITN	Insecticide Treated Nets.
LLIN	Long Lasting Insecticide Treated Nets
MDG	Millennium Development Goal
NGO	Nongovernmental Organization
NMCP	National Malaria Control Programme
ODK	Open Data Kit
OPD	Out Patient Department
RBM	Roll Back Malaria
UNICEF	United Nations International Children Emergency Fund

DEFINITION OF TERMS

Antenatal care Medical surveillance and review performed during pregnancy for the early detection of possible complications of pregnancy

Perception: The constellation of mental processes by which a person recognizes, organizes and interprets intellectual, sensory and emotional data in a logical or meaningful fashion. **Utilization:**

Put to use

Usage: The process of using something

Knowledge: The understanding of or information about a subject that you get by experience or study, either known by one person or by people generally

CHAPTER ONE

INTRODUCTION

Background to the Study

Malaria is an infectious disease the word "Malaria" was derived from two Italian words, "mal" and "aria", meaning "bad air" because it was first thought that the disease came from fetid marshes (Reiter, 2000). In 1880, scientists discovered the real cause of malaria as a one-cell parasite from the genus *Plasmodium* (Reiter, 2000). It is a serious public health problem particularly in pregnant women in the tropics (Nwonwu *et al.*, 2009). *Plasmodium falciparum* is responsible for the majority of malaria infections that occur in pregnancy as compared to other species of the parasite (Omo-Aghoja *et al.*, 2008). *Plasmodium falciparum* malaria infection in pregnant women may have significant adverse consequences for both mother and child (McGregor, 1984). Malaria is more frequent in pregnant women than in age-matched controls, and in areas of low endemicity such as Southeast Asia, severe or complicated malaria may also occur (McGregor, 1984). There is evidence that severe malaria may also be a significant problem in pregnant women in urban areas in sub-Saharan Africa (Granja *et al.*, 1998).

Globally 3.3 billion people are at risk of malaria infection. Eighty percent of the 219 million malaria cases in 2010 and 90% of 660,000 malaria related deaths were from Africa. (Singh *et al.*, 1999). Current best practices for tackling malaria include: (1) prompt diagnosis (using light microscopy or rapid diagnostic tests) followed by treatment with effective medicines (such as artemisinin based combination therapy (ACTs), (2) vector control (including primarily the use of insecticide Long lasting insecticide treated Bed Nets (LLINs) and indoor house spraying with residual insecticides (IRS)) and (3) Intermittent Preventive Treatment (IPT) of pregnant women, infants or children. Lengeler, C. (2004)

Insecticide treated nets

One of the highly recommended strategies of "Roll Back Malaria" was the utilization of ITNs as personal protective devices or tools to kill or repel mosquitoes (WHO, 2002a). These nets were used in order to orchestrate a barrier between mosquitoes and humans especially the vulnerable There are two types of nets used: **(1)** Insecticide-treated nets (ITNs), which require re-treatment every 6 to 12 months and insecticide can be permethrin or deltamethrin. "Deltamethrin is effective for a year; thus, re-treatment is annual. Permethrin lasts for six months; thus, two treatments per year are assumed if the transmission season is longer than six months" (Jamison et al. 2006), **(2)** long-lasting insecticidal nets (LLINs) are also manufactured with insecticide Impregnated to last for three (3) years and requires no retreatment with twenty washing or within the three years period of usage (Guillet et al., 2001, Pg. 998).

Other Preventive Methods of Malaria

Vector control: Prevention and control mechanisms with respect to addressing the vector population largely depends on combining different methods such as the use of insecticide, repellents, environmental management by educating the population on the need for environmental and personal hygiene especially in keeping the immediate surrounding clean with proper drainage system, and above all instigating a change in behavior of the population at risk (Jamison *et al.*, 2006, Pg463).

Indoor residual Spraying of dwellings with insecticides: It involves applying lethal doses of insecticide for at least 6 months on the wall of buildings, thus, repelling the mosquito vector from entering houses, and eventually prevents transmission of malaria (Jamison *et al*., 2006, pg. 463). Amongst the widely used insecticides, are: organophosphates, carbonates, and pyrethroids, generally accepted because of their property of rapid degradation in the soil. Other types of

insecticide (Dichlorodiphenyl-trichloroethane, or DDT) belonging to the organochlorines group, have widely been rejected and banned in many developed nations given their persistence in the environment and adverse effects on the health of humans and wildlife, though some countries still rely on them (Robert, 2006). However, the consistent use of IRS would not be cost effective in the endemic areas where transmission is year round due to lack of affordability, acceptance and other political constrains. (Walker, K. (2000)

