

**SCHOOL OF PUBLIC HEALTH  
COLLEGE OF HEALTH SCIENCES  
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**UTILIZATION OF INTERMITTENT PREVENTIVE TREATMENT DURING  
PREGNANCY IN THE AWUTU SENYA EAST MUNICIPALITY: A CASE  
STUDY AT THE KASOA POLYCLINIC**

**BY**

**JOHN GBENATEY**

**(10247202)**

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**DECLARATION**

I **JOHN GBENATEY** declare that, apart from references made to works done by other authors which have been duly acknowledged, this work was independently done by me under supervision. I further declare that this work has not been submitted for the award of any degree in this university or elsewhere.

**JOHN GBENATEY** .....  
**(STUDENT)**                      **SIGNATURE**                      **DATE**

**DR AMOS LAAR** .....  
**(SUPERVISOR)**                      **SIGNATURE**                      **DATE**

## **DEDICATION**

I dedicate this dissertation to all mothers for their sacrifices and efforts to overcome various risks during pregnancy.

## **ACKNOWLEDGEMENT**

I thank God Almighty for His Divine Providence throughout the study. I sincerely thank Dr Amos Laar (academic supervisor) for his invaluable contribution towards this research work. I am grateful to the district director of Ghana Health Service in Awutu Senya East: Dr Kafui Senya as well as staffs and management of the Kasoa Polyclinic. Moreover, I appreciate my research assistants for their effort and commitment throughout the study. Finally, my heartfelt gratitude goes to my wife, Dede for supporting me with her fervent prayers, love and encouragement and our entire families. May God richly bless all and sundry who contributed in diverse ways towards this study.

## ABSTRACT

**Introduction:** Malaria in pregnancy has serious health outcomes especially to the pregnant woman and the unborn child. These may include premature delivery, low birth weight (LBW), fetal and maternal death. Adoption of intermittent preventive treatment (IPTp-SP) by government as an effective strategy for malaria prevention during pregnancy has been influenced by various factors such as attitude of health staffs and stock out of SP, hence the need to assess the factors associated with utilization to help improve uptake by pregnant women.

**Objective:** The study sought to assess client and health facility level factors associated with utilization of intermittent preventive treatment during pregnancy at the Kasoa Polyclinic in Awutu Senya East Municipality.

**Methods:** The study design was both descriptive and analytical cross-sectional involving a total of 255 randomly selected postnatal mothers at the Child Welfare Clinic who were within six months with permanent residence in the municipality. Questionnaire was used for data collection. Data collected were entered into Microsoft Excel and analyzed in STATA (statistical analysis software) Version 15 with Chi-square and logistic regression with statistical significance set at  $p < 0.05$ .

**Results:** Prevalence of IPTp-SP utilization was 86% (218/255), ( $p = 85.5\%$ , 95% CI = 0.8 – 0.90). Of these, 35.2% (78/221) received three doses of SP during antenatal care, 24.4% (54/221) received four doses of SP with 23.1% (51/221) also receiving two doses. ANC attendance significantly influences IPTp-SP utilization (AOR = 3.1, 95% CI = 1.3 – 7.4). No knowledge on the use of SP significantly reduces the odds of IPTp-SP utilization (AOR = 0.6, 95% CI = 0.3 – 0.96). No knowledge on the interval of SP administration reduces the odds of IPTp-SP utilization (AOR = 0.4, 95% CI = 0.2 – 0.8).

**Conclusion:** ANC attendance, no knowledge of the use of SP and the interval of SP administration after 1<sup>st</sup> dose, were significant predictors of IPTp-SP utilization during pregnancy. Health promotion strategies with a focus on strengthening community action should be employed by Community Health Nurses (CHNs) to get women involved in the education of other women on IPTp-SP during pregnancy.

## TABLE OF CONTENTS

DECLARATION .....	i
DEDICATION .....	ii
ACKNOWLEDGEMENT .....	iii
ABSTRACT.....	iv
LIST OF TABLES .....	ix
LIST OF FIGURES .....	x
LIST OF ABBREVIATIONS/ACRONYMS.....	xi
CHAPTER ONE .....	1
INTRODUCTION .....	1
1.1 Background .....	1
1.2 Problem statement.....	3
1.3 Research Questions .....	5
1.4 Objectives.....	5
1.4.1 General objective.....	5
1.4.2 Specific objectives.....	6
1.5 Justification .....	6
1.6 Conceptual framework .....	7
CHAPTER TWO .....	11
LITERATURE REVIEW .....	11
2.1 Malaria in pregnancy.....	11
2.2 IPTp-SP implementation and utilization.....	12
2.3 Factors associated with utilization of IPTp-SP .....	15
2.3.1 Health facility factors .....	15
2.3.2 Availability of SP .....	16
2.3.3 Provision of Water for SP intake.....	16
2.3.4 Number of Doses of SP taken.....	17
2.3.5 Health education.....	17
2.4. Clients level factors.....	18
2.4.1 Age.....	18
2.4.2 Educational Level.....	18
2.4.3 Residence.....	19

2.4.4 Knowledge on Malaria .....	19
2.4.5 Fear of Side Effects .....	19
2.4.6 ANC Attendance.....	20
2.4.7 Number of Pregnancies .....	20
METHODS .....	22
3.1 Study design .....	22
3.2 Study Area.....	22
3.3 Study variables .....	24
3.3.1 Dependent variable .....	24
3.3.2 Independent variables .....	24
3.4 Study population .....	24
3.4.1 Inclusion criteria .....	25
3.4.2 Exclusion criteria.....	25
3.5 Sample size determination .....	25
3.6 Sampling.....	26
3.7 Data collection technique .....	26
3.8 Data processing .....	26
3.9 Data analysis .....	27
3.10 Quality control.....	27
3.10.1 Training of research assistants.....	27
3.10.2 Pre-test/Pilot study.....	28
3.11 Ethical consideration .....	28
3.11.1 Access to study area .....	28
3.11.2 Confidentiality and anonymity .....	29
3.11.3 Compensation .....	29
3.11.4 Risk and benefits .....	29
3.11.5 Voluntary withdrawal .....	29
3.11.6 Consenting process .....	29
3.11.7 Data storage .....	30
3.11.8 Declaration of conflict of interest.....	30
3.11.9 Funding of proposal.....	30
3.12 Limitations and strengths of the study .....	30

CHAPTER FOUR.....	31
4.0 RESULTS .....	31
4.1 Socio-demographic characteristics of respondents .....	31
4.2 Utilization of Intermittent preventive treatment during pregnancy (IPTp - SP).....	33
4.3 Socio-demographic factors associated with utilization of IPTp-SP.....	34
4.4 Other client-level factors associated with utilization of IPTp-SP .....	37
4.5 Health facility factors associated with utilization of IPTp-SP .....	40
4.6 Results of multiple logistic regression .....	42
CHAPTER FIVE .....	44
5.0 DISCUSSION.....	44
5. 1 Utilization of IPTp-SP among respondents.....	44
5.2 Client level factors associated with IPTp-SP utilization.....	45
5.3 Health facility factors associated with IPTp-SP Utilization.....	47
CHAPTER SIX.....	48
6.0 CONCLUSION AND RECOMMENDATIONS .....	48
6.1 Conclusion.....	48
6.2 Recommendations .....	49
REFERENCE.....	50
APPENDICES .....	54
Appendix A: Participants‘ informed consent form .....	54
Appendix B: Questionnaire.....	57

**LIST OF TABLES**

Table 4.1 Socio-demographic characteristics of respondents (n = 255).....	32
Table 4.2 Socio-demographic factors associated with utilization of IPTp-SP .....	36
Table 4.3 Other client-level factors associated with utilization of IPTp-SP.....	39
Table 4.4 Health facility factors associated with utilization of IPTp-SP.....	41
Table 4.5 Factors associated with IPTp-SP utilization .....	43

## LIST OF FIGURES

Figure 1.1: Conceptual framework of factors influencing utilization of IPTp (SP) .....	10
Figure 3.1: Map of Awutu Senya East Municipal Assembly .....	23
Figure 4.1 Proportion of post-natal women who received IPTp-SP during antenatal care .....	33
Figure 4.2 Number of doses of SP received by mothers.....	34

## LIST OF ABBREVIATIONS/ACRONYMS

ACT	Artemisinin-based Combination Therapy
ANC	Antenatal care
AOR	Adjusted Odds Ratio
ASEMA	Awutu Senya East Municipal Assembly
CHN	Community Health Nurse
CI	Confidence Interval
CWC	Child Welfare Clinic
COR	Crude Odds Ratio
DHIMS	District Health Information Management System
DHS	Demography Health Survey
DHMT	District Health Management Team
DOT	Directory Observed Therapy
GHS	Ghana Health Service
GHS/ ERC	Ghana Health Service Ethics Review Committee
GSS	Ghana Statistical Service
HBM	Health Belief Model
HCW	Healthcare Worker
IPTp	Intermittent Preventive Treatment of malaria in pregnancy
IRS	Indoor Residual Spraying
ITNs	Insecticide Treated Nets
JHS	Junior High School
L.I	Legislative Instrument
LBW	Low Birth Weight
MiP	Malaria in Pregnancy
MOFEP	Ministry of Finance and Economic Planning

NHIS	National Health Insurance Scheme
NMCP	National Malaria Control Program
OPD	Out Patient Department
OR	Odds Ratio
PHC	Population and Housing Census
PMI	President Malaria Initiative
RBM	Roll Back Malaria
RCH	Reproductive and Child Health
SHS	Senior High School
SMP	Safe Motherhood Programme
SP	Sulfadoxine-pyrimethamine
SSA	sub-Saharan Africa
WHO	World Health Organization

## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background

Malaria in pregnancy (MIP) is a major public health problem with half of the world population at risk of infection, especially in an endemic region (World Malaria Report, 2013). Globally, malaria in pregnancy has been documented to cause serious health effects to both mother and the unborn child (WHO, 2016). Malaria infection may cause devastating health consequences such as spontaneous abortion, stillbirth, and low birth weight (Menendez, Alessandro, & Kuile, 2007). During pregnancy, several complications may result from malaria infections which can lead to premature delivery of the fetus, impairment of consciousness, seizures and cerebral malaria associated with abnormal behaviour or neurological abnormalities in the newborn (Meremikwu, Ezedinachi, & Ehiri, 2009). Also, pregnant women, as well as children under five years, are disproportionately affected by malaria worldwide, especially in developing countries where resources are scarce (Muhumuza et al., 2016).

In Africa, approximately 10,000 maternal and 20,000 infant deaths result from malaria annually (WHO, 2015). Also, the annual world malaria report indicated that about 80% cases of malaria occurred among pregnant women and approximately 90% deaths in children below five years in a malaria-endemic region (World Malaria Report, 2013). The report further estimated that about 50 million pregnant women in the malaria-endemic region are at higher risk of malaria than non-pregnant women. It also stated that, due to the partly transient suppression of the immune system during pregnancy, malaria infection have the tendency to cause severe forms of disease to pregnant women (Malaria factsheet, 2016).

The World Health Organization (WHO) in 2004, recommended intermittent preventive treatment of malaria (IPTp) with sulfadoxine-pyrimethamine (SP) together with insecticide-treated nets (ITNs) in response to tackle malaria. Other packages include effective case management of clinical malaria and anaemia (Malaria factsheet, 2016). In regions of high *Plasmodium falciparum* transmission, prevention of asymptomatic malaria is basically through IPTp-SP and ITNs utilization with the greatest health outcome such as reduction in both infant and maternal morbidity and mortality (World Malaria Report, 2013).

