

**SCHOOL OF PUBLIC HEALTH
COLLEGE OF HEALTH SCIENCES
UNIVERSITY OF GHANA, LEGON**



**FACTORS INFLUENCING UPTAKE OF INTERMITTENT
PREVENTIVE TREATMENT OF MALARIA IN PREGNANCY
USING SULPHADOXINE PYRIMETHAMINE IN THE
SUNYANI MUNICIPALITY, GHANA**

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DECLARATION

I, Hajira Ibrahim hereby declare that apart from the references made to other people's work which have been duly acknowledged, this work is the result of my own research work done under supervision and that this dissertation has neither in whole nor part been presented to the University or elsewhere for another degree.

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DEDICATION

I dedicate this work to Khalil Ayarika Atibila Issah.



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My gratitude first goes to God Almighty for giving me life, strength and courage to complete this work.

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LIST OF ABBREVIATIONS

ACT	Artemisinin based Combination Therapy
ANC	Antenatal Clinic
ASAQ	Artesunate-Amodiaquine
DHIMS 2	District Health Information Management Systems Two
DHMT	District health Management team
DOT	Directly Observed Therapy
DHS	Demographic and Health Survey
GHS	Ghana Health Service
IPT	Intermittent Preventive Treatment of malaria
IPTp	Intermittent Preventive Treatment of malaria in pregnancy
IRS	Indoor Residual Spraying
ITN	Insecticide Treated Net
LLIN	Long Lasting Insecticide Nets
MDG	Millennium Development Goal
MICS	Multiple Indicator Cluster Survey
MiP	Malaria in Pregnancy
NHIS	National Health Insurance Scheme
NMCP	National Malaria Control Program
OPD	Out Patient's Department
PMI	President's Malaria Initiative
RBM	Roll Back Malaria
RCH	Reproductive and Child Health
SP	Sulphadoxine- Pyrimethamine
WHO	World Health Organization

DEFINITION OF TERMS

Uptake of IPTp: The accessibility and administration of Sulphadoxine-Pyrimethamine tablets to pregnant women at antenatal clinics under the direct observation of trained health care providers. The administration of this medication starting 16 weeks gestation and the dosage is repeated at intervals of four weeks till delivery. It is expected that each pregnant woman would have received at least two doses of SP during each pregnancy.

Coverage: The percentage of pregnant women who received either one, two, three or more doses of SP by Directly Observed Therapy among all pregnant women in the district who will be visiting the ANC.

DOT: The direct observation of a pregnant woman by a qualified health staff as she swallows Sulphadoxine-Pyrimethamine (SP) at the antenatal clinic (ANC).

IPTp: The administration of anti-malarial drugs in treatment doses at predefined intervals to clear a presumed burden of parasites in pregnant women.

IPT1 coverage: The percentage number of respondents who received at least one dose of SP during their most recent pregnancy.

IPT2 coverage: The percentage number of respondents who received at least two doses of SP during their most recent pregnancy.

IPT3 coverage: The percentage number of respondents who received three doses of SP during their most recent pregnancy.

Sub Optimal Dose: the proportion of respondents receiving at most two doses of SP during recent pregnancy

Optimal dose of SP: the proportion of respondents who took at least three doses of SP during recent pregnancy.

ABSTRACT

Introduction

Ghana adopted a new Intermittent Preventive Treatment (IPT) of malaria in pregnancy policy in 2004, thus, from use of weekly Chloroquine chemoprophylaxis to use of Sulphadoxine-Pyrimethamine (SP) at intervals of four weeks as IPT for malaria in pregnancy. Despite its full implementation, the coverage still remains below the set target of 100% of at least IPT2. This study sought factors affecting IPT-SP uptake among pregnant women in the Sunyani Municipality

Methodology

This was a cross sectional study of 400 pregnant women attending services in 5 major Ante natal clinics in Sunyani from May to June 2015. Structured questionnaires were used to collect data on pregnant women's socio demographic, knowledge of IPTp and malaria in pregnancy, and perceived staff attitude. In-depth interviews were conducted on service providers. Thematic presentations were used for manual analysis of qualitative data after tape recording and transcription. Quantitative data was analysed using Stata12. Categorical variables were presented as frequencies while factors were assessed using logistic regression and presented as odds ratios with 95% confidence intervals.

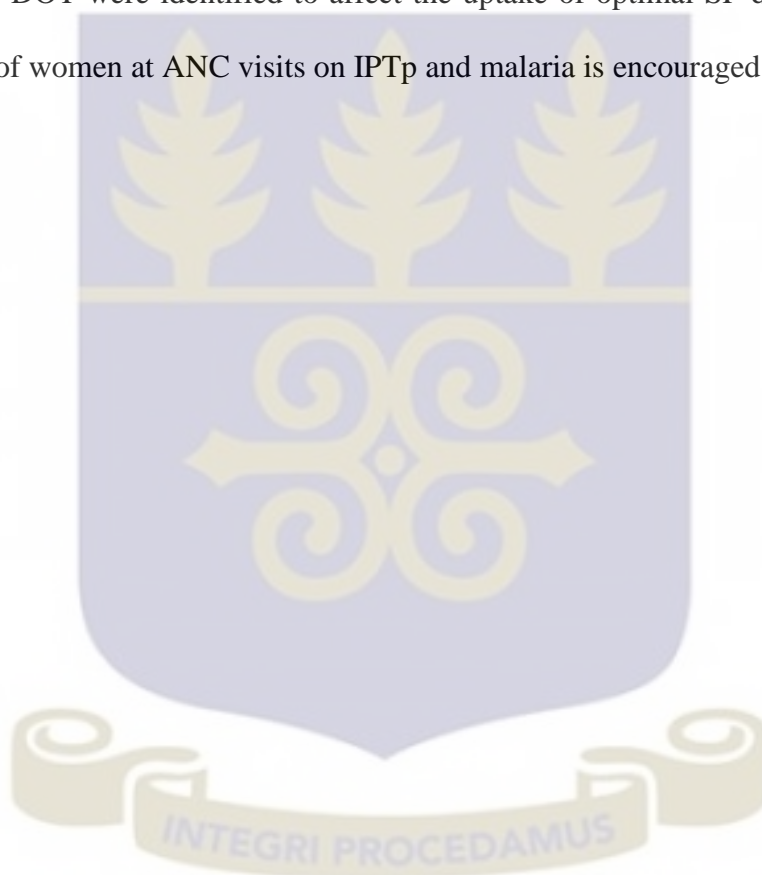
Results

A total of 400 pregnant women at 36 weeks or more gestational age were studied. The mean age of women was 29.1 ± 4.9 (range 16 -44) years. IPTp-SP was ever received by 98.5% of the pregnant women during the current pregnancy with 71% receiving optimal IPTp-SP doses at the time of study. Number of visits [aOR=4.7 (95% CI 1.31-17.2)], knowledge of IPTp [aOR=1.8 (95% CI 1.2-2.9)] and knowledge of malaria in

pregnancy [aOR=2.2 (95% CI1.1-4.6)] were significantly associated with SP IPTp uptake.

Conclusion

There is good level of uptake of IPTp-SP in the Sunyani Municipality. Pregnant women's knowledge of malaria in pregnancy and IPTp significantly influenced the uptake of IPTp in Sunyani. Staff attitude, availability of water and SP at ANCs and practice of DOT were identified to affect the uptake of optimal SP doses. Continuous education of women at ANC visits on IPTp and malaria is encouraged.



CHAPTER ONE

INTRODUCTION

1.1 Background

Malaria is an enormous international health problem affecting mainly young children, pregnant women and adults with little or no immunity. It is a mosquito-borne disease caused by the plasmodium parasite. People with malaria often experience fever, chills, and flu-like illness. If left untreated, they may develop severe complications and die (CDC, 2010). It accounts for over 10,000 maternal and 20,000 neonatal deaths globally. Over 25 million pregnant women are at risk of the infection each year worldwide. Malaria in pregnancy may result in maternal and foetal anaemia, prematurity, stillbirths rarely congenital malaria as well low birth weight which is the single greatest risk factor for neonatal deaths (Ministry of Health, 2008; World Health Organization, 2012b; Museveni,2009).

More than 30 million women in Africa become pregnant in malaria endemic areas and are at risk of *Plasmodium Falciparum* malaria infection compared to non-pregnant women. Yet only a fraction of these women have access to effective anti-malaria interventions (WHO, 2011). The susceptibility of pregnant women to *Plasmodium Falciparum* malaria increases the risk of disease and a high incidence of death for both the mother and her foetus (WHO 2009). Plasmodium Falciparum infection during pregnancy is estimated to cause as many as 10,000 maternal deaths each year, about 8 to 14% of all low birth weight babies, and about 3 to 8% of all infant deaths (Ministry of Health,2005).

Malaria in pregnancy may occur in several episodes, depending on a woman's exposure to mosquitoes, her level of immunity and possible co-infections such as other malaria species, HIV or helminths, as well as the efficacy of treatment and preventive

interventions available to her (De Beaudrap et al., 2013). Even though adult women in malaria endemic areas have a high level of immunity, this generally is impaired during pregnancy (especially in the first pregnancy, thereby increasing their risk of infection (Roll Back Malaria, 2005). This increased risk have also been attributed to the immunological, hormonal and physiological changes in pregnancy (Takem & D'Alessandro 2013). The reduced immunity may result in the risk of acute and severe clinical disease as well as more frequent episodes (WHO, 2011). In addition, adolescent pregnancies, sickle cell anaemia and HIV/AIDS co-infection also increases the susceptibility of a woman to Malaria during pregnancy (Ministry of Health, 2006). Even though Malaria in pregnancy may sometimes be asymptomatic, it can still affect the health of a woman and that of her unborn child. In Ghana, asymptomatic malaria accounts for 28.1% of OPD attendance, 13.7% of admissions and 9.0% of maternal deaths (MOH, 2009).

Following the recommendation of the World Health Organization in 2000, Ghana adopted a new malaria treatment policy in 2004. The country thus moved from the use of mono-therapy to combination therapy using Artemisinin-Based Combination Therapy. As part of this policy was the change from use of weekly Chloroquine Chemoprophylaxis to Sulphadoxine-Pyrimethamine (SP) as IPT for malaria prevention during pregnancy. This was based on growing concerns of resistance to Chloroquine and the fact that only 11.6% were adhering to the policy of using Chloroquine as IPT (Ministry of Health, 2008). The new policy of IPTp-SP was piloted in 20 selected districts of Ghana and by 2005 scaled up to a nationwide coverage (Ministry of Health, 2008). A revision of the policy was done in 2007 and the revised current policy was formulated in 2012 (Ministry of Health, 2014).

According to the policy, IPT was to be implemented as part of a multi-pronged approach as recommended by WHO to reduce the burden of malaria in pregnancy. These approaches consist of three tenets; which include the use of SP as IPTp, Insecticide Treated Nets (ITN) and case management of malaria illness. A clinic-based prevention approach was adopted (National Malaria Control Programme, 2007) as over 90% of the target (pregnant women) attend antenatal clinic at least once during pregnancy (Ghana Health Service, 2011; WHO, 2011)

IPT of malaria in pregnancy is based on the assumption that every pregnant woman living in areas of high malaria transmission has malaria parasites in her blood or placenta, whether or not she has symptoms of malaria. It involves the administration of full, curative treatment doses of SP in at least monthly intervals during pregnancy with the first dose administered as early as possible in the second trimester and the last dose administered up to the time of delivery (World Health Organization, 2012a). The potential of IPT to achieve great levels of programme coverage due to high level of acceptability by women and its benefits in reducing malaria in pregnancy which causes maternal anaemia and Low Birth Weight (LBW) makes it a preferred strategy (Ministry of Health, 2006). Based on efficacy and safety profile, SP has been the only drug recommended for IPTp for all areas of moderate to high transmission of malaria (Roll Back Malaria Partnership, 2014).

The study therefore sought the factors that influence uptake of Intermittent Preventive Treatment of Malaria in Pregnancy using SP among pregnant women in Sunyani.

1.2 Statement of research problem

One major cause of morbidity and mortality among pregnant women and young children is malaria and it is endemic in more than 100 countries with about half of the world's population at risk (The Henry J. Kaiser Family Foundation, 2013).