Home repellant: Involves the use of mosquito repellent which is generally composed of chemical substances, in order to prevent the bites of mosquitoes. These may include: toxic plant derivatives (pyrethroids), or the use of rudimentary methods of burning herd or plants to produce smoke, thus repelling mosquitoes (Jamison et al., 2006, pg. 463). Even though several methods have been used to repel mosquito, (Charlwood & Jolly,1984) in a study at Papua New Guinea showed that the use of ITNs produced more effective results with minimum health implications. Alpers, M. P. (2001)

Health Education and Counseling: Health Education involves the provision of knowledge acquired as information through various media while Health Counseling requires interaction between individual with the ability to acquire skills. Given the importance of this component, it was imperative that households should acquire information on ways to prevent malaria especially for populations in endemic communities. In which case, these should include the importance of the population to seek prompt treatment at accessible health facilities with support and in full compliance with the overall health system Haas, J. P., & Larson, E. L. (2007).

Usually local affiliated NGOs alongside community's leaders and volunteers play a very active role is disseminating information to the local population. According to Gilles; (2002) individuals involved in such activities are an extension of the health system and they work alongside competent health professionals or health nongovernmental organizations in accordance with standards established by different governments. Pates, H., & Curtis, C. (2005)

Statement of the Problem

Malaria is still hyper endemic in Ghana and a leading cause of morbidity and mortality in Sub-Saharan Africa especially during pregnancy. It is as a results of this that the government has fully embraced the global "Roll Back Malaria" (RBM) programme which has the use of LLIN especially by pregnant women and children under five years as one of its key strategies. Moreover, as part of controlling and preventing malaria, the National Malaria Control Programme (NMCP), other NGOs and donor partners like WHO, USAID and UNICEF have been supplying free LLINs to pregnant women and mothers with children under two years through Maternal and Child Health campaigns which is through school distribution for class two pupils and class five respectively in Ghana (MOH, 2008), but the Okaikoi South Sub Metropolitan distributed about 95,500 LLINs to both pregnant women and mothers with children under two years in the Municipality as a means of controlling malaria. But yet from the SubMetro annual report (2018), malaria in pregnancy is still a problem.

It is by this background that the researcher aimed to investigate into the Knowledge, availability and utilization of long lasting insecticide treated bed net among pregnant women in Okaikoi South Sub Metropolitan in Greater Accra Region of Ghana.

Research Questions

This project was guided by the following questions;

1. What is the knowledge of community members with regard to LLIN?
2. Are the free nets distributed available at house household level?
3. Are the LLIN been put into use?

Research Objectives

Main Objective:

To ascertain the level of LLIN utilization among pregnant women in the prevention of malaria in Okaikoi South Sub Metropolitan.

Specific Objectives:

- ✓ To determine the knowledge of pregnant women on the importance of LLIN
- ✓ To determine the availability of LLIN to pregnant women
- ✓ To ascertain the use of LLIN among pregnant women

Significance of the Study

The study will help and serve as reference for the DHMT to improve and intensify their health education programmes on the utilization of LLIN among pregnant women in the Sub- Metro, and also will serve as a reference material for other researchers and learners.

Limitations to the Study

Wiliness of the mothers to respond to the questionnaire was one of the major limitation.

Profile of Study Area

Okaikoi South Sub Metropolitan District Council is one of the Six (6) Sub Metropolitan District Council of the Accra Metropolitan Assembly (A.M.A.). It shares boundaries with Okaikoi North to the North, Osu Klottey to the South, Ablekuma Central to the West and Ayawaso West to the East. The 2010 PHC estimated the population of the Sub-Metro as 121,718 with 13,378 houses and 34,800 households. Using the Greater Accra Growth Rate of 3.1%, it is estimated that the 2018 population of the area stands at 148,897.

The Sub Metro has Eight (8) Electoral Areas namely; Awudome, Goten, Kaatsean, Mukose, Bubuashie, Bubui, Avenor, Kaneshie. Some Communities within the area include; Darkuman, New Fadama, Kaneshie, Bubiashie, Avenor and many others. The Sub-Metro houses some

commercial activities such as banks, the Kaneshie Market, educational and health services. One major ceremonial and major roads running the Sub-Metro is the Kwame Nkrumah flyover which serves as a major connector as well as a nodal community for adjoining areas/Sub-Metros Metropolis and the region at large. (DHS, 2010)

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.0 Introduction

Lots of factors contribute to social and behavioral in response to Health Promotion Programmes, as in the case of the use of LLINs among pregnant women other than accessibility and availability of services. This section of the report focuses on the specific objectives, outlining each objective on the LLINs availability and usage among pregnant women.