The WHO recommendation for IPTp-SP includes three doses of SP taken monthly interval starting from the second trimester (Hill et al., 2013). In Africa, reports showed that more than 80% of women make multiple visits to antenatal during pregnancy. These visits provide a major opportunity for malaria prevention and various priority diseases that affect most pregnant women (Protas, Tarimo, & Moshiro, 2016). However, the effectiveness of this prioritized health interventions is usually influenced by a wide range of factors including attitude or behaviour of pregnant women and the wider community (Gysels et al., 2009). For instance, social and cultural factors of target groups often determine their attitude or behaviour towards a particular public health intervention. Also, these factors influence the demand and supply of malaria interventions. Moreover, the attitude of women towards pregnancy, pregnancy care, malaria and other illnesses can interact and influence, where and how to seek for malaria prevention and treatment (Pell, Straus, Andrew, Meñaca, & Pool, 2011).

In response to tackling malaria in pregnancy, the Ghana Health Service in conformity with WHO recommendation adopted SP as appropriate medicine for IPTp in the year 2003. The anti-malarial drug policy was updated in the year 2004 to reflect WHO guidelines on IPTp (GHS, 2010).

In spite of the fact that, chapter four of anti-malarial drug policy of Ghana which clearly stipulate that, IPTp should be administered as Directly Observed Therapy (DOT) on monthly interval during pregnancy until delivery; available data from Ghana demographic health survey (GDHS) showed a significant discrepancy between ANC attendance of four plus (4+) and IPTp uptake of three plus (IPT3+) doses of SP (GHS, 2010). These findings highlight the need to investigate all possible factors associated with utilization of intermittent preventive treatments during pregnancy.

## **1.2 Problem statement**

Each year, malaria kills more than a million people and also causes over 300–500 million clinical cases worldwide (World Malaria Report, 2016). Moreover, about 3.4 billion people, including pregnant women are at high risk of malaria infection (Ameh et al., 2016). Further estimates showed that 214 million new cases and 438,000 deaths occurred from malaria worldwide, with 88% of global cases of malaria occurring in Africa (WHO, 2015). In addition, evidence from research showed that 90 per cent of deaths from malaria occurred in sub-Saharan Africa (Stephen et al., 2016). Also, further estimates showed that 125.2 million pregnant women throughout the world are at high risk of malaria infection, with 81.5% of the global malaria disease burden occurring in sub-Saharan Africa (SSA) countries (Odjidja, Kwanin, & Saha, 2017). Additionally, pregnant women are the main adult group at high risk of the infection, especially in regions of high transmission (Ameh et al., 2016).

During pregnancy, malaria is an important risk factor for morbidity and mortality, especially among prim-gravid with serious health outcomes such as anaemia, preterm delivery with low birth weight (LBW) and intrauterine death (Mwandama et al., 2015). Also, a study conducted in

Eastern Uganda on the effectiveness of IPTp-SP found that women who did not receive IPTp during pregnancy accounted for all perinatal deaths (Nankabirwa et al., 2011).

To control malaria infection among pregnant women, WHO proposed insecticide-treated nets (ITNs), prompt and effective case management of clinical malaria illness and intermittent preventive treatment (IPTp) as both preventive and curative measures during pregnancy (Pell et al., 2013). Remarkable successes and effectiveness of IPTp-SP have been demonstrated in several studies in prevention of malaria among pregnant women but utilization, as well as coverage of IPTp-SP, have been low in sub-Saharan Africa countries, with an average of 11.77% coverage (Odjidja et al., 2017). Also, a countdown report to 2015 on ITNs, IPTp-SP and case management of clinical malaria illness in 20 African countries showed that IPTp-SP intervention had the lowest coverage among all the health services delivered to pregnant women (WHO, 2016).

In Ghana, a report by the National Malaria Control Program (NMCP) indicates that, at the Out Patient Department (OPD) alone, 11.3 million cases of malaria were recorded in 2013. In the same year, 417 cases per 1000 of the population were recorded. Moreover, presumptively diagnosed cases of malaria in pregnancy were 1.9% (NMCP, GHS 2013). The further estimate showed that malaria is the highest contributor of all OPD cases with 197,017 admissions and 9% deaths among pregnant women (NMCP, 2014).

In spite of the serious impacts of malaria during pregnancy, utilization of intermittent preventive treatment (IPTp-SP) as prophylaxis for malaria infection has remained considerably low, with uptake at 38.5% for optimal doses (3+ doses) while antenatal visits are about 87.3% (Odjidja et al., 2017). In Ghana, adequate doses of IPTp-SP ( $\geq 2$  doses) is still below the national target of

80% and this is a serious threat to reducing the incidence of malaria during pregnancy (Stephen et al., 2016).

Awutu Senya East Municipality has consistently recorded high cases of malaria. For instance, 8,900 (26.6%) cases of malaria were recorded in the year 2010, however, there was drastically increased in malaria cases in the municipality to 34,723 (49%) in the year 2011 (MOFEP, 2014). Despite the high levels of malaria cases in the municipality, utilization of intermittent preventive treatment during pregnancy at Kasoa Polyclinic remains low, with only 18.5% of pregnant women receiving SP (DHIMS2, 2016). However, studies to identify factors associated with utilization of intermittent preventive treatment during pregnancy at Kasoa Polyclinic in the Awutu Senya East Municipality are limited and non-existent. Therefore, the objective of this study is to assess client level and health facility factors associated with utilization of intermittent preventive treatment during pregnancy and suggest approaches to increased uptake among pregnant women.

### **1.3 Research Questions**

1. What is the prevalence of IPTp-SP utilization at Kasoa Polyclinic in Awutu Senya East Municipality?
2. What are the factors associated with IPTp-SP utilization at Kasoa Polyclinic in Awutu Senya East Municipality?

### **1.4 Objectives**

#### **1.4.1 General objective**

The general objective of this study is to assess factors associated with utilization of intermittent preventive treatment during pregnancy at Kasoa Polyclinic in Awutu Senya East Municipality.

### **1.4.2 Specific objectives**

1. To determine the prevalence of IPTp-SP utilization at Kasoa Polyclinic in Awutu Senya East Municipality.
2. To identify health facility factors associated with IPTp-SP utilization at Kasoa Polyclinic in Awutu Senya East Municipality.
3. To identify client-level factors associated with IPTp-SP utilization at Kasoa Polyclinic in Awutu Senya East Municipality.

### **1.5 Justification**

In controlling and prevention of malaria during pregnancy, World Health Organization (WHO) recommended and emphasized the use of Sulfadoxine-pyrimethamine (SP), ITNs as well as effective case management as packages, especially in the region of high transmission (Protas et al., 2016). Out of 45 African countries, 35 including Ghana adopted these strategies delivered through a collaborative effort between malaria control programs and reproductive health systems for four targets antenatal care (ANC) visits (Bouyou-Akotet, Mawili-Mboumba, & Kombila, 2013). The use of ITNs and IPTp-SP have been found to be inexpensive and cost-effective in reducing the adverse outcomes of malaria in pregnancy substantially (Worrall et al., 2007).

Although, remarkable successes have been made towards ITNs and case management of malaria access and utilization of IPTp-SP among pregnant women remain extremely low, which shows a failure of the public health community (Hill et al., 2013). For instance, Awutu Senya East municipality has consistently recorded high cases of malaria in pregnancy yet has low utilization of IPTp-SP among pregnant women. It is therefore imperative to identify factors associated with

utilization of intermittent preventive treatment during pregnancy in Awutu Senya East municipality in order to suggest measures to improve uptake.

## **1.6 Conceptual framework**

The conceptual framework illustrated in figure 1.1 below is an adaptation of Health Belief Model (HBM) used in the year 1950 by US Public Health Service for medical screening and reasons why such programs were always not successful (Hoch Baum, 1958). The model explains individual health-seeking behaviour with respect to perception of disease and strategies to decrease occurrence. Originally, the model was classified into four main constructs namely; perceived seriousness, perceived susceptibility, perceived benefits and perceived barriers a person may have about a disease. However, the accuracy of the model was later improved to include three additional constructs which include; cues to action, modifying factors and self-efficacy (Glanz, Lewis, & Rimer, 2002).

The HBM states that a person's belief about the severity of a disease signifies perceived seriousness. Perceived seriousness about a disease is believed to arise from knowledge or medical information a person holds that is likely to create problems or difficulties in her life (McCormick-Brown, 1999).

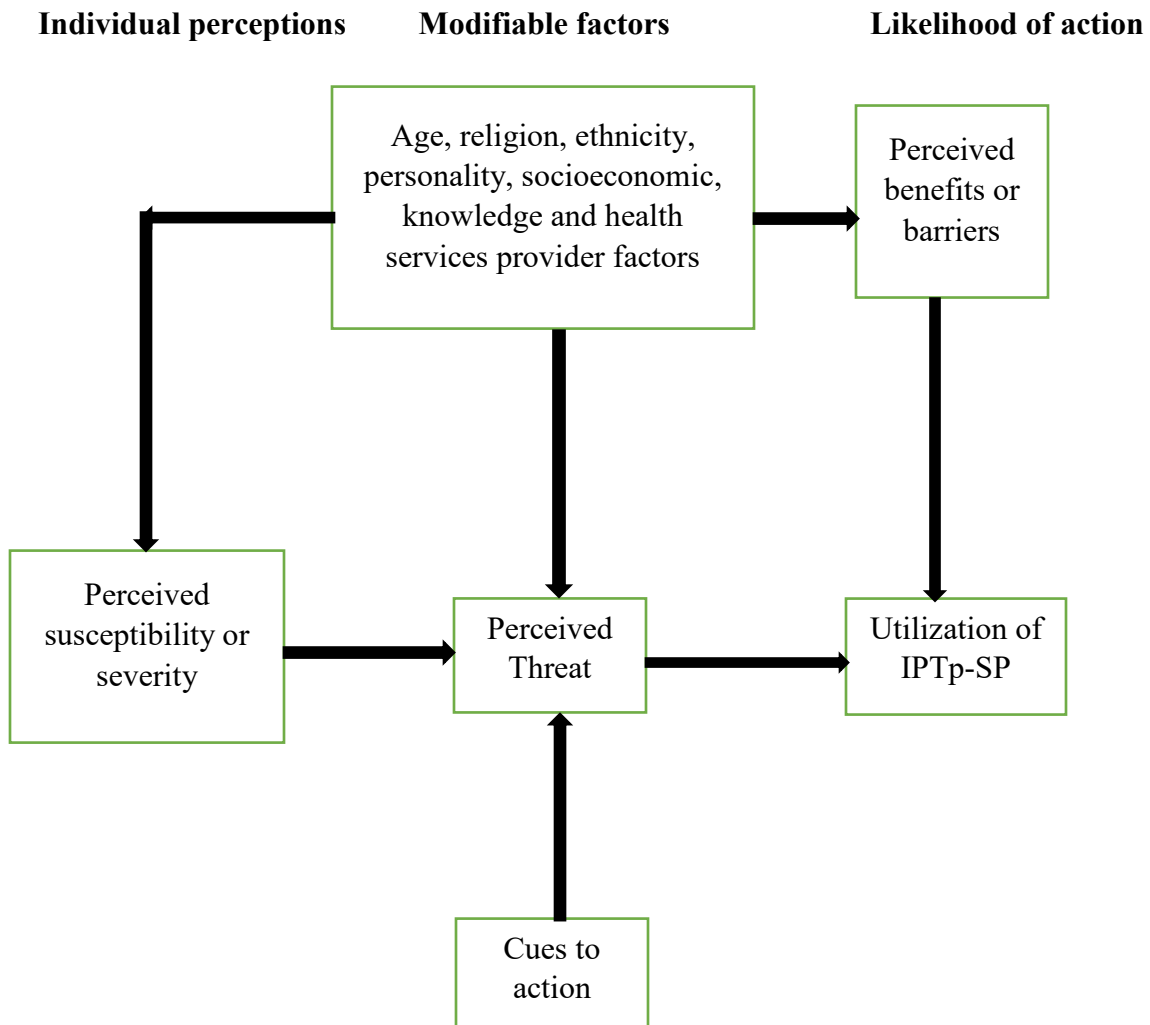
In addition, adoption of prescribed health-seeking behaviours arises from perceived susceptibility to a disease. It is believed that behaviour change occurs when the perceived risk of contracting the disease is greater. For instance, perceived susceptibility to malaria infection during pregnancy is what drives pregnant women to utilize prescribed interventions such as IPTp-SP and ITNs to decrease the risk of infection. However, when there is no risk of infection, the adoption of prescribed preventive measures and behaviour change remains low (Belcher, 2005).