Each year, nearly 50 million pregnant women are exposed to malaria and about 10,000 mothers with 200,000 of their infants die as a result of malaria in pregnancy (WHO, 2011). Malaria in pregnancy contributes to high morbidity; up to 15% maternal anaemia 14% of low birth weight infants; 36% of preterm births; 70% of intrauterine growth restriction; 8% of infant death and 15% of maternal anaemia (WHO, 2011). Apart from the health consequences, malaria puts a heavy burden on productivity and hence economic development. It is estimated to cause reduced economic growth of over 1.2 % of GDP on endemic countries globally and cost Africa's economy about \$12 billion annually (Ministry of Health, 2014).

In Ghana, malaria is estimated to cause the loss of about 10.6% Disability Adjusted Life Years (DALYs) costing an equivalent of about 6% of GDP annually in economic burden (Ministry of Health, 2009). Among pregnant women in Ghana, malaria accounts for about 14% of OPD attendance, 11% of admissions and 9% of deaths (Ministry of Health, 2005). According to the Ministry of Health (2014), as many as 16.8% of all admissions of pregnant women in 2011 were attributed to malaria; causing about 3.4% of deaths among them.

Data from the Ghana Health Service District Health Information Management System Two (DHIMS2) suggests that, malaria in pregnancy accounted for about 15% and 16% of inpatient admissions in the Brong Ahafo Region in the year 2012 and 2013 respectively. On the other hand, the Brong Ahafo Regional Annual Report (2013)

documents a continuous decline in the trend of malaria in pregnancy; from 28.6% in 2011 to 18.7% in 2012 and 16.1% in 2013 respectively. Both documentations, suggest a decline in the incidence of Malaria in Pregnancy.

According to the Ghana Health Service (2011), in 2010, 545,032 (69.4%) pregnant women received IPT1 with 418,684 (53.3%) and 283,682 (36.1%) receiving IPT2 and IPT3 respectively nationwide. Data from the GHS (2015) illustrates a decline in coverage from 2012 to 2013; 69.8% to 61.2% IPT1; 57.8% to 51.0% IPT2 and; 41.4% to 37.1% IPT3. In the Brong Ahafo region, there was a decline in coverage from 78.6% to 68.5% IPT1; 66.9% to 50.3% IPT2 and; 48.9% to 45.3% IPT3, for 2012 and 2013 respectively (GHS, 2015). The Sunyani Municipal Health Services Annual Report (2013) showed a decreasing trend of IPT coverage form 72% IPT1, 67% IPT2 and 51% IPT3 in 2012 to 66% IPT1, 63% IPT2 and 50% IPT3 in 2012. Even though IPTp policy has been adopted by many endemic countries, there still exists operational and implementation challenges which may be attributed to poor drug supply, poor practices of health workers, low and late attendance of clients to antenatal clinics, inadequate staffing as well as negative perceptions of IPTp (Sangare et al, 2010).

Ghana's current coverage of IPT2 (51%) in 2013 is even below the 85% target set for 2011 which makes the 100% IPT2 set for 2015 highly improbable. Every pregnant woman is expected to receive at least two doses of SP under Directly Observed Therapy (DOT) (Ministry of Health, 2008).

It is worth noting that the performance of IPT in the Brong Ahafo Region and Sunyani is quite better than that of the national coverage. In addition, even though the trend of IPT coverage is declining, the incidence of malaria in pregnancy is as well declining.

This decline could be yet due to undiscovered factors or possibly the effects of other malaria control intervention in the Brong Ahafo Region.

The decreasing trends of IPT as illustrated above might be due to a number of factors that influence the implementation of IPT and the uptake of SP by pregnant women. This study therefore sought the factors that affect the uptake of IPT-SP. In addition the study made recommendations to help improve SP uptake in the Sunyani Municipality.

1.3 Conceptual Framework

Conceptually, the research looked at the factors that could contribute to the uptake of IPT-SP in the Sunyani Municipal.

The health seeking behaviours of the respondents may be influenced by some socio-demographic factors such as; age, place of residence, marital status, parity, educational status as well as occupation. These factors are likely to affect ANC attendance and access to ANC services which may intend affect SP uptake. Gestational age at first ANC will also affect the number of visits and hence SP uptake.

A good knowledge of the cause and effects of malaria in pregnancy will improve knowledge and uptake of IPT by pregnant women. Clients Knowledge of IPT will encourage them to utilize services and hence complete IPT regime. The availability of SP and water in the facilities at all times will ensure the practice of DOT which will influence SP uptake and further ensure that there are no interruptions in the program.

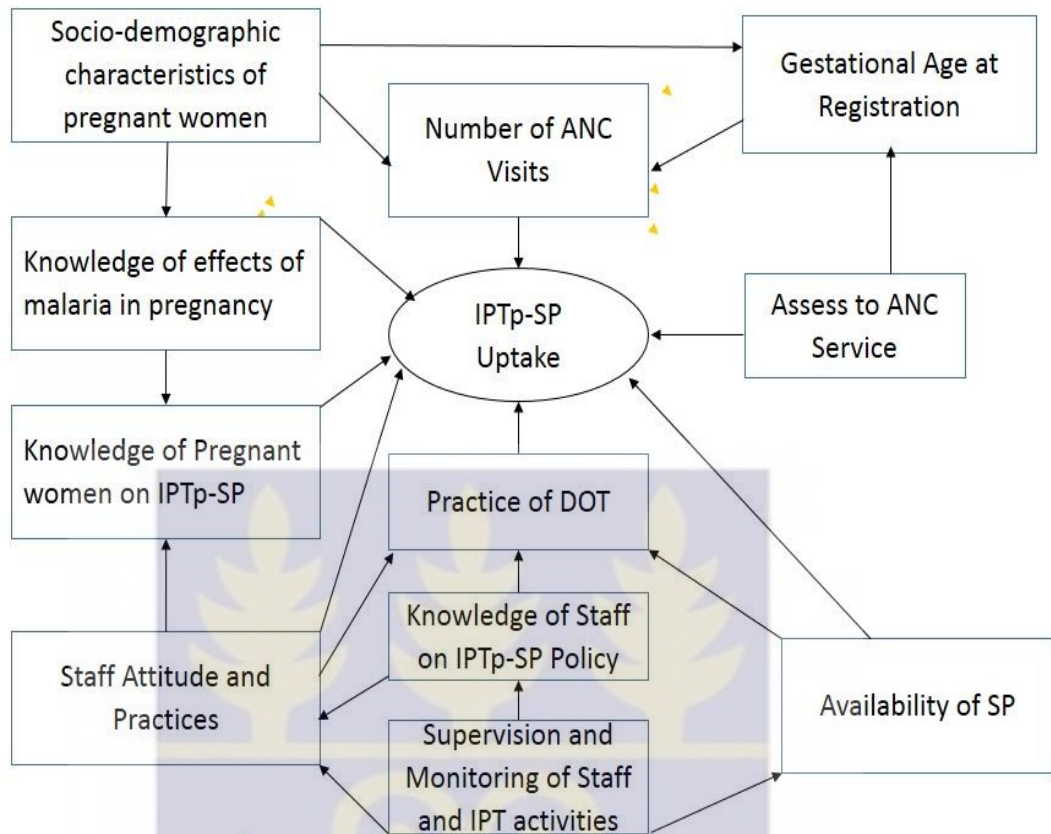


Figure 1: Conceptual Framework adapted from Antwi (2010)

1.4 Justification of Study

Prevention of malaria in pregnancy is one of the key interventions in the fight against maternal and infant morbidity and mortality (Roll Back Malaria, 2008) with the aim of contributing to achieving Millennium Development Goal (MDG) 4, 5 and 6.

Despite the full implementation of IPTp-SP as a policy in Ghana about ten years ago, low uptake among pregnant women still remains a challenge nationwide and in the Brong Ahafo Region. There have not been any documented studies specifically in any part of the Brong Ahafo Region to identify the factors accounting for this low uptake.

The search for the reasons for this low uptake of IPT necessitates a study into the factors affecting IPTp utilization among pregnant women in Sunyani. This study was therefore to contribute to the identification of client related factors and service delivery

factors that influence IPT p-SP uptake in Sunyani. The findings from the study can be used by the Sunyani Municipal Health Directorate as well as districts with similar situations to improve upon the IPTp program in the districts.

1.5 Research Questions

- 1) What is the level of uptake of IPTp-SP among pregnant women (36weeks and above) in Sunyani?
- 2) What are the client related factors that affect the uptake of IPTp-SP among pregnant women Sunyani?
- 3) What are the service delivery factors that affect the uptake of IPTp-SP among pregnant women Sunyani?

1.6 Objectives of the study

1.6.1 General Objective

The general objective of the study is to determine the factors that affect the uptake of Intermittent Preventive Treatment of Malaria in Pregnancy (IPTp) using SP in Sunyani.

1.6.2 Specific Objectives

The specific objectives are to;

- Determine the level of uptake of IPTp-SP among pregnant women of 36 weeks and above gestation in Sunyani
- Identify the client related factors that affect the uptake of IPTp-SP among pregnant women in Sunyani
- Identify the service delivery factors that affect IPTp-SP uptake among pregnant women Sunyani

CHAPTER TWO

LITERATURE REVIEW

2.1 National Drug Policy for Malaria Control in Ghana

In response to the World Health Organisation (WHO) recommendation, the Ghana National Malaria Control Programme (NMCP) and the Reproductive and Child Health (RCH) Unit with support from partners developed strategies for the implementation of IPTp using SP (NMCP, 2007). The objective of the strategy is to reduce malaria related maternal and perinatal morbidity and mortality. It is to specifically reduce malaria episodes among pregnant women attending ANC; to contribute to the reduction of maternal anaemia amongst pregnant women attending ANC; and to contribute to the reduction of low birth weight babies among pregnant women attending ANC (NMCP, 2007). The strategy is clinic based as over 90% of pregnant women in Ghana attend at least once.

The components of the strategies of IPTp-SP implementation include: integrating IPT with other interventional measures such as ITN use, Iron and folate supplementation, deworming and active case management of malaria; increasing the awareness about the integration for the prevention and control of malaria in pregnancy at all levels; ensuring that all health facilities and staff in the country are fully equipped to provide IPT with SP according to national guidelines; regularly assessing the efficacy of the drugs used for IPTp and regularly assessing the effectiveness of IPTp including monitoring of side effects.

2.2 Prevention of Malaria in Pregnancy

Pregnant women in malaria endemic areas are recommended to take at least two doses of SP as IPT (WHO, 2003). Following this recommendation, many countries including

Ghana adopted the policy of using SP as IPTp. The Ghana policy requires that, every pregnant woman have access to insecticide treated nets (ITNs) in addition to IPTp-SP which should be used throughout the pregnancy as an additional method of malaria prevention.

The original Abuja target for reducing malaria in Africa and for IPT and ITN use among pregnant women was 60% by 2005 and was revised to 80% by 2010. Currently, the target for IPT and ITN use among pregnant women is 100% by 2015 (Roll Back Malaria Partnership, 2014). As part of attaining this target Ghana changed its policy on malaria prophylaxis during pregnancy. This requires pregnant women to receive SP as IPT under DOT (MOH, 2009).

2.3.1 Intermittent Preventive Treatment (IPT) of Malaria in Pregnancy

Administration of SP is recommended as early as possible in the second trimester at a regular interval of at least one month (World Health Organization, 2012).

The timing and interval for IPTp uptake is important. In the first trimester of pregnancy, fetal growth velocity is comparatively slow but increases quickly in the second and third trimesters. It is therefore significant to ensure that the placenta is free of malaria parasites when fetal growth velocity is fastest. The presence of parasites in the placenta interferes with the transfer of nutrients to the fetus (WHO, 2002).

SP is inexpensive and its administration at least twice in pregnancy has been found to; reduce maternal anaemia (Haemoglobin less than 8g/dl) by 39% (Shulman et al.,1999); reduce placental malaria by 56% and reduce low birth weight by 43% (Parise et al., 1998).

2.3.2 IPT-SP coverage

Even though 36 countries in Sub-Saharan Africa had by the year 2012 endorsed IPTp as part of antenatal care, coverage has remained a challenge. Only a few countries had data on IPTp-SP coverage available and this data which was provided to the WHO showed 64% of pregnant women attending antenatal care had received at least one dose of intermittent preventive treatment during pregnancy in 2012. The data further indicated that only 23% of them had received three doses (World Health Organization, 2013).