2.1 Malaria

Malaria diagnosis involves identifying malaria parasites or antigens in patient's blood. Malaria is a potential medical emergency and should be treated accordingly. Delays in diagnosis and treatment are leading causes of death in many countries (Tangpukdee *et al*, 2009). About 0.6 to 1.2 million people died of malaria, which is transmitted by mosquitoes (female Anopheles) each year, especially in low income countries (Charles & Godfrey, 2013). Most malaria vector mosquitoes in Africa preferably feed on humans, making them to sustain extremely higher levels of transmission than other places thus making Africans more vulnerable to the disease (Lyimo *et al*, 2013). In persons without previoups immunity, malaria shows up severely and causes anaemia in pregnant women. Malaria also causes dysfunction in some organs of the body, example is the kidney. When someone is exposed to the disease repeatedly, the person acquires a considerable degree of clinical immunity but this is not stable and disappears after a six month away from the endemic-disease environment. However, when the person returns to the endemic-disease zone, the immunity reappears after some malarial infections (Nchinda, 1998; Bloland, 2001)

Malaria cases recorded at the out-patient- department (OPD) among pregnant women in 2013 were 217,000 representing 20% of pregnant women in attendance at the OPD (NMCP, 2013). During the 1950s, Ghana made an effort to reduce the malaria disease burden till it becomes no more a Public health issue by strategically introducing the insecticide treated nets which later became the long lasting insecticide treated nets as an intervention. However, malaria continued to

be the leading cause of illness in the country (GHS, 2014). This is partly due to several factors such as; poor living conditions, increase in drug resistance, climate and environmental change (Adams, Darko & Accorsi, 2014). In order to reduce malaria cases in pregnancy, WHO recommends three approaches: providing prompt access to effective treatment; use of insecticide treated nets (ITNs); and intermittent preventive treatment (IPTp) with sulpadoxine-pyrimethamine (WHO, 2004).

2.2 Use of Long Lasting Insecticide Treated Nets.

LLINs are impregnated with an insecticide which is effective for three years or twenty washes, thus making it more effective than the untreated nets. The insecticide repels and most often kills the mosquitoes or has knock-down effect so that the parasite can no longer be transmitted even to those not covered by the nets (WHO, 2004). Malaria transmission usually occurs from evening till dawn so if the LLINs are used effectively and maintained the transmission will be stopped and prevalence of malaria will be reduced (WHO, 2004). Many randomized control trails have shown that use of LLINs consistently during pregnancy has produced very good outcomes in the lives of the mothers and their infants (Gamble, Ekwaru &Kuile, 2006).

The consistent use of LLINs is among the most effective tools for the prevention of malaria. LLINs can reduce malaria transmission by up to 90% and prevent about 44% of all-cause maternal anaemia (Baume & Marin, 2008). Countries which are prone to malaria did some combination of education, demand creation, reduction of taxes and tariff on LLIN, commercial LLIN market development and programmes to reach the most vulnerable populations with subsidized LLINs after the Roll Back Malaria summit at Abuja on April 25, 2000 in order to have 60% of the two most vulnerable groups, which pregnant women is one of them, to use LLINs (Willey *et al,* 2012). Ghana was part of the Roll Back Malaria initiative of the WHO that targeted at halving the malaria burden by 2010 and so Ghana embarked on the distribution of LLINs in

order to prevent the transmission of malaria. This came as a response to the US President's Malaria initiative to support malaria-control programmes in Africa (Buabeng, 2010). After the distribution, the question is are people especially pregnant women using LLINs for the purpose for which it was given to them? In 2008, the Nigerian Demographic and Health Survey reported that the rate of the use of LLINs is below 10 % which has consistently been low (NPC & DHS, 2008). It was also shown in other studies that several countries in malaria endemic sub-Sahara Africa had very low utilization rate of the LLIN (Van Eijk *et al*, 2011).

2.3 Knowledge on Malaria and LLIN Use.

There are several factors that influence the use of LLIN by pregnant women which include education, place of residence and access to antenatal care services (Eisele, Keating, Littrell, Larsen, & Macintyre, 2009). It is also known that care seeking behaviour is positively influenced by educational level. For instance, in Ethiopia, it was revealed that higher educational attainment and residence in urban location among pregnant women were noticeable predictors of LLIN use in pregnancy (Chukwuocha *et al*, 2010). In another study, two key knowledge based predictors of the use of LLIN during pregnancy identified that those who knew that LLINs prevent the transmission of malaria were three times more likely to use bednets compared with those who did not. In a similar manner, women without misconceptions about malaria prevention used the LLINs more than those with misconceptions.(Ankomah *et al.*, 2012)

It has been found in a study that when LLIN ownership is compared with its use, pregnant women in rural areas were more likely to own LLINs, just for the fact that they were distributed freely to them, but when it comes to use, pregnant women in urban areas are almost twice as likely to use the LLINs (Ankomah *et al.*, 2012). Above all, having the knowledge that LLINs prevent malaria transmission is the only indicator that stands strong in explaining both LLIN ownership and use (Ankomah *et al.*, 2012). There is, therefore the need to intensify educational programmes on the

transmission of malaria and its prevention at the community levels and the antenatal clinics so that the pregnant women will understand the reason behind the mass distribution of the LLINs and use them appropriately to enhance behavioural change which will be beneficial to them and their unborn babies and the whole nation as well.