The belief that, new behaviour change decreases the risk of getting a particular disease results from perceived benefit. It is also believed that an individual tends to adopt healthier behaviour change when such change in behaviour decrease the chance of getting infected. For this reasons, perceived benefits of SP and ITNs in malaria prevention is what encouraged the pregnant woman to consistently use ITNs and also visit ANC clinics for regular SP medication.

However, obstacles to new behaviour change result from perceived barriers. In other words, perceived barriers are personal assessments and evaluation of potential obstacles to adoption of new preventive measures and behaviour change. Janz and Becker (1984) stated that perceived barriers determined individual health behaviour change and it is most significant of all the constructs in the Health Belief Model. For instance, it is a belief that, a pregnant woman will only comply with medical prescriptions and appointments if such compliance outweighs noncompliance with a treatment regimen. The effort to overcome perceived barriers is what encouraged pregnant women to comply with preventive treatments such as IPTp-SP. For example, stigma, financial constraint, fear of side effects, pain and embarrassment are often considered as barriers to healthier behaviour change.

Furthermore, modifying variables such as age, marital status, educational level, occupation, religion, income, parity, gravidity, past experience and attitude of health workers are believed to influence a person compliance with treatment regimen. In addition, the likelihood of a healthier behaviour change to preventive measures is believed to be influenced by individual characteristics. Also, cues to action, such as events or people may influence change in a person behaviour. For instance, illness of a close family member, partner or peer due to non-conformity to a particular preventive measure may contribute to or influence behaviour change in that person (Ali, 2002).

Generally, people do not try out new things unless they have the capacity to do it. Furthermore, the ability to do something new is term self-efficacy (Bandura 1970). For instance, if an individual believes that, new behaviour change is relevant, but does not think she is capable of adopting, chances are high that such a change in behaviour may not be adopted. Hence, IPTp-SP utilization as a new preventive treatment to reduce susceptibility of pregnant woman to malaria may be a major constrained if she believes that taken SP may harm her fetus, therefore it is necessary to identify client level and health facility factors that are associated with IPTp-SP utilization in Awutu Senya East Municipality to inform policy decision making towards improving uptake among pregnant women.



**Figure 1.1: Conceptual framework of factors influencing utilization of IPTp (SP)**

Source: Adapted from (Chepkemoi Ng'etich Mutulei, 2013)

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Malaria in pregnancy

Malaria in pregnancy is predominantly caused by a protozoan parasite of genus *Plasmodium*. A disease commonly found among human and other animals mostly transmitted by infected female *Anopheles* mosquito. Additionally, the *Plasmodium* parasite that causes malaria in human have been classified into four main species namely: *P. falciparum*, *P. malariae*, *P. vivax*, and *P. ovale*, however, the *P. vivax* and *P. falciparum* are the two main parasites commonly found in sub-Saharan African countries including Ghana (Malaria factsheet, 2010).

According to the U.S. President's Malaria Initiative (PMI) Document (2008), *Plasmodium falciparum* accounts for 90-98% of cases of malaria, *P. malariae* 2-9% while *P. ovale* constituted 1% malaria cases. Sub-Sahara Africa alone accounts for approximately 90% of all malaria deaths reported globally. In addition, malaria-related diseases in Africa are mostly attributed to the *Plasmodium falciparum* parasite. Moreover, *P. falciparum* is considered dangerous and most devastating human malaria parasites among the four main species. Also, deaths resulting from malaria in sub-Sahara Africa (SSA) are attributed to the widespread of the mosquito *Anopheles gambiae* which is very difficult to control (WHO Report, 2002).

The prevalence of malaria infection was found to be high in Africa, Middle East, Asia, Central South America, Oceania and Hispaniola (Malaria factsheet, 2010). In Ghana, about 25.2 million people are at risk of malaria infection. This was attributed to seasonal variations of malaria transmission which occurs throughout the year. Additionally, health facility data from Ghana Health Service (GHS) showed that about 38% cases of malaria were recorded at outpatients,

36% in-patients and 33% accounted for deaths in children less than five years. Also, malaria in pregnancy cases reported in public health facilities was between 3.1 and 3.5 million with seasonal transmission. Furthermore, it is postulated that during pregnancy physiological and behavioural changes occur in the pregnant woman and this changes increased the attractiveness of the pregnant woman to the mosquito *Anopheles gambiae* complex (Lindsay et al., 2000).

Also, during pregnancy, the immune system of the woman becomes suppressed which predisposes her to the malaria parasite. Moreover, there is a high parasitaemia due to maternal susceptibility to malaria infections during pregnancy. This was found to interference with oxygen and nutrient supply to the fetus due to heavy placental sequestration (Roll Back Malaria, 2002).

## **2.2 IPTp-SP implementation and utilization**

At the Abuja declaration, Nigeria in 2000, all Heads of States of African representative pledged to ensure that, about 60 per cent of pregnant women living in malaria-prone areas would have access to effective malaria treatment by the year 2005. Ten years after the Abuja declaration, Ghana and several sub-Saharan Africa countries adopted IPTp-SP and insecticide-treated bed nets (ITNs) as a strategy for malaria prevention during pregnancy. However, despite increased coverage of the number of national representatives to 40 out of 47 Africa countries for either of the interventions, only a few of those countries have reached targets set for the year 2005 after the Abuja declaration in 2000. Moreover, despite all the policy interventions, Africa countries are still below the Roll Back Malaria Initiative targets of 80% ITNs and 100% IPTp coverage set for the year 2010 in malaria prevention (Van Eijk et al., 2011).

In sub-Saharan Africa (SSA) countries including Ghana, almost all health facilities provide IPTp-SP services for pregnant women, however, less than 5% of the pregnant women have access to effective malaria treatment (RBM info sheet 4, 2010).

A cross-sectional survey conducted on the use of prophylactic regimen showed that women who use SP for malaria prevention were less than 20%, especially in sub-Saharan African countries. It was also found that poor utilization of SP accounted for both maternal and infant morbidity and mortality from malaria infection (Akin eye et al., 2009).

Based on WHO recommendations, the National Malaria Control Program (NMCP) and Reproductive and Child Health (RCH) division of Ghana Health Service (GHS) together with partners developed the IPTp-SP implementation guidelines for malaria prevention during pregnancy. The implementation guideline stipulates the general objective of reducing malaria morbidity and mortality among pregnant women and infant. In addition, the specific objectives in the implementation guideline includes; reduction in malaria episodes with associated anaemia among pregnant women and also help reduce low birth weight (LBW) among newborns (WHO, 2014).

In Ghana, more than 90% of pregnant women attend ANC clinic at least once hence, making IPTp-SP intervention a clinic-based approach very feasible initiative. The key strategies with this initiative include; prevention and control of malaria at various levels through health education. Secondly, empower staffs at health facilities to use national guidelines to provide IPTp using SP as a drug of choice for pregnant women. Thirdly, assess drug efficacies for IPTp and identify possible side effects. Also, integrate the IPTp package with the Safe Motherhood Programme (SMP) such as Case management, foliate and iron supplements, deworming and ITN usage during pregnancy (NMCP, 2007).

In Ghana, the Revised Anti- Malaria Drug policy (June 2007) indicated that the most effective and preferred drug of choice in malaria prevention during pregnancy is SP. This is coupled with ITN usage after quickening (16weeks gestation). At this stage, the pregnant woman is expected to receive SP doses at monthly intervals at each ANC visits till delivery. The objective is to reduce malaria-related parasitaemia and to improve pregnancy outcome to both mother and the unborn child.

In addition, IPTp-SP is a comprehensive antenatal care strategy together with other packages such as haematinics and anthelmintic provision to pregnant women. Moreover, administration of SP is under ‘\_Directly Observed Therapy’ (DOT) by a qualified healthcare provider. Furthermore, pregnant women are expected to receive free ITN’s at ANC clinics and sleep under it throughout the gestation period for additional protection from mosquito bites (Revised Anti-Malaria Drug policy, June 2007).

The Ghana Health Service recommended that SP doses expected to be received by pregnant women should be at least three (3) doses at monthly interval. However, inadequate workforce, financial and technical resources were found to be the major challenges hindering the full implementation of IPTp-SP intervention (NMCP, 2007).

Reports also indicated that negative attitude of health staffs towards pregnant women at ANC attendance and discrepancies in IPTp data by health facilities, especially at district level contributed to the low uptake of IPT2 and IPT3 (Ghana National Malaria Strategic Plan 2008-2015 Draft, June 2008).

Also, due to the increased prominence of Ghana’s revised Poverty Reduction Strategy and the use of ACTs and indoor residual spraying (IRS), the new policy plan formulated was towards

malaria reduction (morbidity and mortality) to 75% in 2015 (with 2006 data as a baseline). This was to ensure that at least two or more doses SP were received under DOT by all pregnant women at ANC visits by 2015, however, utilization of IPTp-SP has still remained below-expected coverage in Ghana (Ghana National Malaria Strategic Plan 2008-2015 Draft, June 2008).

## **2.3 Factors associated with utilization of IPTp-SP**

### **2.3.1 Health facility factors**

In rural Nigeria, a study found that 23.9 per cent of pregnant women were able to define IPTp correctly due to adequate information received on IPTp-SP at ANC clinics. This contributed 52.3% uptake of at least one dose of SP while 40% of the pregnant women were afraid to take SP due to perceived outcomes due to inadequate information about IPTp-SP (Ehijie et al, 2007). However, it was found that knowledge about IPTp-SP during pregnancy need to be considered more relevant at ANC visits in order to increase uptake and coverage. For instance, to ensure that pregnant women get the right information, it is very necessary that all health staffs at ANC get adequate knowledge on IPTp implementation guidelines such that transfer of knowledge can be done appropriately.

In Kampala, a study found that only 1.6% of health workers sampled from three health facilities were trained on malaria in pregnancy guidelines. However, those who were trained were not even referring to the IPTp guidelines when attending to clients. It was established from the study that, regular training of healthcare workers on IPTp implementation guidelines was needed to update their knowledge and also help promote positive attitudes towards pregnant women at ANC clinics. The findings from the study were documented to result in increased uptake of 61% for IPT1 and 38% for IPT2 (Nankwanga & Gorette, 2008).