In East Africa, Nyonyi (2012) reported that 90% of pregnant women in Dar Es Salaam Health facilities received at least one dose of IPTp-SP with 79.5% receiving the second dose. In Jinja, Uganda less than one-third of women received a full-course of IPTp- SP despite the high utilization of ANC (94.2%). While IPTp-SP is a relatively simple intervention to administer, missed opportunities (women with at least two qualifying ANC visits after the first trimester who had the opportunity to receive a complete course of IPTp but did not) were found to be common in the study (Sangaré et al., 2010). In a study on determinants of IPTp utilization in rural areas, Amoran, Ariba, & Iyaniwura (2012), found a low IPTp utilization among pregnant women; 40.4% IPT use with only 14.6% IPT2.

To determine the coverage of IPT in Ghana, one survey found that 62% of pregnant women who visited health facilities in Ghana were documented to have received IPTp1, 38.1% IPTp2, and 36.3 % IPTp3 (Ministry of Health, 2008). Additional documentation from the Ghana Demographic and Health survey (GDHS, 2008) indicated that more than 58% of pregnant women took at least one dose of SP as IPTp with about 44% taking two doses (GSS & Macro, 2009). The Ghana Multiple Indicator

Cluster Survey for 2011 reported that 97% of pregnant women in the Brong Ahafo Region attended ANC at least once with only about 79% and 62% taking IPT1 and IPT2 respectively (Ghana Statistical Service, 2011).

Antwi (2010) reported 95% coverage for IPT1 which declined to 77% for IPT2 and 44% for IPT3 respectively in a study in the Bosomtwe district of Ashanti. The above figures show that, Ghana has a long way to go to reach the 100% target for IPT2. Improvements of IPT2 and IPT3 coverage have however been made a priority for the Ghana National Malaria Control Programme.

2.4 Factors Influencing IPTp uptake.

2.4.1 Gestational age of mothers at ANC registration

A delay in initiating ANC will reduce the number of times a woman can receive IPT prior to term. The timing of the number of doses to be taken is directly tied to when a woman starts her ANC visits. Exavery et al., (2014), found in their study that, timing of ANC initiation is significantly important in determining the extent of IPTp-SP uptake among pregnant women in Tanzania. They reported that, an optimal uptake of number of doses (two or more doses) of IPTp-SP was higher (46%) among pregnant women who initiated ANC in the first trimester of pregnancy and lower (36.5%) among those who initiated ANC in the third trimester. Anchang-Kimbi et al., (2014) reported a significantly higher proportion of women (62%) with first ANC in the third trimester receiving only one SP dose compared to those who had their first ANC visit in the first and second trimesters. In addition, those who booked early at ANC were more likely to receive the recommended two or more SP doses. In Kisumu, Kenya, it was reported that, late first ANC attendance was the most important factor contributing to incomplete IPT uptake. The study presented that 45% of the women started ANC in

their third trimesters which resulted in low IPT uptake of 23.7% IPT1, 43.4% IPT2 and 32.9% of them receiving no IPT dose at all prior to delivery (Van et al. 2004).

A study in Tanzania reported that a large proportion of pregnant women attended the clinics at or earlier than 16 weeks gestation and were required to wait until at a later visit to receive SP (Anders, Marchant, Chambo, Mapunda, & Reyburn, 2008). The wait till after 16 weeks to receive SP was probably in line with policy where the women can only receive SP only at gestation of 16 weeks or more. This wait in receiving SP reduces the benefits of the treatment and risk the possibility of them not returning for the second visit at the scheduled time.

2.4.2 Knowledge of Pregnant Women about Intermittent Preventive Treatment and Malaria in Pregnancy

The best source of knowledge for pregnant women about IPTp is through Antenatal Clinics where health workers are supposed to educate them. A pregnant woman's knowledge about IPTp will inform her about the need to attend antenatal regularly to enable her receive SP, hence improve IPT intake. In 2004, Nganda, Drakeley, Reyburn, & Marchant found that pregnant women knowledge about malaria influenced the use of ITNs but not SP.

A major determinant of use of IPT was found to be the knowledge about the prophylaxis. Hence, uptake of IPT can be significantly improved if backed with health education on the complications of malaria in pregnancy and benefits of taking IPT-SP (Amoran et al., 2012). In South East Nigeria, Akinleye, Falade, & Ajayi (2009) reported that IPT awareness was among more than half of pregnant women but only a few (23.9%) had adequate Knowledge of the drug. IPT-SP use was found to be 27.3% of 209 respondents and this was among those who were aware.

According to Antwi (2010), there is an association between the knowledge of pregnant women about IPTp-SP and the number of doses received. It is probable that knowledge about the benefits of IPT-SP encourages pregnant women to make efforts to attend ANC and with that receive the required number of doses. Low levels of information (21%) and knowledge (31.5%) of IPT was reported among pregnant women interviewed in Kampala by Nankwanga & Gorette (2008). This resulted in low coverage of IPT1 (61%) and IPT2 (31.5%) among these women as only 4.5 % of them knew the recommended dosage (Nankwanga and Gorette, 2008). This is in contrast to the findings of the study in South East Nigeria stated above. The finding of this study indicates the need to strengthen health education at the facilities to help improve IPTp uptake.

A good knowledge of the cause of malaria and its importance as a health risk during pregnancy among pregnant women was also reported by Enato, Okhamafe, & Okpere (2007). However, the knowledge about the consequences of malaria for both mother and her foetus was found to be poor. This finding indeed may have a very serious implication, as it is likely to impede the utilisation of anti-malarial interventions by the pregnant women. Enato et al (2007) additionally suggest that a low respondents' belief in the effectiveness of ITNs and IPT as malaria preventive measures during pregnancy led to a low utilisation of these interventions, despite the availability of clear policy on the use of ITNs and SP based IPT in pregnancy in Nigeria.

Contrary to the findings of Enato et al. (2007), Chepkemai Ng'etich Mutulei (2013) found a very good knowledge of malaria in pregnancy and its effects. Most of the respondents perceived malaria infection during pregnancy as a very serious health risk which influenced their IPT uptake although this association was not statistically

significant. Other studies on knowledge about IPT have made assumptions that the knowledge of the timing for IPTp by a pregnant woman will influence her decision to frequent ANC and her IPTp-SP uptake. In East Africa, Tarimo (2007) reported an incomplete SP uptake due to inadequate knowledge about the timing of SP as well as a low perceived health benefit about the drug.

These findings suggest that, it is very critical that health education sessions at the clinics be intensified and pregnant women should be encouraged to attend these sessions. There should also be innovations of repeating the health education topics during the whole period of the ANC so that each person attending ANC gets to hear the messages no matter the time of attendance.

2.4.3 Access to ANC services

Antenatal care among pregnant women is essential in the fight against maternal morbidity and mortality, however, access and utilization is still a challenge due to a number of factors.

Attendance at health education sessions at the MCH clinic is the only determining factor for IPTp-SP use in Tanzania (Nganda et al., 2004). Since IPT-SP is delivered under direct observation of health workers at the ANC clinic it means access to IPT-SP can only be possible on condition that the pregnant woman attends ANC. There however are known barriers to utilization of ANC services and by extension IPT-SP under direct observation at the clinic. A study reported that more than 42% of the respondents lived about 8 kilometres away from the nearest health facility but 55.2% of all respondents (including those who lived less than 8 kilometres from the nearest health facility) complained that travel conditions made it difficult to visit the nearest health facilities (Ye, Yoshida, Harun-Or-Rashid, & Sakamoto 2010).

In 2013, Chepkemai Ng'etich Mutulei, reported that there is up to 99% chance that the uptake of IPTp was significantly associated with the distance covered to the nearest ANC facility Bugoma East District of Kenya. They found that those who had lesser distances to cover had a higher uptake of IPT-SP (Chepkemai Ng'etich Mutulei, 2013).

2.4.4 Number of ANC Visits

Olliaro et al., (2008) found that, the probability of having a second dose of SP was significantly related to the number of antenatal visits. For women seen three times or more, the benefit of an early first SP dose on having a second dose is seen earlier in pregnancy as the number of visits increases. Similarly, receipt of partial IPTp-SP doses was reported to be higher among women who received ANC less than four times than that observed among women who had sought ANC at least four times during pregnancy (39.9% against 47.6%) (Exavery et al., 2014).

In 2007, Brentlinger et al. (2007) also reported that less than half (43.6%) of pregnant women in their study received the full course of IPT due to infrequent ANC visits.

In Malawi, Holtz et al. (2004) found that even though ANC attendance was high (98.6%) among pregnant women, only a few (36.8%) received the recommended number of doses of SP (2 doses). In Cameroon, the proportion of women receiving the recommended 2 or 3 doses of IPTp-SP increased with the number of ANC visits attended (Anchang-Kimbi et al., 2014). Thus women who received one dose were more likely not to have attended four or more visits.

2.4.5 Staff Knowledge of IPTp-SP Policy

A qualitative study conducted in Gambia, showed that pregnant women relied on care providers for safe and timely administration of drugs, hence the need for good training

and close monitoring of health workers to reduce the risk of not treating pregnant women correctly (Brabinet *et al.*, 2009).

In Nigeria, Arulogun & Okereke (2012) found that, the practice of IPT was greatly influenced by staff knowledge of IPTp policy as those who were knowledgeable had a better practice. Onoka, Onwujekwe, Hanson, & Uzochukwu (2012) in their study reported high provider knowledge (94.1) of the existence of IPTp policy in Nigeria with only 14.7% satisfying all the four criteria for assessment of knowledge of the IPTp guidelines. The low IPTp coverage level of 13.7% and 7.3% for first and second doses, reported by the study may have resulted from the poor knowledge of staff on IPTp policy guidelines (Onoka *et al.*, 2012).

A study in rural western Kenya to assess the effect of health worker training on the use of IPT for malaria in pregnancy showed an increase in coverage from 19% in 2002 to 61% in 2005 for IPT1 and from 7% to 17% for IPT2 after health workers were retrained on IPTp in 2003 (Ouma *et al.*, 2005).

2.4.6 Availability of SP and Water

The availability of SP and water form a basis for IPTp-SP uptake among pregnant women. In East Africa, SP stock outs was reported in 92% of health facilities under the study and no services were provided on IPTp-SP during stock outs (Nyonyi, 2012). Similarly, Akinleye *et al.* (2009) reported periodic shortage of SP in rural health facilities of Southwest Nigeria which was a major barrier to the implementation of IPTp-SP programme. Stock outs due to non-availability of funds by government to purchase the drug is another factor that has negative impact on IPT uptake (Antwi, 2010). During this period, the options that were resorted to were either to suspend the IPTp until stocks were replenished, refer the women to other facilities or ask them to

buy the SP from the open market. The 2008 PMI survey in Ghana showed that IPTp is offered in 94.1% of the facilities, however stock outs occurred in 27% of these facilities. It was believed that the stock outs were related to challenges in supply chain management programs rather than a drug shortage at the central house (PMI, 2008).

In Mozambique, insufficient provincial stocks of SP for IPTp due the national formulary declaration of SP as contraindicated in pregnancy was reported by Brentlinger et al., 2007.

Studies in Tanzania and Western Nigeria also found stock outs as the cause of women not receiving IPT at antenatal clinics (Amoran et al. 2012; Tarimo, 2007).

From these findings, it can be deduced that SP stock outs is a serious barrier to a successful programme implementation. These findings suggest that, even though there may be a successful IPTp-SP programme implementation, stock outs of SP may have the potential of eroding a successful programme.

According to Nyonyi (2012), availability of water at the facility was not a challenge to providing SP in the facilities as pregnant women were encouraged to carry water during their ANC visits for DOT. Similarly, in Nigeria, Onoka et al. (2012) reported that the availability of water and SP was not a significant factor to the administration of SP at the facility as there existed cheap alternative sources of water . In Ghana, Antwi (2010) reported that water was always available either for free or on sale at the facilities to enable women swallow SP under supervision. This probably contributed to the high (95%) coverage of IPTp in the Bosomtwi district reported by the study. On the other hand, Hill et al. (2013a) in a meta-analysis found that the lack of drinking water and cups at the health facility was a major service delivery barrier to the practice of DOT and implementation of IPTp in Sub-Saharan Africa. Similarly, a study in Nigeria

revealed that a shared drinking cup and the concern of the quality of drinking water in the facility resulted in women opting to take medicine to swallow at home (Akinleye et al., 2009). It was not certain that the women would actually adhere to swallowing SP at home especially without supervision. If probably, the women were encouraged to carry their own cups or water for DOT, SP would have achieved a good coverage in these settings.