2.4. Socio –Cultural Beliefs Affecting Use of LLINs.

Many researches have revealed that there are lots of misconceptions about the knowledge of the causes of malaria (Ahorlu *et al*, 1997; Abate, Degarege, & Erko, 2013). In Ghana for instance, malaria was seen as an environmentally related disease caused by excessive contact with external heat which disturbs the blood equilibrium (Accorsi, S. (2014).

In Tanzania, a study showed that although the majority of women slept under an untreated bednet while pregnant, the use of subsidized ITNs during pregnancy was low despite widespread knowledge of the scheme (Tami *et al*, 2006). However, when the baby is born, the parents decide to purchase the subsidized ITNs and use them but not during pregnancy. This was as a result of the women thinking that the treated nets are meant for the unborn child rather than for the pregnant woman and the foetus (Tami *et al*, 2006). In Uganda, although malaria is perceived as a dangerous illness among pregnant women and children and there is high awareness on the benefits of LLINs, yet few people use them. This is because of its high cost and the perception that the chemicals that are used in treating them have adverse effects on pregnancy and the foetus (Mbonye *et al*, 2006). A study conducted in the Kassena Nankana district in Ghana revealed that net use by pregnant women varied from 42 percent in primigravidae to 63 percent in multigravidae, although the treated nets were distributed freely. (Brown *et al*, 2001). Their reason for not using the nets was mainly as a result of the warm weather and the perceived absence of mosquito biting. (Brown *et al*, 2001). Based on the foregoing, it means that the refusal to sleep under LLINs is not as a result of the high cost of the product but because of wrong perceptions of the dangers of the malaria disease.

In Lagos state Nigeria, the majority of the pregnant women who became ill with malaria believed that mosquito bites accompanied by stress were responsible for their illness. Only 21.8 percent of the women did not associate mosquitoes with malaria. Though the women knew the symptoms of malaria but did not see it as a dangerous disease that could lead to death. Moreover, most of them used nets but they were not treated (Omolade, 2003). In studies conducted in the Gambia and Malawi, researchers revealed that respondents attributed multiple causes for fever, which included exposure to heat from the sun or fire, eating oily or starchy food, unhygienic surroundings and mosquitoes ,although not supernatural causes (Aikins, 1993; Helitzer- Allen *et al*, 1993; Okrah, Traore, Pale, Sommerfeld, & Muller, 2002). Similar patterns of inadequate knowledge of the disease have been reported in other studies among rural populations (Aikins, 1993; Vijayakumar, Gunasekaran, Sahu, & Jambulingam, 2009).

Thus, with misconceptions, pregnant women act in a way that seems best in their own best interest. Therefore, there is the need for pregnant women and the community they live in to understand and recognize malaria as a health problem and make great effort towards preventing it (Ruebush, 1993; Parks & Bryan, 2001).

CHAPTER THREE

METHODOLOGY

Overview

This chapter will focus on Study Approach and Design (SAD), Study Population, Sample Size Estimation, Sampling Technique (s) and Data Collection Tools/Methods as well as Data Handling/Analysis, Validity and Reliability of instruments.

Study Design

In this study, a cross sectional study design was used. The study was conducted to collect quantitative data from pregnant women who will attend Antenatal care clinics in Kaneshie Polyclinic of Okaikoi South Sub Metropolitan in Greater Accra Region

Study Population

The population to be covered in this study were pregnant women who attended Antenatal Care Clinic at Kaneshie Polyclinic. This covered pregnant women in their second visit and above. Those in their first visit were not eligible in this study because, they would have received the net on their first visit and not have used the net before the survey.

Sample Size Estimation

The number of pregnant women that were included in the study were sampled using the following formula

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

Where: N = the minimum required sample size.

Z = standard normal deviate corresponding to 95% confidence interval, which equals to 1.96.

P= proportion of pregnant women who attended Antenatal Care Clinic was 25%, Kaneshie Polyclinic Annual Report. (2018)

E = Is the Margin of Error on P estimated to be at 5%

Therefore, $n = \frac{1.96^2 * 16 (100 - 16)}{5_2}$

$n = 206$

Hence the required minimum sample size was206 pregnant women. The compensation for non-response calculation was calculated as: Study sample =206 Assuming 10% were not going respond to the questions 10%*206 =20.6 Therefore, about 21 pregnant women more were added to be interviewed to compensate for non-response. The total sample became 206+ 21 = 227.