In Ghana, a similar study found that all the staff at ANC clinics knew when to start SP intervention for the pregnant woman, however, only 18 (60%) of the staffs knew exactly the time to stop SP administration. In addition, only 11 (36.7%) of the staffs have knowledge on common side effects of SP that the pregnant women were likely to experience. It was also found that only 17 (56.7%) of the staffs knew about the contraindication of SP administration (Antwi, 2010).

### **2.3.2 Availability of SP**

In Tanzania, the study also found that 40% of pregnant women did not receive SP due to unavailability of SP at the health facilities (Tarimo, 2007). Also, the 2008 Demographic Health Survey in Ghana found that 94.1% of health facilities provide IPTp-SP to pregnant women during ANC visits. However, stock out of SP was found to be the main bottleneck to the effective and successful implementation of IPTp-SP. Twenty-seven per cent (27%) of the health facilities were found to have stock out of SP in the past six months which contributed to low uptake of SP (DHS, 2008). Furthermore, periodic stock out of SP in the clinics were reported to result in the low uptake of SP of 36.8% in pregnant women in Ekiti State, Nigeria (Akinleye, Falade, & Ajayi, 2009).

### **2.3.3 Provision of Water for SP intake**

A study found that poor utilization of IPTp-SP during pregnancy was due to unavailability of safe and clean water at ANC clinics to practice DOT. The unavailability of safe and clean water was found to result in low IPTp-SP coverage because staffs could not comply with DOT policy of SP administration due to a shortage of clean and safe drinking water (Mubyazi et al., 2005). However, a cross-sectional study among twenty-eight public and six private health facilities offering ANC services in Enugu State, Nigeria found unavailability of water in the facility to

have no influence in the delivery of optimal IPTp-SP services to pregnant women (Onoka, Onwujekwe, Hanson, & Uzochukwu, 2012).

#### **2.3.4 Number of Doses of SP taken**

A study in Kisumu, Kenya found that only 43.4% of pregnant women received  $\geq 1$  and 23.7% received 2 doses of SP while 32.9% did not receive any of the SP doses during pregnancy (Van Eijk et al., 2004). Another cross-sectional study conducted in Asembo and Gem, Kenya by Ouma1 et al., (2002) found an increase in one dose of SP uptake between the year 2002 and 2005 from 19% to 61% and two doses of SP received from 7% to 17% by postnatal mothers in Asembo while in Gem, SP uptake only increased from 17% to 28% of one dose of SP and 7% to 11% of two doses of SP received by pregnant women. Reports from the study also showed that increase in SP coverage in Asembo was due to the training of the healthcare workers (HCW) on IPTp-SP implementation guidelines compared to the staffs in Gem who were not trained. Moreover, it was found that training of healthcare workers was necessary but that alone may not be sufficient for SP uptake, therefore, factors such as knowledge improvement on SP and respondent's socio-demographic characteristic can contribute significantly to increased SP coverage and utilization. Additionally, it was found from the study that, the healthcare workers were confused about the timing and direct observation of SP administration.

#### **2.3.5 Health education**

A study conducted in Kibaha District hospital, East Africa Coast, Tanzania, found maternal health education to be significantly associated with IPTp utilization during pregnancy (Marchant et al., 2008). Another study found that targets for Roll Back Malaria initiative in malaria prevention among pregnant women can only be achieved through training of both healthcare

workers and pregnant women in simplified messages on IPTp-SP implementation guidelines, especially at antenatal clinics (Oumal et al., 2002).

## **2.4. Clients level factors**

### **2.4.1 Age**

A study conducted by Antwi, (2010) in the Bosomtwi district of Ghana found the age of pregnant women and number of doses of SP received during pregnancy to be significantly associated with IPTp-SP utilization, however, the age of pregnant women was also found to be an unpredicted factor to IPTp-SP utilization after adjusting for other variables. In Tanzania, a similar study also found that age was not associated with IPTp-SP utilization (Marchant et al., 2008).

### **2.4.2 Educational Level**

In Jinja, Uganda, it was found that IPTp utilization during pregnancy was significantly associated with respondents' educational level, however, one limitation found from the study was that the investigator could not give a detailed explanation for the significant associations established between the study variables (Sangare et al., al2010). A similar study conducted in Luwero, Uganda, also found that failure on the part of pregnant women to take SP during pregnancy was due to lack of post-primary education (Mbungu et al., 2007). Another research conducted in Kenya also found that increased IPTp-SP uptake among pregnant women was significantly associated with attainment of higher educational levels (Eijla et al., 2002).

Sangare et al. (2010) reported that married women with primary education were adherent to IPTp-SP treatment course than unmarried women without formal education. In Tanzania, a similar study found socio-demographic characteristics of pregnant women such socio-economic status have no association with the uptake of IPTp-SP (Marchant et al., 2008). However,

significant relationship was found between religion and uptake of IPTp-SP intervention (Sangare et al., 2010).

### **2.4.3 Residence**

Marchant et al, (2008) reported that residing in urban areas has no association with IPTp-SP uptake by pregnant women. A similar study conducted in Jinja found that pregnant women residing in rural areas were relatively at high risk of taken full treatment course of IPTp-SP than women in urban areas during pregnancy (Sangare et al., 2010).

### **2.4.4 Knowledge on Malaria**

In Kibaha, Tanzania, Nganda RY et al., (2004) reported in a cross-sectional study that individual knowledge of malaria does not influence IPTp-SP usage by pregnant women. In other studies adequate knowledge of malaria was found to be associated with IPTp-SP utilization (Marchant et al., 2008). A cross-sectional study conducted among 209 pregnant women at the antenatal clinic in Ekiti State, Nigeria by systematic random sampling method reported that 27.3% of respondents who received at least one dose of IPTp-SP during the pregnancy were among 52.3% participants who have heard of IPTp-SP. It further stated that information on knowledge of IPTp-SP significantly influences SP used among pregnancy, hence the need to increase awareness of IPTp-SP among women (Akinleye et al., 2009).

### **2.4.5 Fear of Side Effects**

An exploratory study conducted, to assess perceptions and policy implication of SP in Mukono district, Uganda found SP as most effective medicine for malaria treatment. However, SP usage among pregnant women was perceived as the major cause of abortions and abnormalities in newborns (Mbonye et al., 2006). In addition, SP was also perceived as too strong for the pregnant woman and which usually weakens them. This perception about SP creates fear and has

been found to prevent mothers from taking SP during pregnancy. However, the study did not indicate any relationship between the respondent's educational level and perceptions of SP. Results from the study were however aimed at reviewing policy implications towards improving access and use of SP through health promotion strategies in order to demystify misconception about SP utilization during pregnancy (Mbonye et al., 2006).

#### **2.4.6 ANC Attendance**

A study in Kisumu, Kenya found early ANC attendance to be associated with adequate doses of SP received by pregnant women. This was attributed to the provision of health education to both clients and staffs on the timing of IPTp-SP during pregnancy. It was also found that 45 per cent of the respondents commenced ANC attendance in their third trimester. Moreover, late ANC visits were found to be significantly associated with low and incomplete IPTp-SP utilization (Van Eijk et al., 2004). According to Anders et al., (2008) early ANC attendance was found to be more likely among women with first pregnancy than women who have had multiple numbers of pregnancies. This was attributed to anxiety coupled with the sudden physiological changes that occur in the woman's body for the first time hence making her seek early care at the hospital than women who have had multiple pregnancies. Also, a cross-sectional survey among 293 women in Kibaha district of Tanzania on the determinants of IPTp-SP uptake found ANC attendance as the only associated factor for IPTp-SP uptake by pregnant women (Nganda et al., 2004).

#### **2.4.7 Number of Pregnancies**

In the Bosomtwi district of Ghana, a study found that the doses of SP received at ANC clinic by pregnant women was determined by the number of pregnancy experience or parity (Antwi, 2010). However, it was also found that gestation at first ANC attendance cannot predict whether

a pregnant woman would receive two or more doses of SP. Finally, a similar study in Offinso district of Ghana among 306 pregnant women with gestational age 32 weeks found a significant association between doses of SP received and gravidity. In the same study, 37% of the pregnant women who received three doses of SP were found to have more than two pregnancies (Tutu, Lawson, & Browne, 2011).

## CHAPTER THREE

### METHODS

#### 3.1 Study design

The study design was both descriptive and analytical cross-sectional which used a quantitative method to assess clients' level and health facility factors associated with utilization of intermittent preventive treatment during pregnancy at the Kasoa Polyclinic in Awutu Senya East Municipality.

#### 3.2 Study Area

Kasoa Polyclinic in Awutu Senya East Municipality (ASEMA) was the study facility. The municipality was carved out in the year 2012 from the former Awutu Senya District. Kasoa is the capital town as established by Legislative Instrument (L.I) 2025. According to the 2010 Population and Housing Census, the total population in the municipality was 108,422 which constituted about 4.9% of the population in Central Region (PHC, 2010).

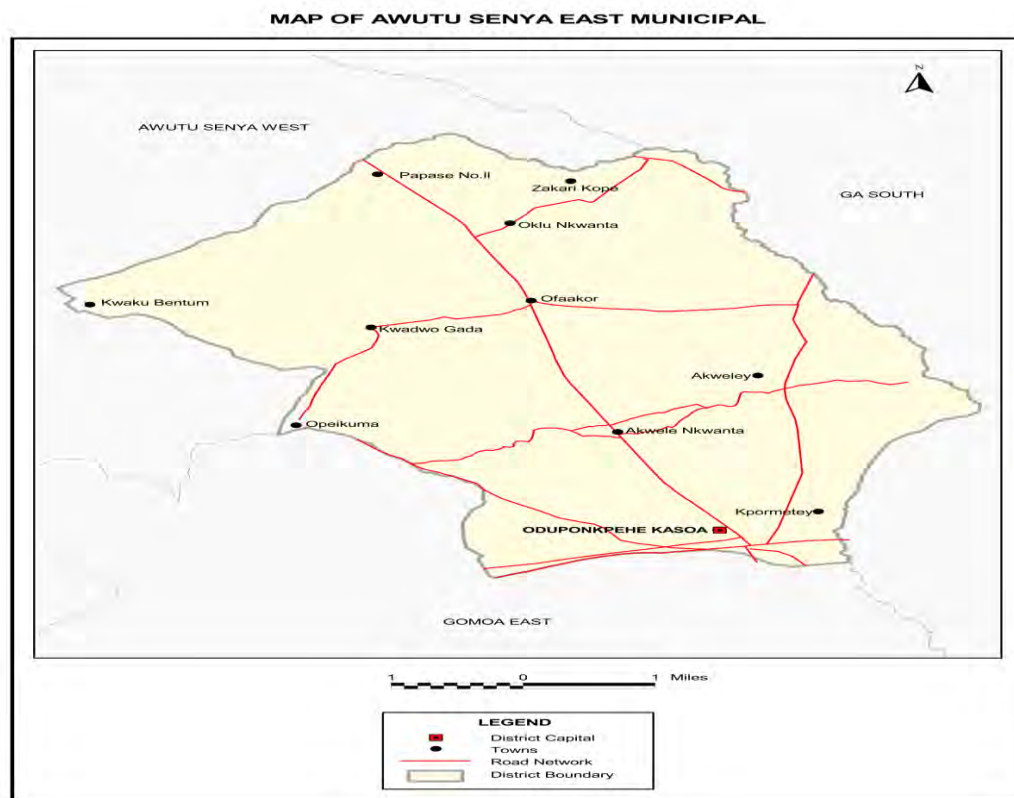
Awutu Senya East Municipality is located in the eastern part of Central Region within Latitudes 5°45' south and 6°00' north and from Longitude 0°20' west to 0°35' east. It shares common boundaries with Ga South Municipal Assembly (in the Greater Accra Region) at the East, Awutu Senya District at the North and Gomoa East District at the West and South respectively.