2.4.7 Attitude of Health Staff

Fear of the safety of the drug on the part of service providers can also negatively affect the uptake of IPT (Amoran et al. 2012).

In Kenya, a study found that there is 99% chance that IPTp uptake is significantly related to perceived attitudes of providers towards pregnant women attending ANC clinics. It also found that IPTp –SP uptake was high among women who perceived a positive provider attitude towards them and low among those who perceived a negative provider attitude (Chepkemai Ng'etich Mutulei, 2013). In the Bosomtwe district of Ghana, a study found that 99% of respondents were satisfied with provider attitude and were therefore encouraged to return for subsequent visits. This positively influenced SP uptake among the pregnant women as reported by the study (Antwi, 2010).

In a systematic review of health systems barrier to IPT coverage however, Thiam, Kimotho, & Gatonga (2013) found that lack of client- provider relationships is a human resource challenge hindering IPTp implementation.

2.4.8 Practice of DOT

In Uganda, the predominant factor predicting preventive use of SP during pregnancy was being offered IPTp in the clinic (Sangaré et al., 2010). However, studies suggest the poor practice of DOT in certain health facilities which affects IPTp-SP programme implementation. A study in Nigeria found that only 36.8% of those who took SP did so in the clinic with only 14.3% doing so under the supervision of a service provider. A common cup which was shared among these women was found to be a barrier to practice of DOT (Akinleye et al., 2009). Similarly, in the Rivers state of Nigeria, a study reported that only 16.4% of those who took SP as IPTp did so under DOT (Tobin-West & Asuquo, 2013). Further in Nigeria, a study reported a poor practice of DOT in both private and public facilities where 64.7% of providers reported giving SP to women to swallow at home. This has been as a result of perceived effects of taking drugs on an empty stomach. This poor practice of DOT resulted in the suboptimal uptake of SP in these facilities (Onoka et al., 2012). In Dar Es Salaam health facilities of East Africa, even though there was good uptake of IPTp (IPT1-90% and IPT2-87%), the practice of DOT was observed in only 56% of the facilities (Nyonyi, 2012). The poor practice of DOT in these facilities has proven to be a limiting factor in achieving the ultimate goal of the IPTp programme. As mentioned earlier, it is not certain that those who are given SP to be swallowed actually do so especially without the supervision of a health staff.

Contrary to these findings however, the practice of Directly Observed Therapy was also reported by Antwi (2010) in all ANCs in the Bosomtwe District with monitoring and supervision of the IPTp program also taking place.

CHAPTER THREE

METHODS

3.1 Study Type and Design

A facility-based descriptive cross sectional study was conducted in the Sunyani municipality between the month of January and June 2015 using both quantitative and qualitative methods.

The health facilities involved were: the Brong Ahafo Regional Hospital, Sunyani Municipal hospital, SDA hospital, Owusu Memorial Hospital and Monica Maternity home.

3.2 Background of the Study Area

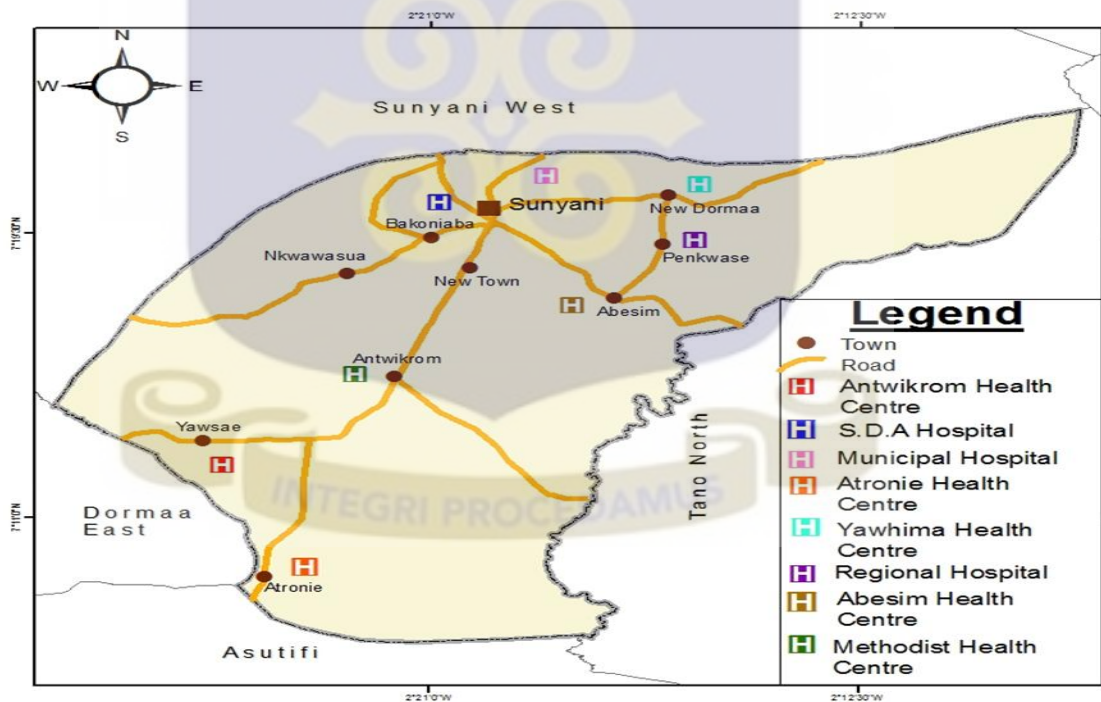


Figure 2: Map of Sunyani Municipal

Sunyani Municipal is one of the twenty-seven administrative districts in the Brong Ahafo Region of Ghana and one of the oldest districts of the region. Located in the heart of the Brong Ahafo Region, it has Sunyani (from which the municipality derives

its name) as its capital and at the same time as the regional capital. It borders Sunyani West District to the North, Dormaa East District to the West Asutifi District to the South and Tano North District to the East.

The current population of the municipality projected from the 2010 population census is 131,924 with a total of 32,716 being Women in the Fertile Age (WIFA). The number of expected pregnancies is 4,089 annually (Sunyani Municipal Annual Report, 2013). The municipality has a substantial portion of its population being students and staff of tertiary and other educational institutions. The predominant religions in the municipality just like in most parts of the Brong Ahafo region include Christianity, Islam and Traditional African worship.

There are a total of 53 health facilities in the municipality comprising; a Regional Hospital; a District hospital; 3 Health centres and; 22 functional CHPS zones operated by the Ghana Health Service. The other health facilities include 5 School Clinics; 13 Private Clinics; 3 quasi government facilities; 3 Private Maternity Homes; and 2 Christian Health Association of Ghana facilities.

The whole of municipality has access to potable water from the Tano River and several boreholes in households and in some health and educational facilities. The situation of sanitation is faced with challenges of access to toilet facilities in both public and domestic buildings.

The main economic activities include subsistence farming and trading though there is a high number of the people employed as public servants, or attending one of the over 20 or tertiary institutions of learning.

Antenatal care services are provided on a daily basis at the district and regional hospitals but on selected days at the health centres. The CHPS compounds on the other

hand provide close to client antenatal services during home visits to pregnant women in the communities.

3.3 Study Population

The study population for the quantitative component of the study were pregnant women of 36weeks gestational age and above who attended the facilities for ANC services. Midwives and nurses who provide antenatal services and a focal person for malaria control were the population for part of the qualitative arm of the study.

3.4 Study Variables

3.4.1 Dependent

IPTp-SP Uptake

3.4.2 Independent

1. Socio-demographic characteristics of pregnant women (Age, marital status, level of education, gestational age, parity, gestation age, occupation)
2. Number of ANC visits
3. Gestational age at first ANC
4. Respondents' knowledge of malaria in pregnancy and its effects
5. Knowledge of IPT
6. Practice of IPT in the facilities (DOTs)
7. Perceived attitude of staff
8. Availability of SP and water for DOT

3.5 Inclusion Criteria

- All pregnant women of 36weeks gestation and above irrespective of their IPT status and agree to participate in the study

- Midwives and Nurses providing maternal Health Services including IPT and have been working in the facility for a period of at least three years

3.6 Exclusion Criteria

1. Pregnant women who are below 36 weeks gestation
2. Nurses and midwives in the area of maternal health for a period less than 3 years which is a considerable period of practice
3. Pregnant women and health staff who refuse to give their consent to participate in the study

3.7 Sampling

3.7.1 Sampling Procedure

For the quantitative study participants were enrolled consecutively. This was done because the period of data collection was short (May to June 2015) and the sample size was large. Every pregnant woman of this gestation attending ANC at the time of data collection was invited to participate in the study after the study had been introduced to them. Those who consented to be part of the study were interviewed using structured questionnaires.

In order to obtain qualitative data the study sampled midwives who were managers of the antenatal clinics or were supervisors of the practice of DOT with SP and other antenatal services. The information on which health staff involved in IPT-SP services was obtained from the Municipal Director of Health Services. We then conducted in-depth interviews with staff that had more than three years of experience in the area of malaria control and antenatal care and were on duty at the time of data collection.

A non-participant observation approach was used to observe IPT activities in the facilities each day of the data collection period. The research team utilized checklists to

observe the interaction between the health staff and the pregnant women during the provision of services related to taking SP under direct observation.

Due to the large number of respondents needed for the study we selected facilities which rendered a wider range of antenatal services and attracted most pregnant women. In comparison the smaller facilities like CHPS compounds were not chosen due to limited services as described by the Municipal Director of Health Services.

3.7.2 Sample Size

A total of 400 pregnant women were included in the study. This was estimated using an expected IPT3 prevalence of 50% in the Sunyani Municipality. This sample had a margin of error of 5%, and confidence interval of 95%. This was calculated using the following formula;

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

Where: n = the minimum required sample size.

z = standard normal deviation corresponding to 95% confidence interval, which equals to 1.96.

P= proportion of pregnant women who received IPT3 taken to be 50% (GHS DHIMS2, 2013)

E = the margin of error on P estimated to be at 5%

Therefore:

$$n = \frac{1.96^2(0.5)(1 - 0.5)}{(0.05)^2}$$

n = **384**

Adjusting for 10% of non-response rate, a total 422 participants were required for the quantitative study. In addition to this 5 midwives and a malaria control focal person were selected and interviewed as Key Informants.

3.8 Data Collection Techniques

Data collection techniques employed included records review using an observation checklist, interviews using structured questionnaire and Key informant Interview using an interview guide. Quantitative data was obtained from respondents using structured questionnaires whilst question guide was used to obtain qualitative data during in-depth interviews with key Informants.

The dependent variable for which data was collected was IPTp-SP uptake whilst the independent variables were socio-demographic characteristics (Age, education, occupation, parity and marital status); knowledge of IPTp-SP; gestational age at registration; number of ANC visits; knowledge of effects of malaria in pregnancy; perceived staff attitude and practices and; availability of SP and water. The clients' medical record was reviewed from the clients ANC record books using a checklist and data on direct non-participant observation of IPT-SP service delivery collected using another checklist.

3.8.1 Data collection tools

3.8.1.1 Questionnaires

Pre-coded Structured interviewer-administered questionnaires adopted and modified from Antwi (2010) was used to collect quantitative data from pregnant women. Data was collected on; socio-demographic characteristics of pregnant women (age, marital status, level of education, gestational age, gravida, parity, gestation age, occupation and

location), respondents' knowledge of malaria in pregnancy and its effects as well as knowledge of IPT, practice of IPT in the facilities and perceived attitude of staff.

3.8.1.2 Interview guides

In-depth interviewer guides were used to collect qualitative data on some policy issues on IPT, implementation challenges and recommendations to address these challenges from the perspective of service providers on a personal face to face basis. Personal face-to-face interviews were chosen over self-administered questionnaires to ensure uniformity in the understanding of the questions. Its nature of open-ended questioning was more tolerated due to the fact that the respondents were more convenient at expressing their long answers orally than in writing.

3.8.1.3 Observational Check List

A standardized check-list was used to observe activities including planned health education talks, practice of DOT, recording of DOT in the ANC records books and registers, availability of SP and water for DOT among others.

3.9 Pre-testing of Data Collection Tools

As part of quality control discussed below the data collection tools were pre-tested in the Sunyani West District which was not part of the study. The pre-test of tools enabled the research team to identify problems and to make modifications where necessary for ease of data collection in line with study objectives.