Sampling Technique

Convenient sampling, (a Non-Probability) method was used to interview the respondents who attend Antenatal Care Clinic (ANC) for their second visit and above. The reason for using this technique (Convenient Sampling) is that, the respondents may not be available and some will not like to participant in the study because of waiting time at Ante Natal Care Clinic (ANC). The languages that were used were; English, Ga, Ewe, and Twi this is because they are commonly spoken by the people in the Municipality.

Data Collection Tools/Methods

Data was collected by interviewing study participants with questionnaire. The interviews were conducted by two trained interviewers to obtain information on Knowledge, availability and utilization of long lasting insecticide treated bed net among pregnant women in Kaneshie Polyclinic - Okaikoi South Sub Metropolitan in Greater Accra Region.

The questionnaire consisted of a list of questions that address the objectives of the study.

These include Demographic Characteristics of the respondents, Knowledge, availability and utilization (Usage) of long lasting insecticide treated bed net.

Data handling and analysis

The questionnaire was designed on a paper. Therefore paper form the questionnaire was used to solicit the responses. The procedure was explained to the respondents before administering the question to them. STATA and Excel spreadsheet were also be used to run the frequency tables and the data was presented in tables, and all variables was be in narrative

Pretesting of Instruments

To determine reliability of the instrument, the pretesting of the instrument was in Amasami Government Hospital and the items on the questionnaire were analyzed critically with the supervisors to determine the validity of it.

Validity of the instrument

Validity is concerned with the accuracy of the measurement scale (Garcia, Rodriguez, & Carmona, 2009). The focus of the study is to Knowledge, availability and utilization of long lasting insecticide treated bed net among pregnant women in Kaneshie Polyclinic - Okaikoi South Sub Metropolitan.

To ensure validity of the questionnaire, the researcher was ensure that the items on the questionnaire represented the domain of interest. Again, the items on the instrument were reviewed by the supervisors, colleagues and other experts in the field of for all corrections done and anomalies corrected before the actual administration of the instrument.

Reliability of the instrument

Reliability is the extent to which a study instrument or any measurement procedure produces the

same results on repeated trials. Reliability determine the stability or consistency of scores over time or across ratter's (Burns & Grove, 2005; Polit & Beck, 2004). To ensure reliability the researcher focused much on the research question. This means that, the questionnaire covered every aspect of the research questions. Also the pretesting was done to correct all errors before the actual work will commence. The data collectors were well trained and are familiar with the items (questions) as to make sure they follow the guidelines given.

Ethical Considerations

Permission was sort from the Management of Kaneshie Polyclinic before data was collected. There were no risk associate with the study and there were no material or financial benefit to respondents. The information that were obtained will inform the management of the region about the LLINs. Data collected was stored and protected using a password. The result of the findings was communicated to the facility Management for further decisions.

CHAPTER FOUR

RESULT

Introduction

This chapter presents the result obtained from the survey on pregnant women's to ascertain the level of LLIN utilization among pregnant women in the prevention of malaria in Okaikoi South Sub Metropolitan., Also the perception of the pregnant women about the use of LLIN during pregnancy, and factors that facilitate the use if LLIN usage among pregnant women

SECTION A: DEMOGRAPHIC CHARACTERISTICS OF THE RESPONDENTS

4 .1 Background characteristics of the respondents.

A total of two hundred and twenty six (226) pregnant women (respondents) responded to the survey with the score rate of 100% (226). The result of the study revealed 32.71 mean with the standard deviation of 5.41 of the Age categories. With regards to educational accomplishment, the majority 47.58% (108) attended school up to tertiary while 8.81% (20) had no education. Again, majority of the pregnant women were Sales and Services (traders) by occupation 25.11% (57) and 7.25% (17) were Unskilled Manual (type of profession with no intellectual ability). A lot of the pregnant women 45.81% (104) were Christians while Muslims with 43.61% (99) were next to Christians. Considering marital status, about 66.8% (151) were married, 24.8% (56) were single while 705% (17) were Co-Habiting. (A state of living together and having sex without being married)

Table 4:1. Description of the demographic variation of the respondents

Value	Frequency (N=226)	Percentage
Tertiary	108	47.58
Secondary	72	31.72
Primary	26	11.45
No Education	20	8.81
Religion		
Christian	104	45.81
Muslim	99	43.61
Traditional/Spiritualist	15	6.61
No Religion	8	3.52
Occupation		
Sales and Services	102	45.13
Professional/Technical/Managerial	55	24.34
Skilled Manual	34	15.04
Agriculture	18	7.96
Unskilled Manual	17	7.52
Clerical	0	0.00
Marital Status		
Married	151	66.8
Single	56	24.8
Divorced	1	0.4
Widow	1	0.4
Co-Habit	17	7.5

SECTION B: KNOWLEDGE OF PREGNANT WOMEN ON THE IMPORTANCE OF LONG LASTING INSECTICIDE TREATED BED NET (LLIN)

From the study it was revealed that 97.7% of the pregnant women said the LLIN serves as a barrier between them and the mosquito. Whereas 0.8% said they have no idea. 77.09% knew that the LLIN knocks and kill mosquitoes that land on them. However some 10.57% says it's not true.