The total land area of the municipality is about 180 sq. km and covers about 18% of the total area of the Central Region. Kasoa the Municipal Capital is located at the south-east part, about 31km off the Accra-Capital. It is a mainly peri-urban area with few rural settlements. Other major settlements are Opeikuma, Kpormertey, Ofankor, Walantu, Zongo, Adam Nana and Akweley.

In Awutu Senya East Municipality, access to health services delivery is generally very low with available health facilities also woefully inadequate.

Moreover, private hospitals served as the highest level of health delivery system in the municipality. There were fifteen health facilities located in the municipality which consists of only three public and twelve private health facilities (GSS, 2014).

Kasoa Polyclinic where the study was carried out served as the main public health facility in Awutu Senya East Municipality. Figure 3.1 below shows the map of Awutu Senya Municipality



**Figure 3.1: Map of Awutu Senya East Municipal Assembly**

Source: [www.statsghana.gov.gh](http://www.statsghana.gov.gh).

### **3.3 Study variables**

The study variables include; dependent and independent variables

#### **3.3.1 Dependent variable**

Utilization of IPTp-SP was the dependent variable

#### **3.3.2 Independent variables**

Independent variables included:

1. Socio-demographic characteristics of participants (i.e. Age, occupation, marital status, religion, educational level, ethnicity, parity).
2. Economic factors (i.e. monthly income, possession of valid NHIS card and cost of transportation to the health facility).
3. Geographical access to the health facility (road network and distance to the health facility)
4. Client level factors (attitude of women and knowledge of IPTp-SP).
5. Health facility factors ( attitude of staffs, SP availability and DOT policy)

### **3.4 Study population**

Postnatal mothers with recent delivery who were within six months with permanent residence in the Awutu Senya Municipality constituted the study population. This included mothers attending Child Welfare Clinic (CWC) at Kasoa Polyclinic. The six months postnatal limit was set to mitigate recall bias among mothers in the study.

### 3.4.1 Inclusion criteria

Mothers with recent delivery who were within six months postnatal with permanent residence in the Awutu Senya East Municipality participated in this study.

### 3.4.2 Exclusion criteria

Mothers with recent delivery but were more than six months post-natal with no permanent residence within the Awutu Senya East Municipality were excluded from the study. Mothers who did not give consent to participate in the study were also excluded.

### 3.5 Sample size determination

A sample size of 255 recently delivered mothers was used which was derived from Cochran's sample size formula as shown below (Cochran, 1972).

$$n = Z^2 P (1-P) / (d)^2$$

Where

n = sample size required

Z = confidence level (95% level of confidence = 1.96)

P = Least reported prevalence of utilization of IPTp-SP = 18.5% (Derived from literature DHIMS, 2016).

d = Margin of error (5% = [0.05]).

Substituting,

$$n = (1.96^2 * 0.185 * (1 - 0.185) / 0.05^2) = 232.$$

Including 10% to make up for non-response and wrongfully filled questionnaires gave a total sample size of 255.

### **3.6 Sampling**

Respondents were selected using simple random sampling method. Mothers who recently delivered and were within six months of postnatal with permanent residence in the Awutu Senya Municipality were recruited at the Child Welfare Clinic of Kasoa Polyclinic. The postnatal mothers were made to pick pieces of paper each day with YES and NO written boldly on each from a box provided by the Principal Investigator. Postnatal mothers with YES papers willing to participate in the study, a well-structured questionnaire was administered to them. Postnatal mothers who were not willing to participate in the study were excluded. Also, administration of questionnaires was done with the help of two research assistants.

### **3.7 Data collection technique**

Collection of data on utilization of IPTp-SP from respondents was done with a questionnaire. Individual question on the questionnaire was read with detailed explanations to the mothers to choose options they deemed fit for a particular statement. The two research assistants also helped to administer the questionnaire and assisted in reviewing the ANC registers and records at the facility. Collection of data from each mother took approximately 30-45 minutes.

### **3.8 Data processing**

Information collected on the postnatal mothers was read to ensure that, questionnaires were filled accurately before the close of each section. Respondent's data was cleaned, coded and entered into Microsoft Excel. Validation of data was done to ensure the accuracy of responses for each respondent.

### **3.9 Data analysis**

Respondent's data was exported from Microsoft Excel to STATA (statistical analysis software) Version 15.0. Statistical tests were performed to establish any association between utilization of ITPp-SP and the various independent variables. Percentages were used to determine the proportion of mothers who utilized IPTp-SP during antenatal care while logistic regression model was used to test significance levels and the association between dependent and independent variables looking at crude odds ratios and adjusted odds ratio. Results from the statistical analysis were presented using tables, graphs and charts. The statistical significance level was set at  $p < 0.05$ .

### **3.10 Quality control**

Questionnaire for data collection was made brief which ensured an easy understanding by respondents. Two research assistants were trained and supervised appropriately throughout the data collection process.

The Ga South municipal hospital was used to pre-test questionnaire because it has similar characteristics as Kasoa Polyclinic. This helped to check for consistency of the study variables and also corrected errors that were identified. Respondent's data were cross-checked which ensured that all information on the questionnaire was completely and appropriately filled.

#### **3.10.1 Training of research assistants**

Two days training was organized for the research assistants. They were well equipped with the needed skills to assist prior to data collection. Their expected role, ethical issues and questionnaire administration process was clearly explained to them which ensured that the needed assistance was provided appropriately.

### **3.10.2 Pre-test/Pilot study**

The Ga South municipal hospital was used for pre-test of the questionnaire after the approval letter was obtained from Greater Accra Regional Health Directorate of the Ghana Health Service. Thirty-five recently delivered mothers within six months postnatal with permanent residence in the Ga South municipality were randomly selected at the Child Welfare Clinic for the pilot study.

This helped to identify and correct errors and cross-check the questionnaire before the actual study. Also, issues that were raised during the pre-test assisted in streamlining, standardizing and aided in completing the questionnaire before carrying out the actual study at the Kasoa Polyclinic in Awutu Senya East Municipality.

### **3.11 Ethical consideration**

Ethical approval with protocol identification number GHS-ERC071/02/18 was obtained from Ethical Review Committee of the Ghana Health Service (GHS), Research and Development Division, Accra after submitting a research proposal to the University of Ghana, College of Health Sciences research ethics committee for ethical clearance. In addition, a written informed consent was obtained from postnatal mothers at the Child Welfare Clinic (CWC) at the Kasoa Polyclinic prior to their participation.

#### **3.11.1 Access to study area**

The district director of Ghana Health Service in Awutu Senya East and management of Kasoa Polyclinic were contacted and notified of my intention to undertake the study. Subsequently, an introductory letter from the Head of Department (Population, Family and Reproductive Health), School of Public Health, College of Health Sciences, University of Ghana with letter of approval from Ghana Health Service Ethical Review Committee were sent prior to the study of which approval was granted to undertake the study at their facility.

### **3.11.2 Confidentiality and anonymity**

Data collected from respondents were coded and their names were not required after completion of the questionnaire. Also, the administration of the questionnaire to postnatal mothers was done in private to guarantee their privacy. Anonymity was ensured in the research findings and reports by assigning numbers coded to participant instead of names. Information's that were collected was kept strictly confidential under lock and key with password only known to the researcher.

### **3.11.3 Compensation**

Mothers in the study did not receive any compensation and were duly informed before they consented to participate in the study.

### **3.11.4 Risk and benefits**

There was no risk, cost or direct benefits associated with participating in the study. However, the respondent's time was lost in answering the questionnaire. Findings of the study were envisaged to help contribute towards policy decisions making in order to improve upon the quality of healthcare delivery to pregnant women at the Kasoa Polyclinic in Awutu Senya East municipality.

### **3.11.5 Voluntary withdrawal**

Mothers were informed that they can withdraw freely in the course of the study and this may not hinder or bring any challenge between them and principal investigator.

Data collected on a respondent who withdrew at any stage was deleted outright. Also, respondents were free to not answer any question.

### **3.11.6 Consenting process**

Respondents were approached at the CWC at Kasoa Polyclinic to seek for their consent prior to the study. This was preceded by an explanation of the objectives and purpose of the research.

Also, a signed written consent form was made available to respondents with a detailed explanation before taking part in the study.

### **3.11.7 Data storage**

Passwords were used for data storage in an electronic media format and strictly kept under locked boxes safely and were used for research purposes.

### **3.11.8 Declaration of conflict of interest**

There was no conflict of interest regarding this study as the Principal Investigator (PI).

### **3.11.9 Funding of proposal**

Per the budget statement, all the costs that were estimated for the study were incurred by the Principal Investigator.

### **3.12 Limitations and strengths of the study**

The study was conducted only at the Kasoa Polyclinic which limited generalization of findings to the entire Awutu Senya East Municipality even though Kasoa Polyclinic is the main public health facility within the Municipality and that may not be representative, therefore similar study should focus on the entire Municipality which will involve a larger sample size.

The strengths of the study include the six months postnatal limit which helped to reduce recall bias among the mothers. Reviewing the facility ANC attendance registers and mothers folders for information accuracy and consistency helped to curb the possibility of information bias. This gave enough accurate results from the postnatal mothers used in the study. Additionally, the simple random sampling method used in the study gave equal opportunity to the mothers which helped to reduce selection bias.