3.10 Quality control

To facilitate in data collection, 5 research assistants were employed to help in the process. They were trained on how to use the data collection tools and what data will be collected.

The principal researcher supervised the data collection and also checked for completeness and correctness of the data collected. Data entry was done on daily basis after the day's work. Daily review of the collection was done and problems emerging were immediately addressed.

3.11 Data handling

Questionnaires were pre-coded prior to data collection exercise. The collected data was validated, cleaned and manually entered into Epi Info 7 and then imported to Stata 12 for analysis.

3.12 Data presentation and analysis

A combination of both quantitative and qualitative analysis was employed.

For quantitative analysis, frequency tables of socio-demographic characteristics (age, marital status, level of education, gravida, parity, gestational age and occupation.) were generated. Mean standard deviations, median and ranges as well as proportions were generated for all continuous data such as age and parity. Also, Coverage of IPTp uptake was tabulated. Again frequency tables were used to summarize the number of different views on the factors influencing IPTp-SP uptake.

Chi-Square Test and binary logistic regression analysis was used to test the level of significance and measure association between categorical variables and IPTp-SP uptake. Crude odds ratios were used to measure the strength of association between independent variables and SP uptake. To adjust for confounders, multiple logistic regressions was further used to measure adjusted odds ratio. For all statistical test in this study, a level of statistical significance was set at a p-value of <0.05 .

Age was categorized by five year intervals; highest level of education attained into none, basic, and post basic. Parity was categorized into nullipara (none), primipara

(one) and multiparae (two or more). Marital status was categorized into married, single, widowed, divorced and co-habiting and occupation into unemployed or employed.

Coverage, which is a measure of IPT uptake, was defined as the percentage number of pregnant women interviewed that have received none, one, two, three or more doses of SP at the time of the interview. This was in reference to the current pregnancy and was categorized as none (no dose); any dose (ever received); sub-optimal (≤ 2 doses) and optimal (≥ 3 doses).

The level of knowledge of the respondents on IPT was assessed based on four questions; purpose of IPT; when it was started during pregnancy; the number of doses and; the interval between doses. Based on the number of correct responses, it was rated between 0%-100% (0%) for all wrong responses; 25% for a correct response; 50% for 2 correct responses; 75% for 3 correct responses and; 100% for all correct responses). This was categorized into no knowledge (0%), low knowledge (25%), average knowledge (50%), good knowledge (75%) and very good knowledge (100%).

Again, respondents' knowledge of malaria in pregnancy was assessed based on four questions; the cause of malaria, effects of malaria on the pregnant woman, effects of malaria on the unborn foetus and other ways of malaria prevention during pregnancy. The number of responses was the basis for categorization into no knowledge (all wrong responses); low knowledge when only one correct response was provided; average knowledge had two correct responses, good knowledge when three correct responses were provided, and very good knowledge when all four responses were correct. There was a test of association between the levels of knowledge of these components and IPT uptake.

Pregnant women's perception about staff attitude was assessed using eight questions which included; being greeted on arrival, smiled at, shouted at, feeling comfortable to

ask questions, being satisfied about answers, perception about the time spent with them, encouragement for subsequent ANC visits by the way they were treated and being encouraged to invite others to attend. The level of association between these components of perceived attitude of staff and IPT was further tested.

Responses from the qualitative survey using in-depth interviews were tape recorded and transcribed. This was manually analysed and presented thematically.

3.13 Ethical considerations

Ethical clearance was obtained from the Ghana Health Service Ethical Review Committee. Permission was also obtained from the Regional Director and Sunyani Municipal Director of Health Services as well as hospital managers before conducting the study. A written informed consent was obtained from the study participants who voluntarily accepted to be part of the study after they were educated on the essence of the study. They were assured of the confidentiality of the information they provided and that it would be used solely for the purposes of the study objectives.

3.14 Limitations of the study

The study faced a limitation of, women refusing to give correct responses in fear of reporting the care providers. For women who could not speak English, the local language was used and for those who were in fear of reporting the service providers if they give correct information, their fears were allayed by assuring them of privacy and confidentiality of the data collected. The interviews were conducted in rooms where there was adequate privacy for the research assistant and the respondents.

The busy schedules of the health staff and the frequent interruptions by other health service providers means the study had to depend on fewer and much more experienced staff to provide valid and reliable answers.

CHAPTER FOUR

RESULTS

4.1 Socio-demographic Characteristics

A total of 400 pregnant women at 36 weeks or more gestation participated in the study.

Table 1 below shows the socio-demographic characteristics of the respondents.

The ages of the respondents ranged from 16 to 44years. The mean age was found to be 29.1 years (standard deviation, SD) ± 4.9 . Majority of the respondents (86.5%) were married with 90.2% having some kind of formal education, 90.3% in some form of employment and 45% being multiparous.

Table 1: Socio demographic characteristics of Study Participants, Sunyani, 2015

Characteristic	Frequency	%
Age category		
15-19	6	1.5
20-24	67	16.8
25-29	151	37.8
30-34	121	30.3
35+	55	13.8
Parity		
Nullipara	99	24.8
Primipara	120	30.0
Multipara	181	45.2
Marital Status		
Married	346	86.5
Single	36	9.0
Co-habiting	15	3.8
Widowed	6	1.5
Educational status		
None	35	8.8
Basic	139	34.7
Post Basic	226	56.5
Occupation		
Employed	361	90.3
Unemployed	39	9.7

4.2 IPT-SP uptake

The Coverage of SP is summarized in Figure 1 below.

SP uptake by the pregnant women ranged between 0 and 5 doses. An average of 3 doses received is considered optimal IPT uptake. Majority (44%) of the women had received 3 doses while only 1.5% received no dose of SP at 36 weeks gestation or above.

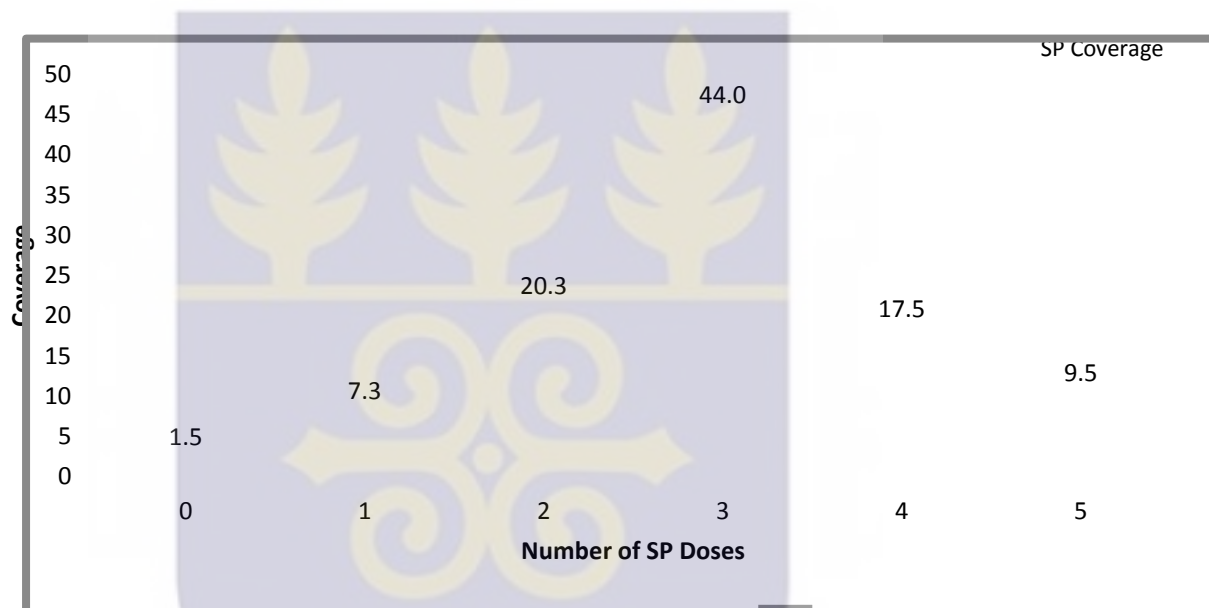


Figure 3: SP uptake



4.3 Gestational Age at first ANC, Number of ANC visits and SP Coverage

Table 2 is a summary of gestational age at first ANC, number of ANC visits and uptake of SP. The median gestational age for the pregnant women at first ANC visit was 15weeks (ranged between 4 and 36weeks). Majority of the women (61.2%) made their first ANC visit in the second trimester.

On the reasons for making their first ANC visit during the second and third trimester instead of the first as prescribed by policy, 57% said they did not have any problems with the pregnancy while 20% said they could not leave their work to attend ANC. Other reasons given for late ANC attendance included; wanted pregnancy to show first (12%); did not know they needed to attend ANC early (6%) and; being deterred by long distance to travel to ANC clinic (3%). Only 2% reported not having money for transportation to the facility as a reason for not making the first ANC visit during the first trimester.

The average number of visits made by the respondents was 7 (ranged from 2 to 12 visits), with a good number of them (97%) making at least 4 or more ANC visits.

Those who took at least one dose of SP were 394 (98.5%); 365 (91.3%) took at least two doses and; 110 (27.5%) took at most 2 doses of SP. Of the 6 respondents who took no dose of SP, two were found to have G6PD enzyme defects while the rest said they were not offered SP at all even though they reported early (12-19 weeks) and made more than four visits (6-12 visits).

In-depth Interviews with service providers to ascertain information about the cause of the drop outs in SP coverage showed that factors such as pregnant women visiting different facilities at a time; 4 ANC visit schedules which is inadequate; clients complaining about side effects and refusing to swallow medicine; poor documentation;

late first ANC attendance and defaulting. Another factor such as the requirement of treating malaria in pregnancy before giving SP or continuing with SP was also mentioned.

“...indeed, IPT 3 coverage is still a challenge. Some of the women come here to complain that they had side effects when they took the medicine the last time. And because of that they don’t want to take it again. And I cannot force them to take it because they may decide not to come to clinic again and if something happens to them I will be blame” [Key Informant1].

“...sometimes some of the people don’t write it in the book even if it was given. But the pregnant do tell us they have taken some. Also, when a woman starts IPT and get malaria, you have to stop and treat the malaria first. So if she keeps coming with malaria every month, then she may end up not giving the subsequent doses. Policy says pregnant women should visit the facility four times before they deliver if they don’t have any problem. And to me this 4 visit is inadequate considering that the pregnant woman needs to take 5 doses” [Key Informant 3].

Table 2: Characteristics of Respondents and IPTp-SP Coverage

Characteristics of Respondents		N=400	%
Trimester at 1 st ANC	1 st Trimester	129	35
	2 nd trimester	254	61.2
	3 rd trimester	17	3.8
Number of ANC visits	< 4 visits	12	3
	≥ 4 Visits	388	97
No. of SP Doses received	None (no dose)	6	1.5
	only One Dose	29	7.3
	Any dose (ever received)	394	98.5
	At least 2 doses (≥ 2 doses)	365	91.3
	Sub Optimal (≤ 2 doses)	110	27.5
	Optimal (≥ 3 doses).	284	71.0

4.4 Clients Knowledge of IPTp-SP and Malaria in pregnancy

Table 3 is a summary of knowledge variables on Malaria in Pregnancy (MiP) and IPTp while Table 4 summarizes the level of knowledge of MiP and IPTp. In assessing respondent's knowledge of MiP, four questions were used. Knowledge about the cause of malaria through mosquito bite was high (89%) with majority (55%) of them mentioning anaemia in pregnancy as an effect of MiP. For many (87%) of the respondents, ITN use is another effective way to prevent malaria in pregnancy.

Respondents' knowledge of IPTp was also assessed using four questions. Knowledge of the purpose of SP administration was high as 304 (76%) said it is to prevent mother and unborn baby from getting malaria. Generally, 276(69%) pregnant women had very good knowledge of MiP compared to 63(15.8%) who had very good knowledge of IPTp.

For majority of the women (84%), the staff at the ANC is their source of knowledge on IPTp and MiP. Other sources of knowledge mentioned were; television (9%); radio (5%) and; other pregnant women (2%).