Also it was observed that 62.56% of the respondents were of the view that they benefit from using the LLIN because they will not get sick of malaria where as 27.75% said they will not even get mosquito bites at all and that, it is very important for every pregnant woman to sleep under the bed net 89.8%. See table 4:2 for individual data of analysis

Table 4:2 Importance of LLIN to the Pregnant Woman

Value	Frequency (N=227)	Percentage (%)
Long Lasting Insecticide Bed Net serves as a barrier between the host (Pregnant women) and the Vector (Mosquito)		
Yes	222	97.7
Don't know	2	0.8
No	3	1.32
Long Lasting Insecticide Bed Net knocks mosquitos dead when lands on it.		
Yes	175	77.09
Don't know	28	12.33
No	24	10.57
Long Lasting Insecticide Bed Net prevents malaria transmission		

Yes	198	87.2
Don’t know	21	9.2
No	7	3
Primary motivation of mothers using the LLIN		
I will not get Malaria	142	62.56
I will not get Mosquito bites	63	27.75
The net expel the Mosquitos and Kill them	9	3.96
It serves as a barrier	7	3.08
Reasons for mothers sleeping under the bed net		
protect myself and my unborn child	179	78.85
Not to visit the hospital due to malaria	153	67.4
Not buying mosquito coils anymore	132	58.15
Save money	88	38.77
It is necessary for pregnant women to always sleep under		
LLIN		
Yes	204	89.8
Don’t know	20	8.8
No	2	0.8

SECTION C; AVAILABILITY/USAGE OF LLIN AMONG PREGNANT WOMEN

Out of 227 respondents, 86.78% own bed nets, and 43.17% have three nets for their households. The 12.78% who have no nets they have not even thought of getting some. Those who obtained their nets from the health facility accounts for 42.73%.They (42.73) did not travel for a long distance to obtain the net (74.89), for the nets are available at the maternity unit at the time of registration. About 52.42% of the pregnant women sleep under the nets every night meanwhile, 29.96% sometimes sleep under the nets. Their mean reason for not sleeping under the nets was

due to allergic reactions (38.33%). This allergic reaction is also the main challenge some (41.85%) pregnant women face in regard of using the bed net.

Table 4.3. Availability and Usage of LLIN among Pregnant Women

Value	Frequency (N=227)	Percentage %
Respondent owns LLIN		
Yes	197	86.78
No	29	12.78
Number of LLINs owned by your household		
Three	98	43.17
Two	60	26.43
One	25	11.01
Four and above	14	6.17
Reasons for not having the LLIN		
I just have not thought of it	18	7.93
It is too expensive, I cannot afford it.	6	2.64
It is not necessary	5	2.2
Place where the current LLIN in use by the household was obtained		
Health facility	97	42.73
Drug store	68	29.96
Market	34	14.98
Other please specify	4	1.76
Respondents travelled a long distance before getting the LLIN		
No	170	74.89
Yes	42	18.5
Frequency of using the LLIN		
Every night	119	52.42
One's a while/Sometimes	68	29.96

Whenever I remember	22	9.69
Reasons for Not Sleeping under the Bed Net		
Being allergic to the bed nets	87	38.33
Not having enough bed nets	23	10.13
lack of sufficient space to hang the net	22	9.69
Perceived poor quality of the net	6	2.64
land lord refusing to hang the net	6	2.64
Challenges with Using the LLINs		
allergy like reactions	95	41.85
Net not fitting, too rough, too hot weather	54	23.79
lack of sufficient space	51	22.47
No hook to attach	31	13.66
No bed	13	5.73

CHAPTER FIVE

5.0 DISCUSSION

Introduction

In this chapter the results obtained from the data analysis of the study are related to other findings in other works. Data was obtained from 227 pregnant women in Kaneshie polyclinic in the Okaikoi South Sub Metropolitan, of the Greater Accra Region.

5.1 Socio and Demographic Characteristics and Use of LLIN.

The study revealed that majority of respondents who owned LLIN are those who access health services at Kaneshie poly clinic slept under the LLIN the night before the survey. The study results showed that pregnant women responding to this survey have their mean age variable of 32 years.