## CHAPTER FOUR

### 4.0 RESULTS

#### 4.1 Socio-demographic characteristics of respondents

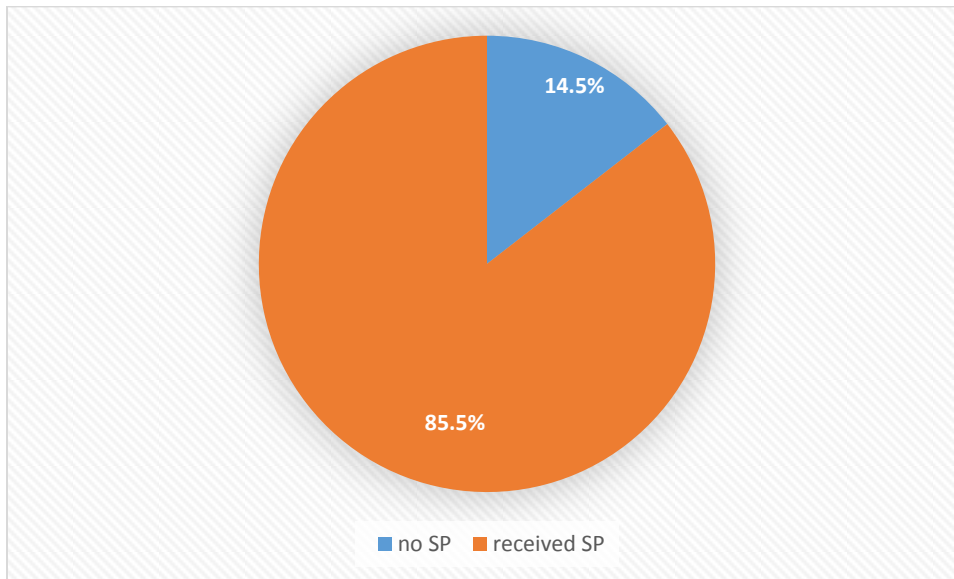
As shown in Table 4.1 below, most of the post-natal mothers were between the ages of 25 and 34 63.9% (163/255). With regards to educational attainment, 49.0% (125/255) of the postnatal mothers had completed Junior High School (JHS), 21.6 % (55/255) completed Senior High School (SHS) and 11.4% (29/255) were tertiary graduates. This was against a 10.6% (27/255) who had no formal education. Majority of the postnatal mothers were employed 72.5% (185/255) and most of the women were earning monthly incomes between the ranges of 300 – 500 Ghana cedi 62.2% (115/185). Seventy-eight per cent, 78 % (200/255) were married and Christianity was the dominant religion among respondents 76.9% (196/255). The Akan form the majority of the postnatal mothers 61.2% (156/255). Twenty-eight per cent (28%) of these women were residents in the rural areas (71/255) against 72% (184/255) who were urban dwellers within Awutu Senya East municipality. Forty per cent (40%) of these mothers have been pregnant three or more times (104/255). However, 31% (79/255) were primips (first-time mothers).

**Table 4.1 Socio-demographic characteristics of respondents (n = 255)**

<b>Variables</b>	<b>Frequency</b>	<b>Percent (%)</b>
<b>Age</b>		
15-24	54	21.2
25-34	163	63.9
35-44	38	14.9
45 and above	0	0.0
<b>Educational Level</b>		
None	27	10.6
Primary	19	7.4
JHS	125	49.0
SHS	55	21.6
Tertiary	29	11.4
<b>Employment</b>		
Unemployed	70	27.5
Employed	185	72.5
<b>Monthly income (n =185)</b>		
less than 300	38	20.5
300 – 500	115	62.2
Above 500	32	17.3
<b>Marital status</b>		
Unmarried	25	9.8
Married	200	78.4
Co-habitation	30	11.8
<b>Religion</b>		
Christianity	196	76.9
Islamic	59	23.1
<b>Ethnicity</b>		
Akan	156	61.2
Ewe	42	16.5
Ga	12	4.7
Others	45	17.6
<b>Residence</b>		
Rural setting	71	27.8
Urban setting	184	72.2
<b>Number of Pregnancies</b>		
First	79	31.0
Second	72	28.2
Three or more	104	40.8

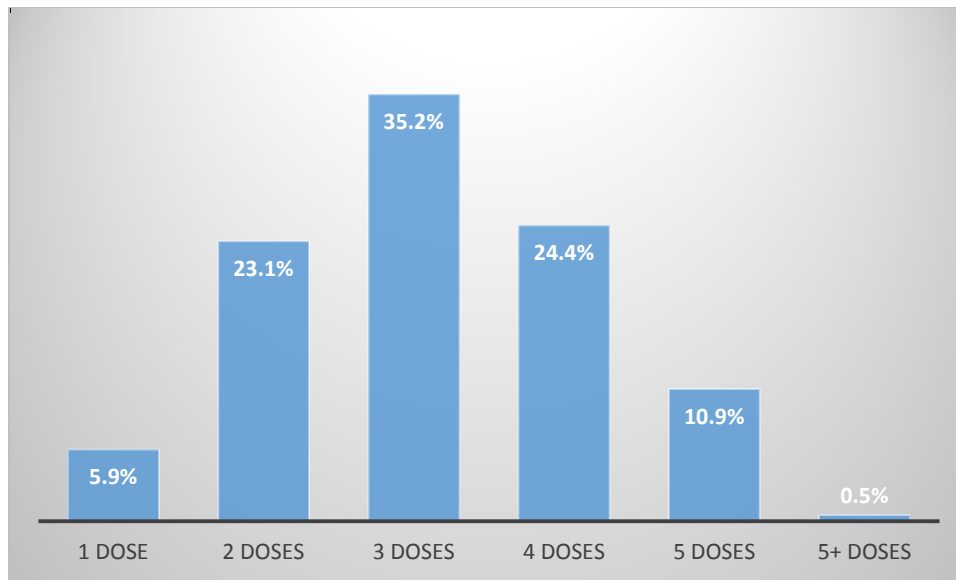
#### 4.2 Utilization of Intermittent preventive treatment during pregnancy (IPTp - SP)

As shown in figure 4.1 below, eighty-six per cent 86% (218/255) of post-natal mothers who were within six months after delivery received SP during their antenatal care ( $p = 85.5\%$ ).



**Figure 4.1 Proportion of post-natal women who received IPTp-SP during antenatal care**

Of these 85.5% (218/255) mothers who received SP at the Kasoa Polyclinic during pregnancy, figure 4.2 below shows that 35.2% (78/221) received three doses of SP, 24.4% (54/221) received four doses of SP with 23.1% (51/221) also receiving two doses of SP at antenatal care visits.



**Figure 4.2 Number of doses of SP received by mothers**

For postnatal mothers who utilized SP in their last pregnancy, the mean gestation week of the first dose of SP received was 19.9 weeks  $\pm$  4.3SD. The mean gestation week at which they received their last dose was 32.6 weeks  $\pm$  3.5 SD.

#### **4.3 Socio-demographic factors associated with utilization of IPTp-SP**

A simple logistic regression conducted between each socio-demographic factor and SP utilization among mothers during pregnancy revealed that age, educational level and the number of pregnancies were significantly associated with IPTp-SP utilization as shown in table 4.2 below.

Mothers aged 25-34 had significantly 2.3 times the odds of IPTp-SP utilization as compared to mothers aged 15-24 (cOR = 2.3, 95% CI = 1.03 – 4.9).

Comparing educational attainment of mothers, who had formal education either primary, junior high, senior high or tertiary to mothers with no formal education; it was found that mothers with primary education had significantly 2.9 times odds of IPTp-SP utilization (cOR = 2.9, 95% CI =

1.07 – 7.6). The odds of IPTp-SP utilization among mothers with tertiary education was 11.8 times as high compared to mothers with no formal education (cOR = 11.8, 95% CI = 1.4 – 102.1).

The odds of IPTP – SP utilization among mothers who were pregnant for the second time, was 4.7 times as high compared to those who were pregnant for the first time (cOR = 4.7, 95% CI = 1.5 - 14.6).

**Table 4.2 Socio-demographic factors associated with utilization of IPTp-SP**

Variables	Received SP		cOR(95% CI)
	Yes (n = 218)	No (n = 37)	
<b>Age</b>			
15-24	41(75.9)	13(24.1)	Reference
25-34	143(87.7)	20(12.3)	<b>2.3 (1.03 - 4.9)</b>
35-44	34(89.5)	4(10.5)	2.7 (0.8 - 9.0)
<b>Educational Level</b>			
None	19(70.4)	8(29.6)	Reference
Primary	15(78.9)	4(21.1)	1.6 (0.4 - 6.3)
JHS	109(87.2)	16(12.8)	<b>2.9 (1.07 - 7.6)</b>
SHS	47(85.5)	8(14.5)	2.5 (0.8 - 7.5)
Tertiary	28(96.5)	1(3.5)	<b>11.8 (1.4 - 102.1)</b>
<b>Employment</b>			
Unemployed	56(80.0)	14(20.0)	Reference
Employed	162(87.6)	23(12.4)	1.7 (0.8 - 3.7)
<b>Monthly income (n = 185)</b>			
less than 300	31(81.6)	7(18.4)	Reference
300 – 500	104(90.4)	11(9.6)	2.1 (0.8 - 5.9)
Above 500	27(84.4)	5(15.6)	1.2 (0.3 - 4.3)
<b>Marital status</b>			
Unmarried	21(84.0)	4(16.0)	Reference
Married	170(85.0)	30(15.0)	1.1 (0.3 - 3.4)
Co-habitation	27(90.0)	3(10.0)	1.7 (0.3 - 8.5)
<b>Religion</b>			
Christianity	168(85.7)	28(14.3)	Reference
Islamic	50(84.8)	9(15.2)	0.9 (0.4 - 2.1)
<b>Ethnicity</b>			
Akan	134(85.9)	22(14.1)	Reference
Ewe	37(88.1)	5(11.9)	1.2 (0.4 – 3.4)
Ga	11(91.7)	1(8.3)	1.8 (0.2 – 14.7)
Others	36(80.0)	9(20.0)	0.7 (0.3 – 1.5)
<b>Residence</b>			
Rural setting	58(81.7)	13(18.3)	Reference
Urban setting	160(87.0)	24(13.0)	1.5 (0.7 - 3.1)
<b>Number of Pregnancies</b>			
First	62(78.5)	17(21.5)	Reference
Second	68(94.4)	4(5.6)	<b>4.7 (1.5 - 14.6)</b>
Three or more	88(84.6)	16(15.4)	1.5 (0.7 - 3.2)
<b>Parity (M ± SD)</b>	2.3 ± 1.2	2.1 ± 1.3	1.1 (0.8 - 1.5)

#### 4.4 Other client-level factors associated with utilization of IPTp-SP

Other client-level factors apart from socio-demographic characteristics of mothers that were significantly associated with IPTp-SP utilization from simple logistic regression conducted were: information on IPTp, the source of information, knowledge of mothers on the use of SP, knowledge of dosage intervals for SP, gestation week of first ANC visit, ANC visits and NHIS status.

The odds of IPTp-SP utilization among mothers who had heard about IPTp was significantly 54.7 times the odds of utilization among those who had not heard about it (cOR = 54.7, 95% CI = 20.4 – 146.6) and those who heard about IPTp from the health facility had a significant increase in their odds of utilization of IPTp-SP compared to those who heard from radio or TV (cOR = 7.9, 95% CI = 1.4 – 45.8).

The mean gestation week of first antenatal visit among mothers who utilized IPTp-SP was  $15.3 \pm 6.8$ SD whilst the mean gestation week of first antenatal visit among those who did not utilize IPTp-SP was  $18.2 \pm 10.2$ SD. A one week increase in the gestation week at which a mother made a first-time visit to the Kasoa Polyclinic for ANC services significantly reduced their odds of IPTp-SP utilization by 6% (cOR = 0.94, 95% CI = 0.9 – 0.99).

Mothers who attended ANC visit for three times or more were found to have significantly higher odds of utilization (three times, cOR = 47.9, 95% CI = 2.9 – 778.5; four times and above, cOR = 24.3, 95% CI = 2.1 – 288.1). Mothers who “did not know” what SP was used for had 99% reduction in IPTp-SP utilization compared to mothers who knew that SP usage “prevent malaria” in pregnancy (cOR = 0.006, 95% CI = 0.002 – 0.2). Mothers who “did not know” the interval within which subsequent doses of SP should be received had 99% reduction in their odds of

IPTp utilization compared to mothers who knew that SP was received monthly after the first dose (cOR = 0.007, 95% CI = 0.002 – 0.2).

Moreover, mothers with valid National Health Insurance (NHIS) cards had significantly 12.5 times the odds of IPTp – SP utilization compared to mothers who were not on insurance (cOR = 12.5, 95% CI = 3.4 – 45.2).