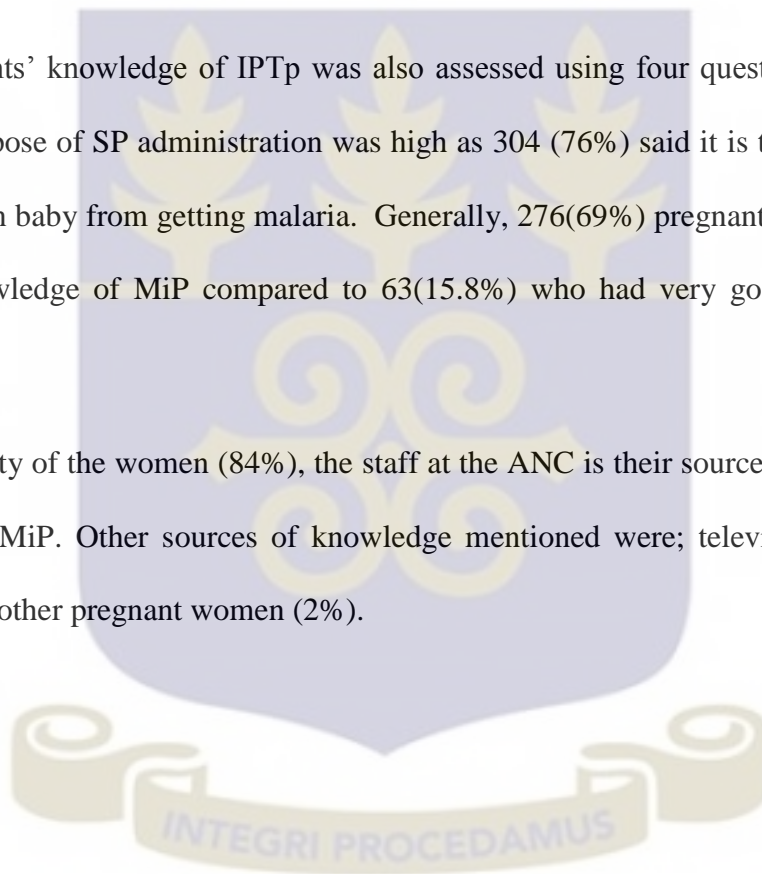


Table 3: Knowledge of Mip and IPTp among pregnant women attending ANC, Sunyani, 2015

Knowledge Variable	Responses	N	%
Malaria in Pregnancy			
Causes of malaria	Through bite of malaria	356	89
Effects of malaria on pregnant woman	Can cause anaemia	220	55
	Preterm labour	70	17.5
	Can cause death	64	16
Effects of malaria on unborn baby	Can cause spontaneous abortion	135	33.8
	Can cause intra uterine death	38	9.5
	Can cause low birth weight	60	15
Malaria Preventive methods	Can cause prematurity	98	24.5
	Sleep under an ITN	348	87
	Use mosquito repellent	35	8.8
	Wear protective clothing	8	2
IPTp			
Purpose of IPT	To prevent mother and baby from malaria	304	76
Time to start	≥16 weeks	196	49
Number of Doses in Ghana	5 doses	142	35.5
Interval between doses	1 month	381	95.3

Table 4: Levels of Knowledge of IPTp and MiP among pregnant women attending ANC, Sunyani, 2015

	MiP	IPTp
Level of Knowledge	N (%)	N (%)
No Knowledge	0(0)	6 (1.5)
Low Knowledge	6(1.5)	47(11.8)
Average Knowledge	28(7)	125(31.3)
Good Knowledge	90(22.5)	159(39.8)
Very good Knowledge	276(69)	63(15.8)

4.4 Characteristics of pregnant women and SP uptake

The uptake of optimal doses (≥ 3) of SP was high among pregnant women who had good Knowledge ($>50\%$) on IPTp (78.9%) and low among those who made less than 4 ANC visits. Pregnant women making less than 4 ANC visits (66.7%) had the high proportion of suboptimal (≤ 2) doses with those who have a good knowledge of IPT taking less suboptimal (≤ 2) doses (21.1%). Table 5 is a bivariate analysis of client characteristics and uptake of SP doses.

Table 5: Bivariate Analysis of Client Characteristics and Uptake of SP

	SP Doses		P value
	Sub Optimal (≤ 2 doses)	Optimal (≥ 3 doses)	
Age			0.20
<30 years	56(25.3)	165(74.7)	
≥ 30 years	54(31.2)	119(68.8)	
Parity			0.21
≤ 1	55(25.4)	162(74.7)	
≥ 2	55(30.9)	112(66.9)	
Marital status			0.37
Married	101(28.6)	252(71.7)	
Not married	9(22.0)	32(78.0)	
Educational Status			0.01
Not Educated	94(26.2)	265(73.8)	
Educated	16(45.7)	19(54.3)	
Employment status			0.15
Employed	84(26.3)	235(73.7)	
Unemployed	26(34.7)	49(65.3)	
Gestational Age at 1st ANC visit			0.06
Early (1 st &2nd trim)	103(27.1)	277(72.9)	
Late (3rd trim)	7(50.0)	7(50.0)	
Number of ANC Visits			<0.01
<4 visits	8(66.7)	4(33.3)	
≥ 4 Visits	102(26.7)	280(73.3)	
Knowledge of IPTp			0.01
Poor ($\leq 50\%$)	64(36.4)	112(63.6)	
Good ($>50\%$)	46(21.1)	172(78.9)	
Knowledge of MIP			0.03
Poor ($\leq 50\%$)	15(44.1)	19(55.9)	
Good ($>50\%$)	95(26.4)	265(73.6)	

4.5 Factors that affect IPTp-SP uptake

4.5.1 Client Related Factors That Affect IPTP-SP Uptake among Pregnant

Women

Education ($p=0.01$) was one of the socio demographic factor that was significantly associated with uptake of optimal SP doses among pregnant women. Those who were educated were about 69% less likely to take optimal doses of SP compared to those who were not educated in univariate analysis ($cOR=0.42$ 95% CI 0.21-0.86) but was not significant in multivariate analysis ($aOR=0.5$, 95% CI, 0.25-1.13).

The number of times a woman visited the facility ($p<0.01$), knowledge of IPTp ($p<0.01$) and knowledge of Malaria in pregnancy (MiP) ($p=0.02$) were found to be predictors of receiving optimal doses (≥ 3) of SP. Those who made more than 4 visits to ANC had a higher (5.5 times) odds of receiving optimal doses of SP as compared to those making less than four ANC visits in univariate analysis. This association remained significant after adjustment in multiple logistics regression ($aOR=4.7$, 95% CI 1.3-17.2). Pregnant women who had good knowledge of IPTp and MiP were 2.0 and 2.1 times more likely than those who have poor knowledge in the univariate analysis ($cOR=2.03$, 95% CI, 1.3-3.2. $cOR=2.19$ 95% CI 1.1-4.5) respectively. Good knowledge of IPTp and MiP remained predictive for uptake of optimal IPT doses when other factors were adjusted for in the multivariate analysis ($aOR=1.8$, 95% CI 1.15-2.96) and ($aOR=2.2$ 95% CI 1.03-4.62) respectively. Table 6 summarizes the client related factors that influence uptake of optimal doses of SP.

Table 6: Client Related Factors That Affect Uptake of IPTP-SP among Pregnant Women in Sunyani

Variable	SP Doses		Unadjusted Odd ratio		Adjusted Odd ratio	
	Sub Optimal (≤ 2 doses)	Optimal (≥ 3 doses)	(95% CI)	P value	(95%CI)	P value
Age						
<30 years	56(25.3)	165(74.7)				
≥ 30 years	54(31.2)	119(68.8)	0.75(0.48-1.17)	0.20	0.77(0.46-1.28)	0.32
Parity						
≤ 1	44(25.1)	131(74.9)				
≥ 2	25(30.9)	56(69.1)	0.75(0.48-1.17)	0.21	0.91(0.54-1.54)	0.73
Marital status						
Married	101(28.6)	251(71.7)				
Not married	9(22.0)	32(78.0)	1.42(0.66-3.09)	0.37	0.95(0.42-2.12)	0.43
Educational Status						
Educated	94(26.2)	265(73.8)				
Not Educated	16(45.7)	19(54.3)	0.42 (0.21-0.86)	0.01	0.5(0.25-1.13)	0.10
Employment status						
Employed	84(26.3)	235(73.7)				
Unemployed	26(34.7)	49(65.3)	0.7(0.40-1.15)	0.22	0.63(0.37-3.52)	0.11
Gestational Age at 1st ANC visit						
Early (1 st &2nd trim)	103(27.1)	277(72.9)				
Late (3rd trim)	7(50.0)	7(50.0)	0.40(0.15-1.22)	0.10	0.44(0.14-1.47)	0.19
Number of ANC Visits						
<4 visits	8(66.7)	4(33.3)				
≥ 4 Visits	102(26.7)	280(73.3)	5.5(1.6-18.8)	<0.01	4.7(1.31-17.2)	0.01
Knowledge of IPTp						
Poor (≤ 50)	64(36.4)	112(63.6)				
Good(>50)	46(21.1)	172(78.9)	2.03(1.30-3.19)	<0.01	1.8(1.15-2.96)	0.01
Knowledge of MIP						
Poor (≤ 50)	15(44.1)	19(55.9)				
Good(>50)	95(26.4)	265(73.6)	2.19(1.06-4.5)	0.02	2.2(1.03-4.62)	0.04

4.5.2 Service Delivery Factors that Affect IPTp-SP Uptake

Table 4 displays health service related factors and uptake of SP doses. Pregnant women who reported being shouted at during ANC were less likely to swallow optimal doses of SP compared to those who were not shouted at (cOR=1.5 [CI=0.7-3.0]). Also, pregnant women who felt staff spend enough time with them were 1.9 times more likely to swallow optimal doses of SP compared to those who felt staff did not spend enough time with them (cOR=1.5, 95% CI, 0.7-3.0). Availability of free water did not increase the odds of swallowing optimal doses of SP (cOR=0.9, CI= 0.3-3.7).

Table 7: Service delivery factors that affect uptake of SP doses

Variable	SP Doses		Unadjusted Odd ratio	
	Sub Optimal	Optimal	OR (95% CI)	P value
Before starting ANC				0.85
Staff do not greet	2(25.0)	6(75.0)	1.0	
Staff greets	108(28.0)	278(72.0)	0.9(0.2-4.3)	
At ANC, staff				0.55
Do not smile	2(20.0)	8(80.0)	1.0	
Staff smiles	108(28.1)	276(71.9)	0.6(0.1-3.1)	
During ANC staff				0.27
Did not shout at me	99(28.9)	244(71.1)	1.0	
Shouted at me	11(21.6)	40(78.4)	1.5(0.7-3.0)	
Asking ANC staff questions				0.99
I do not feel comfortable	5(27.8)	13(72.2)	1.0	
I feel comfortable	105(27.9)	271(72.1)	1.0(0.3-2.8)	
Answers to questions				0.96
Unsatisfactory	3(27.3)	8(72.7)	1.0	
Satisfactory	107(27.9)	276(72.1)	0.9(0.3-3.8)	
Time spend with staff				0.29
Not enough	5(41.7)	7(58.3)	1.0	
Enough	105(27.5)	277(72.5)	1.9(0.6-6.1)	
Treatment during ANC				0.38
Do not encourage	1(14.30)	6(85.7)	1.0	
Encourages	109(28.2)	278(71.8)	0.4(0.1-3.6)	
Free drinking water at ANC				0.96
Not available	89(28.3)	226(71.7)	1.0	
Available	21(26.6)	58(73.4)	0.9(0.3-3.7)	

4. 5.3 ANC Units Practices

Five ANC units' observations were done in this study. Table 8 summarizes the ANC unit's observations.

Table 8 : ANC unit Observation

Observations at ANC units	Number of Facilities (n=5)	%
Health education program drawn for the quarter includes MIP	0	0
Health education program drawn for the quarter includes IPTp	0	0
Health talk given at ANC on day of visit	5	100
Presence of posters of IPTp/MIP on the wall	2	40
Presence of ANC Report Book for daily summaries	5	100
Presence of ANC Monthly Data returns form	5	100
SP available at ANC	5	100
Practice of DOT observed	5	100
SP given is recorded in ANC book of clients	5	100
Presence of Adverse Event forms for SP	0	0
Presence of water for DOT	5	100
Presence of water for sale for DOT	5	100
Availability of IPTp National protocol	0	0
Availability of IPTp training manual	0	0

From the non-participant observations at the ANC units in Table 8, it was observed that only 2 (40%) facilities had posters of IPTp and MiP displayed on the walls. None of the ANC unit observed had a National IPTp protocol and IPTp training manual for referencing. The ANC units visited are usually supposed to give a health talk before the start of the day's work. However, none in this study had a planned health talk schedule that included malaria in pregnancy and IPTp for the quarter.