The study revealed that, pregnant women who had some form of education and were using LLIN was. This is also seen in a study that was done in Ethiopia that showed that those who have some kind of educational level use LLIN than those without education (Graves, *et al,* 2011). The study showed that Christians who use LLIN was higher than Muslims and the average age was 28 years. Again the findings in the study support a study which was done in the Gambia which revealed that some religion can afford the bed nets because of their socio-economic status and the area that they live (Wiseman, *et al*, 2007). So if the occupations of some religion groups do not yield high income, then their ability to buy LLIN or other preventing materials of malaria will not be there or will be low. Thus, religion and area of residence are factors that influence LLIN use (Wiseman, *et al*, 2007). The findings in the study again support a study which was done across 15 countries to

assess LLIN use among children and pregnant women. It revealed that a mother's education, socio-economic status, sex of child, urban/rural residence and ethnicity were not associated with LLIN use (Eisele, *et al*, 2009). In another study which was done in Kenya, it revealed that the use of bednets was low and the possession of ITNs was significantly related with the mother's education, occupation and knowledge (Goesch, 2008). And also Macro, (2009) in his study revealed that LLIN usage was low but was above the target set at Abuja target of 60%

5.2 Knowledge of Pregnant Women on the Importance of Long Lasting Insecticide Treated Bed Net (LLIN)

The results of the study showed that majority of the respondents knowledge the important of LLIN and it use. This supports a study which was done in Northern Ghana which indicated that LLIN is the best tool in malaria prevention than others (Binka & Adongo, 1997). The findings in the study showed that most of the respondents had the knowledge that LLIN is safe and protect them against mosquito bites and that they will not get sick which will lead to miscarriage, abortion and death to them. Most pregnant women knew that malaria causes premature birth in pregnancy, and that the use LLIN will help prevent malaria. This shows that the more knowledge a pregnant woman has about malaria in regard to LLIN and how malaria is prevented, the higher is the chance of using the LLIN to prevent death to the unborn baby. This supports a study which was done in Ghana that revealed that a woman's educational level and high level knowledge about mosquito's bites made them to use the bednets (Buame &Franca-Koh, 2011).

The study shows that the majority of the respondents heard or received malaria messages from friends and also from Health facility/community health workers/personnel from NMCP. This is shown in a study which was done in Ghana from the 2011 MICS which supposes that women who stay in the large cities of Ghana have more exposure to information, education and communication (IEC) messages about how to enhance the control of malaria. This is really seen in television advertisements, radios and messages from midwifes at ANC about the promotion of

ACTs (GSS, GLSS, and GHS. 2008).

5.3 Availability of LLIN among pregnant women.

The results of the study showed that most pregnant women pregnant women owned LLIN which was obtained from the ANC during ante-natal visit. Thus, the LLIN are supplied free of charge. In a study conducted in Sudan, revealed that most pregnant women have net at home yet the usage was low. (Mnzava, A. (2013). Also in the Comoros Inland (Bacar, A., & Ma, A. (2016) majority of pregnant women owned LLIN and most of them use the net a night before the survey was conducted. However, the situation is different from what was carried out in Mali (Lucas, B., & Fornadel, C. (2015) where ownership, availability and usage are extremely low.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.0. Introduction

This is a cross-sectional study which assessed the knowledge of pregnant women on LLIN, also to find out the factors which affect the use of LLIN in the Kaneshie Polyclinic Municipality in the Greater Accra Region. The study revealed that 89.87% (204) of the participants sleep under LLIN yet the total usage (those who slept in the net a night before the survey) was 68.28% (155).

6.1. Conclusion

Findings from this study revealed that the majority of the participants in the study have LLIN at hoe but only 68.28% (89) of them slept under LLIN the night before the study. Again, most of the respondents said they will not get mosquito bites that will lead to getting malaria when they sleep under the LLIN and the nets are very useful. There also a gap between availability and utilization (92.63% and 68.28%). This showed that pregnant women are not using the bed net consistently and so the goal that was set at the Abuja Summit in the year 2000 by the Africa Heads of States to distribute LLIN in their countries, especially to pregnant women and children under five years of age (Willey *et al*, 2012).

6.2. Recommendations

1. For an intervention to yield a successful result, an effective health education, promotion on the importance of the product should be done in order to achieve desirable results. In this case, National Malaria Control Program, Ghana Health Service, Ministry of Health, District Health Directorates and Health providers at the Kaneshie polyclinic should gear

their education toward;

2. The behaviour change messages from NMCP, GHS, and MOH should also educate the pregnant women on the effect of malaria on the pregnant woman and the unborn baby.

3. NMCP and its stake holders should consider procuring conical type of net.

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QUESTIONNAIRE

Questionnaire for Assessing Pregnant Women on LLIN Use

IDENTIFICATION

Introduction:

I am a student of Kwame Nkrumah University of Science and Technology AISWM. I am here to collect information on Long Lasting Insecticide Nets (LLIN), this information is going to be used for research purpose only and it is expected that the outcome of the research will be used to improve on the Usage of LLIN in the Municipality. I therefore request for your time and cooperation to participate in this interview that will not take much of your time. You have every right to opt out from this exercise and your decision is highly accepted.

SECTION A: SOCIO-DEMOGRAPHIC CHARACTERISTICS 1. Age

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2. Education

a) Primary ----------1
b) Secondary----------2
c) Tertiary ----------3
d) No Education ----------4

3. Religion

a) Christian ----------1
b) Muslim ----------2
c) Traditional/Spiritualist ----------3
d) No Religion ----------4

4. Occupation

a) Professional/Technical/Managerial ----------1
b) Clerical---------- ----------2
c) Sales and Services----------3
a) Skilled Manual ----------4
b) Unskilled Manual----------5

c) Agriculture----------6

SECTION A. KNOWLEDGE ABOUT TRANSMISION AND PREVENTION OF MALARIA

5. Heard about malaria?
   a) Yes
   b) No
6. If (Yes) to question 9 above, where or how did you hear about malaria? a) Friends
   b) Family members
   c) Community meetings
   d) Radio
   h) Health facility/community health workers/personnel from NMCP
   i) Others (specify) ----------
7. best malaria health message?
   a) Everybody is at risk of malaria
   b) Malaria infection is dangerous for pregnant women
   c) Pregnant women must sleep under LLIN
   d) Pregnant women must take malaria prevention tablets in the presence of health worker
   e) I don't remember anything
   f) Any other (Please specify)
8. What does malaria do to a pregnant woman?
   a) Anaemia
   b) Premature birth
   c) Miscarriage
   d) Don't know
   e) Others …….

SECTION D; Malaria prevention using LLIN/ITN

9. Where did you first hear about or see LLIN?
   a) Friends
   b) Family members
   c) Community durba
   d) Radio
   e) Television
   g) Newspapers
   h) Health facility or Community Health Workers/ NMCP
   I) other ……..

10. What do you remember best about LLIN/ITN health message?
    a) LLIN/ ITN is safe to use for the whole family
    b) Pregnant women must sleep under LLIN/ITN everyday
    c) Use of LLIN/ITN protect against malaria infection
    d) I do not remember anything

1. Is it necessary for pregnant women to always sleep under LLIN/ITN? a) Yes
b) No
c) Don't know

12.Can Long Lasting Insecticide Bed Net prevent malaria transmission?
a) Yes
b) No
c) Don't know.

13. Do you think you have enough information about LLIN/ITN? a) Yes
b) No
c) Don't know.

14. What information would you like to get about LLIN/ITN?
a). How to use it
b). Where to get it
c). Importance of using it
d). any other (please specify)……...

SECTION E: APPROPRIATE USE OF LLIN BY PREGNANT WOMEN

15. Have you ever used LLIN/ITN?
a) Yes
b) No

16. When did you start using LLIN/ITN?
A) one year
b) six months
c) three months
d) Other specify

17. Would you consider using it every day if it is readily available? a) Yes
b) No

18. Did you sleep under Long Lasting Insecticide Bed Net (LLIN/ITN) last night? a) Yes
b) No

19. Do you know that before you first use LLIN/ITN you have to air inside for twenty four hours or more before sleeping under it to reduce any side effect? a) Yes
b) No

20. Where do you normally dry long lasting insecticide bed net (LLINITN) after washing? a) Under the sun
b) Under a shade
c) Any other (please specify) ----------

SECTION: BARRIERS TO THE USE OF LLIN AMONG PREGNANT WOMEN

21. Do you have LLIN?
a) Yes
b) No

22. If No to question 38 above, why don't you have one?
    a) It is not necessary
    b) It is too expensive, I can't afford it.
    c) I just haven't thought of it
    d) Others (specify)……
23. Do you consider LLIN expensive?
    a) Yes
    b) No
23. Did you have to travel a long distance before getting the LLIN? a) Yes
    b) No
24. Do you perceive LLIN as harmful to a woman during pregnancy? a) Yes
    b) No
25. If yes to the question 45 above, what is/are the major perceived problem(s)? a) No Comfort
    b) Causes heat
    c) Air hunger
    d) Any other (please specify)……
26. How offend do you use the LLIN?
    A. Every night
    B. one's a while/Sometimes
    C. Whenever I remember

27. Which type of net do you prefer? A. Rectangular Cotton
    B, Conical Cotton

SECTION E; FACILITATORS TO LLIN USE AMONG PREGNANT WOMEN

28. What is your Primary motivation of using the LLIN? (Choose only one response)

    a. I won't get Mosquito bites
    b. I won't get Malaria
    c. The net expel the Mosquitos and Kill them
    d. It serves as a barrier

29. Sleeping under the net makes me to …..
    a) to save money
    b) protect myself and my unborn child
    c) Not buying mosquito coils anymore
    d) Not to visit the hospital due to malaria

Thank You