**Table 4.3 Other client-level factors associated with utilization of IPTp-SP**

Variables	Received SP		cOR(95% CI)
	Yes (n = 218)	No (n = 37)	
<b>Information on IPTp</b>			
No	8(24.2)	25(75.8)	Reference
Yes	210(94.6)	12(5.4)	<b>54.7 (20.4 - 146.6)</b>
<b>Source of information on IPTp (n = 222)</b>			
Radio/TV	8(80.0)	2(20.0)	Reference
Health facility	191(96.9)	6(3.1)	<b>7.9 (1.4 - 45.8)</b>
Friends	11(73.3)	4(26.7)	0.7 (0.1 - 4.7)
<b>Gestation week of first ANC visit (M ± SD)</b>			
	15.3 ± 6.8	18.2 ± 10.2	<b>0.94 (0.9 - 0.99)</b>
<b>ANC visits</b>			
None	1(33.3)	2(66.7)	Reference
Once	4(28.6)	10(71.4)	0.8 (0.06 - 11.5)
Twice	19(63.3)	11(36.7)	3.5 (0.3 - 42.6)
Three times	48(96.0)	2(4.0)	47.9 (2.9 - 778.5)
Four times and above	146(92.4)	12(7.6)	24.3 (2.1 - 288.1)
<b>Knowledge of SP usage</b>			
prevent malaria in pregnancy	211(97.2)	6(2.8)	Reference
prevent a headache	0(0.0)	0(0.0)	
prevent menstrual pains	1(100.0)	0(0.0)	1
give appetite	0(0.0)	0(0.0)	
don't know	6(16.2)	31(83.8)	<b>0.006 (0.002 - 0.2)</b>
<b>Knowledge Monthly interval for SP administration</b>			
monthly after receiving 1st dose	188(97.4)	5(2.6)	Reference
2 months after receiving 1st dose	13(100.0)	0(0.0)	1
3 months and above after receiving 1st dose	8(100.0)	0(0.0)	1
don't know	9(21.9)	32(78.1)	<b>0.007 (0.002 - 0.02)</b>
<b>NHIS status</b>			
not on insurance (no valid card)	4(36.4)	7(63.6)	Reference
on insurance (valid card)	214(87.7)	30(12.3)	<b>12.5 (3.4 - 45.2)</b>

#### **4.5 Health facility factors associated with utilization of IPTp-SP**

Table 4.4 below displays the results of simple logistic regression conducted to determine the association between facility factors such as the cost of transportation, the condition of the road to the facility, attitude of health staff, availability of the drug, and description of distance to the health facility. Mother's perception of the nature of road to facility and fear of side effects of SP were found to be significantly associated with utilization of IPTp-SP. Mothers who feared side effects of SP had 96% significant reduction in their odds of IPTp-SP utilization compared to mothers who were not afraid (cOR = 0.04, 95% CI = 0.006 – 0.3). Mothers who perceived that the road to the facility was in bad condition had 50% significant reduction in their odds of using SP compared to mothers who perceived that the road to the facility was in good condition (cOR = 0.5; 95% CI = 0.2 – 0.99).

**Table 4.4 Health facility factors associated with utilization of IPTp-SP**

Variables	Received SP		cOR(95% CI)
	Yes (n = 218)	No (n = 37)	
<b>Perception on the cost of transportation</b>			
Not expensive	133(86.4)	21(13.6)	Reference
Expensive	85(84.2)	16(15.8)	0.8 (0.4 - 1.7)
<b>Actual cost of transportation in Ghana cedi (M ± SD)</b>			
	6.6 ± 4.0	8.4 ± 4.1	0.9 (0.8 - 1.02)
<b>Description of distance</b>			
Very far	27(84.4)	5(15.6)	Reference
Far	68(83.9)	13(16.1)	0.9 (0.3 - 2.9)
Not far	123(86.6)	19(13.4)	1.2 (0.4 - 3.5)
<b>Condition of road</b>			
Good condition	59(78.7)	16(21.3)	Reference
Bad condition	159(88.3)	21(11.7)	<b>0.5 (0.2 – 0.99)</b>
<b>The attitude of health staff</b>			
Very good	59(85.5)	10(14.5)	Reference
Good	142(85.0)	25(15.0)	0.9 (0.4 - 2.1)
Poor	17(89.5)	2(10.5)	1.4 (0.3 - 7.2)
<b>Availability of drug</b>			
Always available	182(85.5)	31(14.5)	Reference
Not available	36(85.7)	6(14.3)	1.02 (0.4 – 2.6)
<b>Duration for taking SP again (n = 42)</b>			
less than 2 weeks	1(100.0)	0(0.0)	1
3-4 weeks	28(96.6)	1(3.4)	1
Above 4 weeks	12(100.0)	0(0.0)	1
<b>Payment for SP (n = 229)</b>			
No	189(95.0)	10(5.0)	Reference
Yes	29(96.7)	1(3.3)	1.5 (0.2 - 12.4)
<b>Fear of side effect</b>			
No	130(78.3)	36(21.7)	Reference
Yes	88(98.9)	1(1.1)	<b>0.04 (0.006 - 0.3)</b>
<b>Waiting time too long</b>			
No	88(82.2)	19(17.8)	Reference
Yes	130(87.8)	18(12.2)	1.6 (0.8 - 3.1)
<b>Waiting time (n = 148)</b>			
less than 1 hour	2(100.0)	0(0.0)	1
1 to 2 hours	48(81.4)	11(18.6)	0.3 (0.1 - 1.1)
3 hours and more	80(91.9)	7(8.1)	Reference

#### 4.6 Results of multiple logistic regression

A stepwise multiple logistic regression with a backward selection method of all significant variables in the crude analysis left only three factors significantly associated with IPTp-SP utilization, well adjusting for other significant variables in the bivariate analysis (simple logistic regression).

Table 4.5 below shows that after adjusting for other variables;

1. ANC attendance significantly influences the odds of IPTp-SP utilization (AOR = 3.1, 95% CI = 1.3 – 7.4) compared to those who never attended.
2. No knowledge of SP usage significantly reduces the odds of IPTp-SP utilization (AOR = 0.6, 95% CI = 0.3 – 0.96) compared with those who knew it used to prevent malaria in pregnancy.
3. No knowledge on the interval of SP administration reduces the odds of IPTp-SP utilization (AOR = 0.4, 95% CI = 0.2 – 0.8) compared to those who knew it was given at monthly intervals after 1st dose.

**Table 4.5 Factors associated with IPTp-SP utilization**

<b>Variables</b>	<b>cOR (95% CI)</b>	<b>AOR (95% CI)</b>
<b>ANC visits</b>		
None (Reference)		
Three times or more	<b>2.9 (2.0 – 4.1)</b>	<b>3.1 (1.3 - 7.4)</b>
<b>Knowledge of SP usage</b>		
Prevent malaria in pregnancy (Reference)		
don't know	<b>0.3 (0.2 – 0.4)</b>	<b>0.6 (0.3 – 0.96)</b>
<b>Knowledge of monthly interval for SP administration</b>		
Monthly after receiving the 1st dose (Reference)		
Don't know	<b>0.2 (0.1 – 0.3)</b>	<b>0.4 (0.2 - 0.8)</b>

## CHAPTER FIVE

### 5.0 DISCUSSION

#### 5.1 Utilization of IPTp-SP among respondents

In this study eighty-six out of a hundred, 86% post-natal mothers who were within six months with permanent residence in Awutu Senya East Municipality received at least one dose of SP during their antenatal care. This is an indication that about 15% of mothers who attended ANC at the Kasoa Polyclinic and were resident in the municipality did not receive SP. This prevalence of non-uptake presents a worrying situation which needs to be addressed to prevent malaria during pregnancy. However, a similar study in Nigeria also found lower SP uptake of 52.3% (Ehijie et al, 2007). Of these 85.5% (218/255) who had received at least a dose of SP found in this study at the Kasoa Polyclinic, 35.2% (78/221) received three doses of SP during antenatal care, 24.4% (54/221) received four doses of SP with 23.1% (51/221) also receiving two doses. For mothers who utilized SP in their last pregnancy, the mean gestation week of the first dose of SP received was 19.9 weeks. This suggests that the mothers started ANC attendance before the 19<sup>th</sup> week of gestation. The mean gestation week of first antenatal visit among those who utilized IPTp-SP was  $15.3 \pm 6.8SD$  whilst the mean gestation week of first antenatal visit among those who did not utilize IPTp-SP was  $18.2 \pm 10.2SD$ . It was also found in this study that a one week increase in the gestation week at which a mother made a first-time visit to the Kasoa Polyclinic for ANC services significantly reduced their odds of IPTp-SP utilization by 6%. Van Eijk et al., (2004) asserted that late ANC visits were significantly associated with low and incomplete IPTp-SP utilization. In a contrary view, Antwi, (2010) found that gestation at first ANC attendance cannot predict whether a pregnant woman would receive two or more doses of SP. The early attendance

of ANC could explain the high uptake of 86% per cent recorded in this study. The mean gestation week at which they received their last dose was 32.6 weeks  $\pm$  3.5 SD.

## **5.2 Client level factors associated with IPTp-SP utilization**

This study found the socio-demographic factors and utilization of IPTp-SP among mothers during pregnancy. Age, educational level and parity were significantly associated with IPTp-SP utilization. Additionally, mothers aged 25-34 years had significantly 2.3 times the odds of IPTp-SP utilization as compared to mothers aged 15-24 years. Also, comparing educational attainment of mothers, who had any formal educational level thus; primary, junior high, senior high or tertiary to those who had no formal education, mothers with some formal education had significantly higher odds of IPTp-SP utilization but this association was found in multivariate to be insignificant. The findings from the Kasoa Polyclinic were in sharp contrast with a study from Tanzania that found no association between socio-demographic characteristics and SP uptake (Marchant et al., 2008). However, other studies in Ghana, (Antwi, 2010) and Uganda (Sangare et al., 2010) have found an association between socio-demographic characteristics such as age, educational level, religion, residence and marital status with IPTp-SP utilization.

Furthermore, client level factors that were found in the study at the Kasoa Polyclinic to significantly influence IPTp-SP utilization were: information on IPTp-SP, the source of information, knowledge of mothers on the use of SP, knowledge of dosage intervals for SP, gestation week of first ANC visit, ANC visits and NHIS status. The odds of IPTp-SP utilization among mothers who had heard about IPTp-SP was significantly higher among those who had heard about it compared to those who heard not heard about it. Also, mothers who heard about IPTp-SP from the health facility had a significant increase in their odds of utilization of IPTp-SP compared to mothers who heard from radio or TV. This finding further iterates the need for the

health professional to educate women on the importance of SP during pregnancy to enhance overall uptake.

Moreover, mothers who attended ANC visits for three times or more at the Kasoa Polyclinic were found to have significantly higher odds of IPTp-SP utilization. However, this finding from the study has to be cautiously interpreted owing to the wide confidence intervals. SP is usually given at the hospital during ANC visits, therefore it is expected that the IPTp-SP utilization would increase with increased ANC attendance. It is imperative for health workers to encourage ANC attendance by pregnant women.