4.5.4 Practice of DOT

The practice of DOT was observed in all the facilities selected for observation at the time of visit. All the clients interviewed took SP under DOT. All the facilities observed had SP within the ANC (Table 8). This was also confirmed by the key informants in an in-depth interview (IDIs) a key informant said.

“The pregnant women are supposed to swallow the medicine here. Some don’t want to take the medicine, so they give an excuse that they haven’t eaten. So we tell them to eat before coming” [key Informant 1].

4.5.5 Availability of SP

All the facilities had adequate SP in stock (Table 8). Even though all the staff interviewed mentioned occasional shortage as a challenge to the implementation of the policy at some point in time, especially in the previous years, some were not affected by these stock outs due to proper logistic forecasting.

“For some time now we have not heard of any shortages. But previously there used to be, but my facility is not always affected because we do proper logistic forecasting” [Key Informant1].

Another key informant said that *“ever since I started work here since 2011, we have never short SP”* [Key informant 5].

“...the last time we run short of SP was in 2013 and at that we ask the women to buy it and bring to the facility so that we can observe them take it here” [Key Informant 2].

4.5.6 Availability of Water at ANC

It was observed that all the ANC clinics visited had water available within the ANC unit either for free or for sale for SP uptake (Table 8). This was confirmed by the key informants who reported the availability of free running tap water for DOT at the

facilities; however pregnant women prefer sachets water to the tap water. Hence, water is always made available for sale at the ANC for DOT. The availability of free water at ANC was reported by 20% of the respondents while the rest either bought water at the ANC (70%) or brought water from home (10%).

A key informant said *“we have a tap in the room here. But when they come, they don’t want that one. They say it is hospital water so they prefer to buy sachet water which we have made available here for easy access because the medicine is supposed to be DOT. Some of them also bring their own water from home”* [Key Informant 2].



CHAPTER FIVE

DISCUSSION

In this cross sectional study, socio-demographic characteristics, client related and service delivery factors that affect the uptake of IPTp-SP in the Sunyani Municipality was assessed. The findings of this study suggest a good level of uptake of IPTp-SP in the Sunyani Municipality. Factors such as education, knowledge of malaria in pregnancy, knowledge of IPTp, perceived staff attitude, availability of water and SP at ANCs and practice of DOT were identified to affect the uptake of optimal SP doses.

5.1 Uptake of IPTp

Findings from this study suggest that over 98% of pregnant women received at least one dose of SP in the Sunyani Municipality. Approximately 91% of pregnant women received at least 2 doses of SP and 71 % received 3 or more doses of SP. The current national target of IPTp is 100% of at least two dose of SP by the year 2015. The coverage of 91% of at least IPT2 suggests that, IPTp-SP use has almost met the National target. Again, the coverage of over 70% receiving at least 3 doses of SP in this study is higher than the national figure (39%) of IPTp 3 uptake reported in the Ghana demographic and health survey (GSS, 2014) and also higher than 23% of IPTp 3 which was reported by the WHO, in 2013. The difference in the proportions of IPT 3 uptake reported in this study (71%) and the national figure (39%) only underscore the different variations of IPTp uptake in Ghana. For instance, a similar study by Antwi (2010) in the Bosomtwi district found that over 95% of received at least one dose of SP, this is consistent with the findings of this study.

5.2 Client Related Factors Affecting IPTp-SP uptake

Education was one of the client socio-demographic factors which was found in this study to significantly affect optimal (≥ 3 doses of SP) uptake of IPTp-SP. This could be due to the fact that education enables people to be informed and make informed decisions and choices especially on maternal health issues. Women who are educated better appreciate the complications associated with pregnancy and childbirth (Hill et al., 2013a) and that pregnant women are more prone to get infected with malaria due to their lowered immunity. Also, considering that Sunyani is both the Municipal and Regional capital, majority of these pregnant women were probably in the working group, therefore better educated and informed.

Unmarried women were more likely to complete optimal SP dosage than women who were married. This is probably because, women who are not married may not have anybody supporting them at home and therefore, knowing the dangers associated with pregnancy, they have little option than to take their doses. On other hand, married women may be content that if sick there will be someone to carry them to the hospital.

It is expected that women who have given birth before (multiparous) would have had knowledge of the effects of malaria in pregnancy and IPTp because, they would probably have heard about it from previous pregnancies. This study however found no significant relationship between parity and uptake of IPTp SP. Similar to this finding, Amoran, Ariba, & Iyaniwura (2012) in Western Nigeria and Takem, Achidi, & Ndumbe (2009) in Cameroon found that, parity had no significant effect on receiving optimal doses of SP. It is possible that women are likely to forget information that was given to them during previous pregnancies or possibly could have suffered side effects in previous pregnancies and therefore will not want to take it in subsequent

pregnancies. Contrary to these findings, Antwi (2010) found that women with history of previous deliveries were more likely to comply with optimal IPTp uptake during pregnancy.

More than 70% of respondents in this study had good knowledge of IPTp which was a significant determinant of uptake of optimal doses of SP in the Sunyani Municipality. This study result is not different from results of other studies which reported that knowledge of IPTp is significantly related to uptake of IPTp (Amaran et al., 2012; Antwi, 2010; Exavery et al., 2014b; Nyonyi, 2012). Consistent with these findings, Nankwanga and Gorette (2008) reported low level of knowledge of IPT among pregnant women in Kampala which resulted in low coverage of IPTp. This explains that, probably health education among pregnant women on IPTp will better improve their knowledge level and increase uptake.

For many of the respondents, service providers at the ANC were their main source of information and knowledge of IPTp. But this study observed that none of the facilities had a planned health talk schedule that includes IPTp and MiP. And in key informant interviews (KII) some of the health staff did not show adequate knowledge on IPTp policy themselves. This consequently will have impact on the kind of information pregnant women will receive during ANC visits. Similar finding was reported by Antwi (2010) in the Bosomwte District. It is worrying that the service providers whom clients rely on for information and knowledge also have knowledge gaps in IPTp.

Some ANC staff reported in a KII that, SP is not given on an empty stomach and cannot be administered after 36 weeks. This is not consistent with the IPTp policy which says SP can be administered as soon as possible in the second trimester at monthly intervals till delivery and even on an empty stomach (World Health Organization, 2012). In a key informant interview, some health care providers were not

certain about the exact periods at which IPTp doses are administered and had either no previous training or refresher training on IPTp and MiP. According to one of such informant, “*We give SP to women who are 20 weeks pregnant and above at one month intervals. I heard currently, we are supposed to give up to 5 doses but I have not attended any workshop on it and I have not seen any document on it but I hear that is the practice now. So I ask the women to go and eat and come because SP cannot be taken on an empty stomach due to side effect*” said Respondent 4. This agrees with some other studies (Hill et al., 2013).

There was a good knowledge of the cause of malaria in pregnancy among the respondents in this study as over 80% of the women attributed the cause of malaria to mosquito bites. A similar study in Nigeria found a good knowledge of the cause of malaria among pregnant women (Akaba, *et al.*, 2013). However mothers knowledge of the effect of malaria in pregnancy was low, this is consistent with findings by Enato *et al.*, (2007). This low knowledge of effects of MiP have serious consequences on both the mother and the unborn child. Meanwhile, the association between perceived knowledge of the effects of MiP was not significant in previous studies (Chepkemai Ng’etich Mutulei, 2013).

Early first ANC is essential to receiving optimal doses of SP. It is assumed that a woman making early first ANC visit is probably likely to receive more doses of SP if backed with frequent ANC visits and provided SP is available and DOT is practiced at the facility. This study found that majority of the women made their first ANC visit in the first and second trimesters with a median gestational age of 15 weeks which is comparable to findings in Bosomtwe district where the median gestational age at first ANC was 16 weeks (Antwi, 2010). This implies that women in the Sunyani

Municipality attend clinic at an early gestational age but this did not make a significant difference on SP uptake. Similar to the findings of this study, Amoraan et al., (2012) found that early gestation at booking was not associated with IPTp uptake among pregnant women in Northern Nigeria. This could be because, women who make their first booking early in the third trimester (above 24 weeks) still stands the chance of receiving optimal SP doses of three or more with frequent visits at monthly intervals. Contrary to these findings, a study in Cameroon found that a significantly higher proportion of women who made their ANC visit in the third trimester received only one dose of SP compared to two or more doses among early attendees (Anchang-Kimbi et al., 2014).

Over 90% of the women made four or more ANC visits. The average number of recommended visits by WHO are four visits for no risk pregnancy. This study results suggest that women making more than four visits had up to 55% chance of receiving optimal doses of SP compared to those making less than four visits. This explains why 71% of the women received at least IPT3. This findings is similar to Antwi (2010) and Bouyou-Akotet et al (2013) findings which demonstrated that making four or more ANC visits is significantly related to receiving more doses of SP.

5.3 Service Delivery Factors that affect IPTp-SP uptake

To ensure the practice of DOT and improve upon SP uptake, SP must be available at all times as recommended by the IPTp guidelines. This study observed that SP was always available in all the facilities. A study in the Bosomtwe District reported similar findings were SP was available at all the facility visited at the time of study (Antwi, 2010). It could be deduced from the study that availability of SP influenced the high coverage of IPT. As a recommendation for the practice of DOT, there is the need for availability of

water at the ANC at all times. This study found no significant difference in SP uptake among women who had free water and those who bought water at the ANCs for DOT. In Nigeria, Onoka et al., (2012) found that availability of water in the facility is not an important constraint in the delivery of IPTp services as cheap alternative water sources existed. This is similar to the findings of this study.

In the Bosomtwe district of Ghana, the practice of DOT was observed in almost all the facilities ((Antwi, 2010), this is similar to the findings of this study where all the facilities were observed to practice DOT. These findings explain why it was possible for over 98% of IPTp1 among women in the Sunyani Municipality. Contrary to these findings, some studies in Nigeria found low provider adherence to the practice of DOT which resulted in low coverage (Akinleye et al., 2009; Onoka et al., 2012).

5.4 Challenges Facing IPTp implementation from the Key Informants Perspective

Some of the challenges of the programme outlined by the key informants include; late first ANC visits; occasional stock outs; women failing to return for subsequent SP doses; poor documentation; high dropout; lack of monitoring; women complaining of side effects (lower abdominal pains, skin rashes, restlessness, nausea and vomiting). Lack of periodic training on IPTp policy issues is also a challenge. These challenges were largely managed by staff, in collaboration with hospital management, for instance during stock out, hospital internal generated funds were used to complement regular supplies while proper forecasting is done to reduce frequent shortages. In some cases, follow up phone calls are made to defaulting women to ensure they return for subsequent visits to enable them complete their doses of IPTp. Staffs are also encouraged to attend refresher courses while pregnant women are encouraged to come early during ANC visits.

CHAPTER SIX

CONCLUSION AND RECOMMENDATION

6.1 Conclusion

Findings from this study suggest a high uptake of IPTp SP among ANC attendants in the Sunyani Municipality. Educated women were more likely to complete optimal IPTp doses compared to women who were not educated. Having a good knowledge of IPTp and Malaria in Pregnancy significantly influenced women to comply with uptake of optimal IPTp doses. Health service factors such as time spent by ANC staff with pregnant women was associated with optimal uptake of IPTp doses.

6.2 Recommendation

National Malaria Control Programme

1. Client – provider interaction training of ANC clinic staff should be organized to sustain the positive attitudes exhibited by staff towards the pregnant women and the resultant high level of uptake of SP at the ANC clinics.

The Ghana Health Service

1. Should as a matter of policy and in collaboration with the National Health Insurance Scheme, reconcile the number of recommended paid (NHIS coverage) antenatal visits and the number of doses of IPT-SP each pregnant woman is supposed to take during each pregnancy. This is due to the fact that the GHS policy recommends 4 paid (NHIS) visits during each pregnancy whilst the uptake of IPT-SP from 16 weeks of gestation every 4 weeks till delivery would need 5 or more visits and all within the 2nd and third trimester of pregnancy.
2. Should make available job aids and policies on IPTp and MiP to ANC staff

Municipal health Directorate

1. In line with improving drug surveillance as part of ANC services, adverse events forms should be readily available at the ANC clinics. This can help document the adverse effects of IPT-SP and to provide evidence for health education of the pregnant women on the side effects of the drug.
2. Investigate the causes of SP stock outs in the facilities.