Also, Knowledge of mothers on Malaria and IPTp-SP was found in this study to be associated with utilization of SP. It was found that mothers who "did not know" what SP was used for had a 99% reduction in IPTp-SP utilization compared to mothers who knew that SP usage "prevent malaria" during pregnancy. In addition, mothers who "did not know" the interval within which subsequent doses of SP should be received had 99% reduction in their odds of IPTp-SP utilization compared to mothers who knew that SP was received "monthly after the first dose". This may be the case because perhaps education at the facilities is not adequate or the methods used to educate these women may not be useful in achieving the overarching goal of SP utilization. A qualitative research to evaluate the methods of education used by health professionals to educate mothers on SP will help unearth the underlying reasons why some mothers lack the requisite knowledge of SP, its use and benefits. These findings are an indication that the education of mothers on the use of SP by health workers is necessary to ensure SP Utilization. Marchant et al., (2008) reported that the use of IPTp was found to be associated with adequate knowledge of malaria among pregnant women.

Furthermore, mothers with valid National Health Insurance Scheme (NHIS) cards had significantly 12.5 times odds of IPTp-SP utilization compared to mothers who were not on insurance. The valid National Health Insurance Scheme card in hospitals caters for most of the expenses when a pregnant mother visits the ANC clinics in Ghana, therefore when mothers are in possession of a valid card, it may motivate ANC attendance because it eases the financial burden of going for antenatal care. Pregnant women need to be encouraged to register for the National Health Insurance Policy.

### **5.3 Health facility factors associated with IPTp-SP Utilization**

In this study, facility factors such as the perceived condition of the road to the health facility were found to be associated with IPTp-SP utilization. Also, mothers who perceived that the road network to the health facility was in bad condition had 50% significant reduction in their odds of utilizing SP compared to mothers who perceived that the road to the health facility was in good condition.

The fear of side effects of SP was found to be significantly associated with reduced odds of IPTp-SP utilization in the study. This finding is consistent with Mbonye et al., (2006) who found that SP usage among pregnant women was perceived as the major cause of abortions and abnormalities in newborns. In addition, SP was also perceived as too strong for the pregnant woman and usually weakens them. These perceptions create fear and may prevent mothers from taking SP during pregnancy. However, these associations were no longer significant after multivariate analysis. There is the need for health workers to allay the fears and misconception of pregnant women on the use of SP and highlight benefits of SP to both the pregnant woman the unborn child.

## CHAPTER SIX

### 6.0 CONCLUSION AND RECOMMENDATIONS

#### 6.1 Conclusion

Eighty-six per cent (86%) of the post-natal mothers who were within six months received at least one dose of SP during their recent antenatal care. Out of these, 35.2% (78/221) received three doses of SP during antenatal care, 24.4% (54/221) received four doses of SP with 23.1% (51/221) also receiving two doses.

Client-level factors that were found in this study at the Kasoa Polyclinic to significantly associated with IPTp-SP utilization were: Age, educational level, number of pregnancies, information on IPTp-SP, source of information on SP, knowledge of mothers on the use of SP, fear of side effects of SP, knowledge of dosage intervals for SP, gestation week of first ANC visit, ANC visits and NHIS status. However, increased number of ANC visits (three or more) was a significant predictor of IPTp-SP utilization among pregnant women at the Kasoa polyclinic in Awutu Senya East municipality.

Also, No knowledge of mothers on the use of SP, No knowledge of dosage intervals for SP negatively influenced the IPTp-SP utilization among pregnant women.

Furthermore, facility factors such as the perceived condition of the road network to the Kasoa Polyclinic was found in the study to be associated with IPTp-SP utilization but was no longer significant in the multivariate analysis. Others facility factors such as the cost of transportation, distance, the attitude of health staff, Availability of SP, Payment for SP, Waiting time were unable to significantly predict IPTp-SP utilization among the six months post-natal mothers at the Kasoa Polyclinic during their last pregnancy.

## 6.2 Recommendations

- The management of Kasoa Polyclinic should organize sensitization programmes in collaboration with the District Health Management Team (DHMT) and Assembly on the need for ANC attendance when pregnant.
- Health education to all mothers at Child Welfare Clinics and antenatal clinics and community at large on malaria and its effect on pregnancy should be undertaken by the Ghana Health Service (GHS) and other Civil Society organizations.
- Health promotion strategies with a focus on strengthening community action should be employed by Community Health Nurses (CHNs) to get women involved in the education of other women on IPTp-SP during pregnancy.

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## APPENDICES

### Appendix A: Participants' informed consent form

School of Public Health  
College of Health Sciences  
University of Ghana

**Research Topic: Utilization of intermittent preventive treatment during pregnancy in the Awutu Senya East Municipality: A case study at the Kasoa Polyclinic**

#### Introduction

I am JOHN GBENATEY, pursuing a Master's in Public Health at the School of Public Health, University of Ghana, Legon. I am the principal investigator (PI) together with two research assistants on the above research topic.

We warmly invite you to take part in this study. But to be able to take part in the study, we would like you to make a decision by reading this consent form or let someone read it to you so that it guides you before you make a decision to take part or not in the study.

Participating in this research comes at no costs and also no payments awarded to participants. Approximately, 30-45 minutes time taken to answer individual questionnaire was the only cost that was incurred by participants.

#### Confidentiality

This study is a requirement for partial fulfilment in the award of Masters in Public, hence all information, as well as data collected in the study, will only be accessible to the researcher and supervisor. Anonymity will strictly be ensured in the dissemination of research findings since respondents in the study names will not be used to identify them. Data collected from

participants will be held in absolute confidence and was stored on electronic media with passwords and safely locked boxes.

**Ethical Consideration/Approval**

The Ghana Health Service Ethical Review Committee (GHS-ERC) has reviewed and approved this study with protocol identification number GHS-ERC071/02/18. The Ethical Review committee ensured that research participants are duly protected and safe from any possible harm and also ensure that their individual rights respected.

**Participant’s Consent Form**

I consent to voluntarily participate in this study because the foregoing information that I have read or has been read or translated to me in simple language that I understand and fully understood.

(Name and signature of a witness should be provided in a case where the participant cannot speak or read English)

Signature/thumbprint: .....

Name of witness: .....

Signature/thumbprint of witness: .....

**Interviewer's Statement**

I, the undersigned (your name), has fully explained information on the consent form to the participant in simple language terms that he or she understands. The objectives and purpose of the research, procedures, risks and benefits involved have been clarified to participants and have voluntarily agreed to take part.

Signature of interviewer .....

Date .....

Contact Address:

Telephone number: .....

Email address: .....

You can contact Miss Hannah Frimpong, the Administrator of Ethics Review Committee of GHS/ERC on 0243235225 / 0507041223 in case of any concern.

**Appendix B: Questionnaire**

**Questionnaire on Utilization of Intermittent Preventive Treatment during pregnancy in the Awutu Senya East Municipality: A study at the Kasoa Polyclinic**

Serial No.....

This questionnaire is to collect data on **Utilization of Intermittent Preventive Treatment during pregnancy in the Awutu Senya East Municipality**. I was grateful if you could make time to complete it. All information gathered was strictly held in absolute confidence.

Thank you

Date: ...../...../2018

Interviewer.....

Please fill in the blanks and mark (√) unless otherwise indicated.

**SECTION 1: SOCIO-DEMOGRAPHIC DATA**

1. Age            [1] 15-24            [2]. 25-34            [3] 35-44            [4]. 45 and above

2. Educational level:

[1] None    [2]. Primary            [3]. JHS            [4]. Secondary            [5].Tertiary

3. Employment status:            [1] Unemployed            [2]. Employed

4. Occupation.....

5. What is your monthly income?

[1] Less than GH C300            [2]. GH C300 - GHC500            [3]. Above GHC500

6. Marital status: [1] Unmarried [2]. Married [3]. Co-habitation
7. Religion: [1] Christianity [2]. Islamic [3]. Traditional [4]. Others (specify).....
8. Ethnicity: [1] Akan [ ] [2]. Ewe [3].Ga [4]. Fante [5]. Others (specify).....
9. Place of Residence: [1] Rural setting [2]. Urban setting
10. The number of pregnancy [1] First [2]. Second [3]. Three or more
11. The number of children.....

**SECTION [2]: utilization of intermittent preventive treatment during pregnancy (IPTp)**

12. Did you receive any medication for malaria treatment during your recent pregnancy?

[0] No [1] Yes [2]. Don't know

13. Have you heard about the intermittent preventive treatment of malaria before?

[0] No [1] Yes

14. If YES to Q13, where did you hear it?

[1] Radio/TV [2]. Health facility [3]. Friends [4]. Posters/Banners/Newspaper

15. Did you receive sulfadoxine-pyrimethamine (SP) during your last pregnancy?

[0] No [1] Yes.

If No. Give reason.....

16. If YES to Q15, how many doses of SP did you receive? Tick all that apply

[1] 1 dose [2] 2 doses [3] 3 doses

[4] 4 doses [5] 5 dose [6] 5+ doses

17. At what weeks of pregnancy did you receive the 1<sup>st</sup> dose of SP? .....

18. At what weeks of pregnancy did you receive the last dose of SP? .....

19. What is sulfadoxine-pyrimethamine (SP) used for?

[1] Prevent malaria in pregnancy

[2]. Prevent a headache

[3]. Prevent menstrual pains

[4]. Give appetite

20. At what monthly interval is SP given?

[1] Monthly after receiving 1<sup>st</sup> dose [2] 2 months after receiving 1<sup>st</sup> dose

[3] 3 months and above after receiving 1<sup>st</sup> dose [4] don't know

21. Did you take the SP under the supervision of the health staff?

[0] No [1] Yes

If No. Give reason.....

22. Were you provided with water at the health facility to take the SP?

[0] No [1] Yes. If No. Give reason.....

**SECTION [3]: FACTORS ASSOCIATED WITH UTILIZATION OF IPTp-SP**

23. Do you have a valid National Health Insurance Scheme (NHIS) card?

[0] No [1] Yes. If No. Give reason.....

24. The cost of transportation from home to the health facility is expensive?

[0] No [1]. Yes

25. If YES to Q 24, how much do you spend to get to the health facility? .....

26. How will you describe the distance from your home to the health facility?

[1] Very Far [2]. Far [3]. Not far

27. Road network to the health facility is good.

[0] No [1] Yes

28. How many weeks was your pregnancy before the first ANC visit? .....

29. How many ANC visits were made before delivery?

[1] None [2]. Once [3]. Twice [4]. Three times [5] Four times and above

30. How will you describe the attitude of health staffs?

[1] Very good [2]. Good [3]. Poor

31. was SP available at the health facility?

[0] Always available [1] Not Always Available

32. How long did it last before you started receiving SP again?

[1] Less than 2 weeks [2]. 3-4 weeks [3]. Above 4 weeks

33. Did you at any point pay for SP received at the health facility?

[0] No [1] Yes if Yes why? .....

34. Taken SP can protect the pregnant woman and the unborn child from malaria infection.

[0] No      [1] Yes    [2] Don't know

35. If No to Q34, Give reason .....

36. Did you experience any side effects from taken SP?

[0] No      [1] Yes

37. If YES to Q36, Tick all the side effect that you experienced

[1] Vomiting      [2] Skin rash      [3] Feeling weak, tired and dizzy

[4] Headache      [5] Loss of appetite      [6] Nausea      [7] Diarrhea

38. Waiting time during ANC visits at the health facility is too long?

[0] No      [1] Yes

39. If Yes to Q 38, how many hours do you spend during each visit?

[1] Less than 1 hour    [2] 1 to 2 hours    [3] 3 hours and more