Ante Natal Clinic staff and midwives

3. Should include topics on IPTp and MiP in their planned health education schedule for ANC
4. Ensure the availability of SP at all times
5. Staff at the ANC should spend more time with women during ANC visits (focused ANC should be practiced more)

Community

1. Female education should encourage



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APPENDICES

APPENDIX I: CONSENT FORM

Research Title: Factors Influencing IPTP-SP Uptake among Pregnant Women in Sunyani, Ghana

Principal Investigator:

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General Information about the study

This is a research study being undertaken by graduate student of the School of Public Health, University of Ghana, as part of the requirements for the Master of Public Health degree. The study seeks to assess pregnant women knowledge of IPTp, structural factors and health care workers' practices affecting provision of IPTp-SP uptake in selected health facilities in Sunyani Municipality. IPTp is one of the preferred strategies used to prevent malaria in pregnancy which could affect the mother and her unborn foetus. From studies, several factors including availability of SP and water at the facilities, numbers of ANC visits, perceived staff attitude, knowledge of IPT and gestational age at first ANC have all contributed to low IPT coverage. The aim of the study is to assess factors that influence IPTp-SP uptake in Sunyani, Ghana.

Procedures

Pregnant women of 36 weeks and above gestation who attend ANC services at the facilities will be included in the study. The study will involve answering questions from a questionnaire about factors influencing IPTp uptake in the Sunyani Municipality. If you are eligible and agree to participate, you will be required to respond to some questions. We will ask you questions about your background and a set of questions on your perception about how IPT service is delivered. The interview is expected to last 50 minutes. It will be appreciated if you could participate in this study. This is purely academic research which forms part of my work for the award of a Master's Degree in Public Health.

Risks and Discomforts

The procedures involved in this study are non-invasive and will not cause any discomfort to you as a participant. However, we will ask some information about your background, health and social wellbeing. If you feel uncomfortable to respond to some of the questions, you are free to skip the questions you are not comfortable responding to.

Possible benefits

There are no direct benefits to the participant of the study. However, the information you will provide, will contribute to overall knowledge about Factors Influencing IPTp-SP uptake in the Municipality. Results of the study may be used to improve IPTp services in the facilities.

Voluntary participation and right to refuse

Your participation in this study is voluntary. During the interview you can choose not to answer any individual question or all the questions. Additionally, you are at liberty to withdraw from the study at any time. However, I will encourage you to fully

participate in the study since your opinions are important in helping us to assess the Factors Influencing IPTp-SP uptake in the Sunyani Municipality.

Anonymity and Confidentiality

You are assured that whatever information is provided on the questionnaire will be handled with strict confidentiality. Your name or personal identification information will not be published in any report. Information submitted would not be shared with anybody who is not part of the study. Some staff of the research team may sometimes review the research records, but no unauthorized individual(s) will be able to access your information.

Compensation

There is no compensation for participating in this study. However, we will be grateful to you for the participation in the study and also helping us with information on the factors influencing IPTp-SP uptake.

Contact for Additional Information

If you have questions later, you may contact:

Ibrahim Hajira

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University of Ghana School of Public Health

College of Health Sciences

P. O. Box LG 13, Legon

Mobile: 0503545265

Email: ibrahimhajira@gmail.com

Your rights as a Participant

If you have any questions about your rights as a research participant, you can contact the Administrator of the Ghana Health Service Ethical Review Committee at the following address:

Ms Hannah Frimpong

GHS-Ethical Review Committee

Research and Development Division

Ghana Health Service

P. O. Box MB 190, Accra

Office: 0302 681 109

Mobile: 024 451 6482

Email: Hannah.Frimpong@ghsmail.org



VOLUNTARY CONSENT

I _____, declare that the above document describing the purpose, procedures as well as risks and benefits of the research titled **“FACTORS INFLUENCING IPTP-SP UPTAKE AMONG PREGNANT WOMEN IN SUNYANI, GHANA”** has been thoroughly explained to me in English/Twi language. I have been given the opportunity to have any questions about the research answered to my satisfaction. I hereby voluntarily agree to participate as a subject in this study.

_____/_____/_____
Signature or Mark of Participant Date

If participant cannot read the form themselves, a witness must sign here.

I, _____ was present while the purpose, procedures as well as risks and benefits were read to the participant. All questions were answered and the participant has voluntarily agreed to participate as a subject in this research study.

.....
Signature of Witness _____
Date

Interviewer’s statement:

I, _____, certify that the nature and purpose, the potential benefits and possible risks associated with participating in the study have explained to the above individual in the English/Twi language. The participant has freely agreed to participate in the study.

.....
Signature of person who obtained consent _____
Date

3. At what gestational age (months) were you first given some medication to swallow in the presence of the nurses? Confirm ANC Booklet
1. <4months [] 2. 4months [] 3. 5months [] 4. 6months [] 5. 7months [] 6. 8months [] 7. Never given []
4. How many tablets were they? 1. One [] 2. Two [] 3. Three [] 4. Four or more []
5. Did the medicine look like this one? (Please show a sample of SP) 1. Yes [] 2. No []
6. If no, how did it look like?
7. How many times did you swallow these same tablets during this pregnancy at the ANC? 1. 1x [] 2. 2x [] 3. 3x [] 4. 4x [] 5. 5x [] 6. Can't remember []
8. Were you served with to take the medicine? 1. Yes [] 2. No []
9. If no, how did you get the water to take the medicine? 1. Bought water at the ANC [] 2. Fetched water from the tap [] 3. Had my own water [] 4. Other, specify

SECTION 3: KNOWLEDGE OF IPTp

8. What was the medicine I showed you earlier used for? 1. To make me gain weight [] 2. To make my baby and I strong and healthy [] 3. To prevent me and unborn child from getting malaria [] 4. To give me a lot of blood [] 5. To cleanse my blood of diseases [] 6. Other, specify
7. Don't Know []
9. When is a woman supposed to start IPT? 1. Before 16weeks [] 2. 16weeks and above [] 3. After 24weeks [] 4. Don't Know []
10. How many times during a pregnancy does a woman have to swallow the tablets at the ANC in Ghana? 1. 1x [] 2. 2x [] 3. 3x [] 4. 4x [] 5. 5x [] 6. Don't know []
11. At what regular interval does the pregnant woman have to take the medicine at the ANC? 1. Weekly [] 2. Monthly [] 3. Fortnightly [] 4. Don't know []
12. How did you get to know about the above mentioned medicine? 1. ANC staff at ANC [] 2. Radio [] 3. Television [] 4. Mobile health service van [] 5.

Other pregnant women [] 6. Other, specify
.....

SECTION 4: KNOWLEDGE OF MALARIA IN PREGNANCY

13. What is the cause of malaria? 1. Through the bite of a mosquito [] 2. Dirty environment [] 3. Stuffy room [] 4. Ancestors
14. What are the effects of malaria on the pregnant woman? 1. Can cause anaemia [] 2. Preterm labour [] 3. Can cause death [] 4. Nothing don't know [] 5. Other, specify.....
15. What are the effects of malaria on the unborn baby? 1. Can cause spontaneous Abortion [] 2. Can cause Intra Uterine Death [] 3. Can cause low birth weight [] 4. Can cause prematurity [] 5. Nothing [] 6. Don't know [] 7. Other, specify.....
16. What other ways can a pregnant woman prevent herself from getting malaria?
1. Taking herbal preparations [] 2. Sleep under an insecticide treated net [] 3. Use mosquito repellent [] 4. Wear protective clothing, especially at night [] 5. Don't know [] 6. Other, specify.....

SECTION 5: STAFF ATTITUDE

17. Does the staff usually greet you before starting the ANCs? 1. Yes [] 2. No []
18. Does the staff usually smile at you during your ANC visits? 1. Yes [] 2. No []
19. Have you ever been shouted at during any of your ANC visits? 1. Yes [] 2. No []
20. Did you feel comfortable to ask the staff questions during your ANC visits?
1. Yes [] 2. No []
21. Are your questions answered to your satisfaction? 1. Yes [] 2. No []
22. Do you feel the staff spend enough time with you during your visits?
1. Yes [] 2. No []
23. Does the way you are treated encourage you to attend ANC? 1. Yes [] 2. No []
24. Does the way you are treated encourage you to tell others to attend ANC?
1. Yes [] 2. No []

SECTION 6: ANTENATAL RECORD INFORMATION

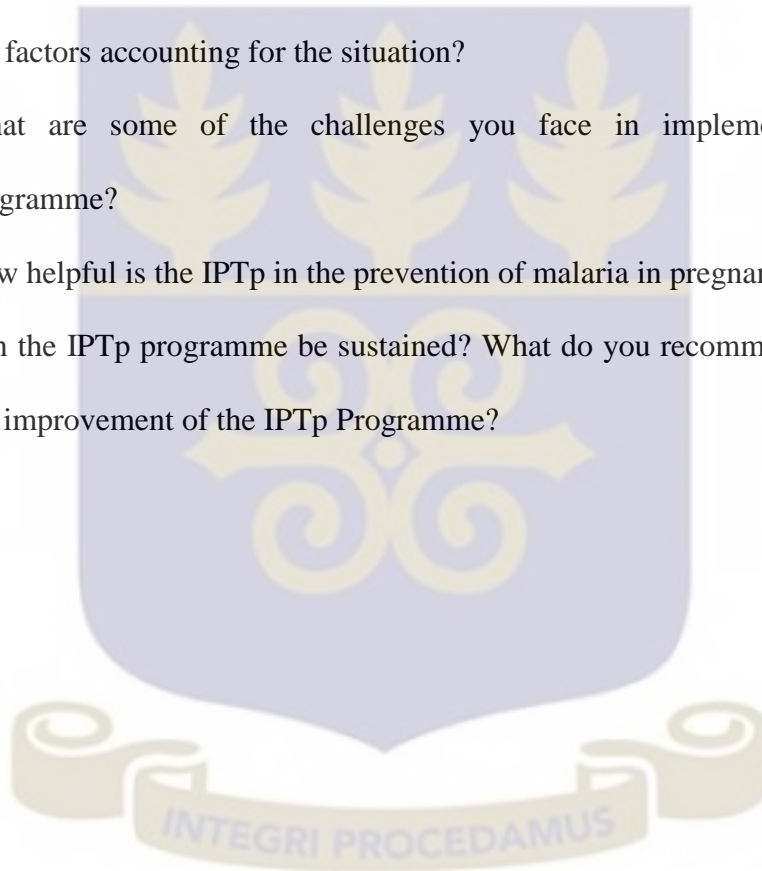
25. Total number of visits including this one []
26. Gestational age (weeks) recorded at first visit []
27. Number of doses SP recorded (given) []



APPENDIX 3: IN-DEPTH INTERVIEW GUIDE FOR HEALTH PERSONNEL

Code number:

1. Sex: Male [] Female[]
2. Rank (office or position held).....
3. Place of work.....
4. What is the current recommendation of IPTp-SP in Ghana??
5. Are there dropouts in SP uptake? What accounts for these drop outs?
6. What are your comments on the prevalence of malaria in pregnancy? What are the factors accounting for the situation?
7. What are some of the challenges you face in implementing the IPTp programme?
8. How helpful is the IPTp in the prevention of malaria in pregnancy?
9. Can the IPTp programme be sustained? What do you recommend in relation to the improvement of the IPTp Programme?



APPENDIX 4: CHECK LIST FOR ANC UNIT OBSERVATION

Code number:

Date:

Name of facility

Sub-district

Health education program drawn for the quarter includes MIP Yes () No ()

Health education program drawn for the quarter includes IPTp Yes () No ()

Health talk given at ANC on day of visit Yes () No ()

Presence of posters of IPTp/MIP on the wall Yes () No ()

Presence of ANC Monthly Data returns form Yes () No ()

SP available at ANC Yes () No ()

Practice of DOT observed Yes () No ()

SP given is recorded in ANC report Book Yes () No ()

SP given is recorded in ANC book of clients Yes () No ()

Presence of Adverse Event forms for SP Yes () No ()

Presence of water for DOT Yes () No ()

Presence of water for sale for DOT Yes () No ()

Availability of IPTp National protocol Yes () No ()

Availability of IPTp training manual Yes () No ()

Any additional observations made: