SCHOOL OF PUBLIC HEALTH

COLLEGE OF HEALTH SCIENCES

UNIVERSITY OF GHANA

FACTORS ASSOCIATED WITH UPTAKE OF INTERMITTENT PREVENTIVE TREATMENT IN PREGNANCY IN ADAKLU DISTRICT IN THE VOLTA REGION

BY

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DECLARATION

I declare that with the exception of references to other people's work, which have been duly acknowledged, this research work is my own work done under supervision. I also declare that this research work, partly or in whole, has not been submitted to any university for the award of any degree.

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DEDICATION

This work is dedicated to my wife Benedicta Dzissah and my good friend Dennis Tabiri for their immense support. I am forever grateful.

ACKNOWLEDGEMENT

I thank the Almighty God for his protection and guidance which has seen me through this phase and many other phases of my life. My heartfelt gratitude goes to my supervisor, Dr. Priscilla Awo Nortey for her guidance and counselling which extended beyond the scope of this research. I also acknowledge the support of all my friends especially Charles Kafui Agblanya, whose contribution to this research was invaluable. I am also grateful to Mr. Charles Kofi Azagba for his encouragement and support through it all.

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LIST OF ACRONYMS AND ABBREVIATIONS

ACT - Artemisinin-based Combination Therapy

ANC - Antenatal care

DHS - Demography Health Survey

DHIMS - District Health Information Management System

DHIS - District Health Information System

DOT - Directory Observed Therapy

GHS - Ghana Health Service

GSS - Ghana Statistical Service

HCW - Health care Worker

IPTp - Intermittent Preventive Treatment of malaria in pregnancy

ITNs - Insecticide Treated Nets

MIP - Malaria in Pregnancy

NHIS - National Health Insurance Scheme

NMCP - National Malaria Control Program

OPD - Out Patient Department

PMI - President's Malaria Initiative

RBM - Roll Back Malaria

SP - Sulfadoxine-Pyrimethamine

SSA - Sub-Sahara Africa

USAID - United State Agency for International Development

WHO - World Health Organization

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ABSTRACT

Introduction: Ghana together with other countries adopted a WHO policy in 2016 that provides Intermittent Preventive Treatment in Pregnancy to protect pregnant women and their unborn babies against malaria. This study aimed at assessing factors associated with uptake of Intermittent Preventive Treatment in Pregnancy (IPTp) within the Adaklu District.

Method: The study was a cross-sectional study. A structured questionnaire was administered to women attending postnatal care in December, 2022. Antenatal record books of the women attending postnatal care were reviewed and data collected on number of ANC visits and receipt of SP. Simple random sampling technique was used to select respondents from all facilities in each sub-District. HealthCare Workers who render ANC services in health facilities in Adaklu were interviewed. Logistic regression analysis was done to determine the association between the independent variables and uptake of IPTp. Data was analyzed with STATA version 16 with a statistical significance set at 5%.

Results: The uptake of IPTp reduced in increasing doses. Uptake for IPTp 1, IPTp3 and IPTp 5 was 98%, 56.3% and 6.9% respectively. Formal education among women attending postnatal care increased uptake of IPTp (OR-1.47 p = 0.001). Up to 29 (72.5%) of HCWs indicated the first dose of SP is given at 16 weeks. Stock levels of SP was adequate to meet the demands by the pregnant women in all the facilities for the period 2022.

Conclusion: IPTp 3 which is used as a proxy in calculating IPTp coverage in Ghana observed in this study did not meet the national target of 80%.

CHAPTER ONE

INTRODUCTION

1.1 Background

Malaria, a preventable, curable and a life-threatening disease is caused by *Plasmodium* parasites. An estimated 229 million malaria cases were recorded in malaria endemic countries throughout the world in 2019. An estimated 215 million cases accounting for 94% of cases was recorded in Africa in 2019 (World Malaria Report, 2020). Malaria is endemic with seasonal variations in Ghana. All Ghanaians are susceptible to malaria infection, however due to decreased immunity, children under five and pregnant women are more likely to have severe malaria. Depending on how long the dry season lasts in Ghana, different geographic regions have different malaria transmission seasons (USAID-PMI, 2016).

In Africa, malaria infection in pregnancy is primarily caused by *Plasmodium falciparum* with associated effects such as maternal morbidity and poor birth outcomes including preterm delivery and low birth weight. Malaria in pregnancy can cause stillbirth and preterm birth. Pregnant women are more susceptible to getting malaria and are more likely to suffer the severe form of the disease. In pregnancy, placenta infected with malaria parasites is a major risk factor for perinatal and neonatal and infant mortality, child growth retardation and poor cognitive outcomes (World Malaria Report, 2020).

Pregnant women are more vulnerable to malaria due to increased attraction to mosquito, hormonal factors, and immunological changes (Takem & D'Alessandro, 2013). Intermittent

preventive treatment in pregnancy (IPTp) is given to pregnant women at 16 weeks of gestation, then monthly till delivery was recommended by WHO in 2012. In 2016, a policy requiring the administration of three or more doses of IPTp to pregnant women was adopted and put into effect by 36 African nations, including Ghana. Comparing to 2015, when 18% of pregnant women took three doses of IPTp, around 19% did so in 2016 (World Malaria Report, 2017). Ghana reviewed and adopted WHO's recommended 3 strategic approach for preventive and management of malaria in pregnancy (MiP) in 2015. These are distribution and promoting Insecticide Treated Net (ITN) use at first ANC visit, administration of intermittent preventive treatment (IPTp), and management of malaria in pregnant women (USAID-PMI, 2018).

Investigating the variables that affect pregnant women's use of IPTp in Ghana's Adaklu District in the Volta region was the main objective of this research. The results of this study will advance our understanding and serve as a blueprint for developing interventions that will increase pregnant women's uptake of IPTp.

1.2 Problem statement

The use of sulfadoxine and pyrimethamine (SP), coupled with the promotion of long-lasting bed nets usage for the prevention of malaria in pregnancy was adopted in Ghana in 2003. Given as a directly observed therapy (DOT) at monthly intervals, pregnant women are served with SP as early as 16 weeks during ANC visit. The National Malaria Control Program (NMCP) reviewed and implemented a policy of three or more doses of SP uptake by pregnant women until delivery in 2017 as recommendation by WHO ("Ghana Malar. Indic. Surv.," 2019). In Sub-Saharan

Africa, SP coverage remains low at an average of 11.77% even though there have been remarkable achievements made with ITN uptake (Odjidja et al., 2017).

Pregnant women in Ghana who received one dose of SP improved from 58% in 2008 to 91% in 2019, while those who received two doses went from 46% to 80%. Pregnant women who received three doses of SP increased from 28% to 61% throughout the same time frame. Even though IPTp is given until delivery with a maximum of seven doses, the national target for IPTp coverage is 80%. IPTp 3 is used as the proxy in calculating IPTp coverage ("Ghana Malar. Indic. Surv.," 2019).

The Adaklu District recorded a downward trend in its IPTp coverages since 2013. Adaklu District recorded 67.5%, 61.1%, 54.9%, 35.4% and 18% for IPTp 1, IPTp 2, IPTp 3, IPTp 4 and IPTp 5 respectively in 2021 with a dropout of 18.7%. The achieved coverage of 54.9% in 2021 for IPTp 3 is below the national target of 80% or more (*DHIMS 2*, 2022).

The effect of malaria in pregnancy remains a public health concern as it affects the pregnant woman, the fetus and society. Some of the effects of malaria on the pregnant woman are severe anemia, acute pulmonary edema, acute renal failure and death. Spontaneous abortion, premature delivery, perinatal mortality, intrauterine growth restriction and low birth weight are some of the effects of malaria on the fetus. Malaria in pregnancy also causes low productivity, loss of job, and loss of income and resources on the family. Some factors known to contribute to IPTp uptake are client level factors such as age, occupation, religion, caregiver factors such as knowledge on malaria and IPTp and Healthcare facility factors such as availability of SP.

The objective of this study was to identify the variables associated with the low uptake of IPTp in the Adaklu District.

1.3 Research questions.

1. What was the uptake of IPTp in Adaklu District in 2022?
2. What are the Health Care Worker (HCW) factors associated with uptake of IPTp in Adaklu District?
3. What are the client factors associated with uptake of IPTp in Adaklu District?
4. What are the health facility factors associated with uptake of IPTp in Adaklu District?

1.4 Objectives

1.4.1 General objectives

To assess the factors associated with uptake of IPTp among pregnant women in Adaklu District.

1.4.2 Specific objectives

1. To determine the level of uptake of IPTp in Adaklu District.
2. To determine HCW factors associated with uptake of IPTp in Adaklu District.
3. To assess client factors associated with uptake of IPTp in Adaklu District.

4. To identify health facility factors associated with uptake of Adaklu District.

1.5 Justification of the study

The introduction of IPTp using SP is aimed towards eliminating malaria in pregnancy and its associated effects. This reality of eliminating malaria in pregnancy will not be achieved if eligible mothers due for IPTp in the Adaklu District do not receive SP when they are due. Research is therefore needed in this area to ascertain the factors contributing to uptake of IPTp in Adaklu District. Studies are needed to determine the variables influencing the uptake of IPTp in Adaklu District. Increased uptake of IPTp would aid in the reduction of low birth weight, maternal anemia, stillbirths and as well as maternal and neonatal fatalities in Adaklu District.

The study's recommendations may help authorities to implement initiatives to improve care quality and increase IPTp uptake in Adaklu District. Understanding the factors influencing uptake of IPTp in Adaklu District would help the District Health Directorate (DHD) and other Health Directorates in Ghana implement interventions to improve and sustain uptake of IPTp.

1.6 Conceptual framework for uptake of IPTp.

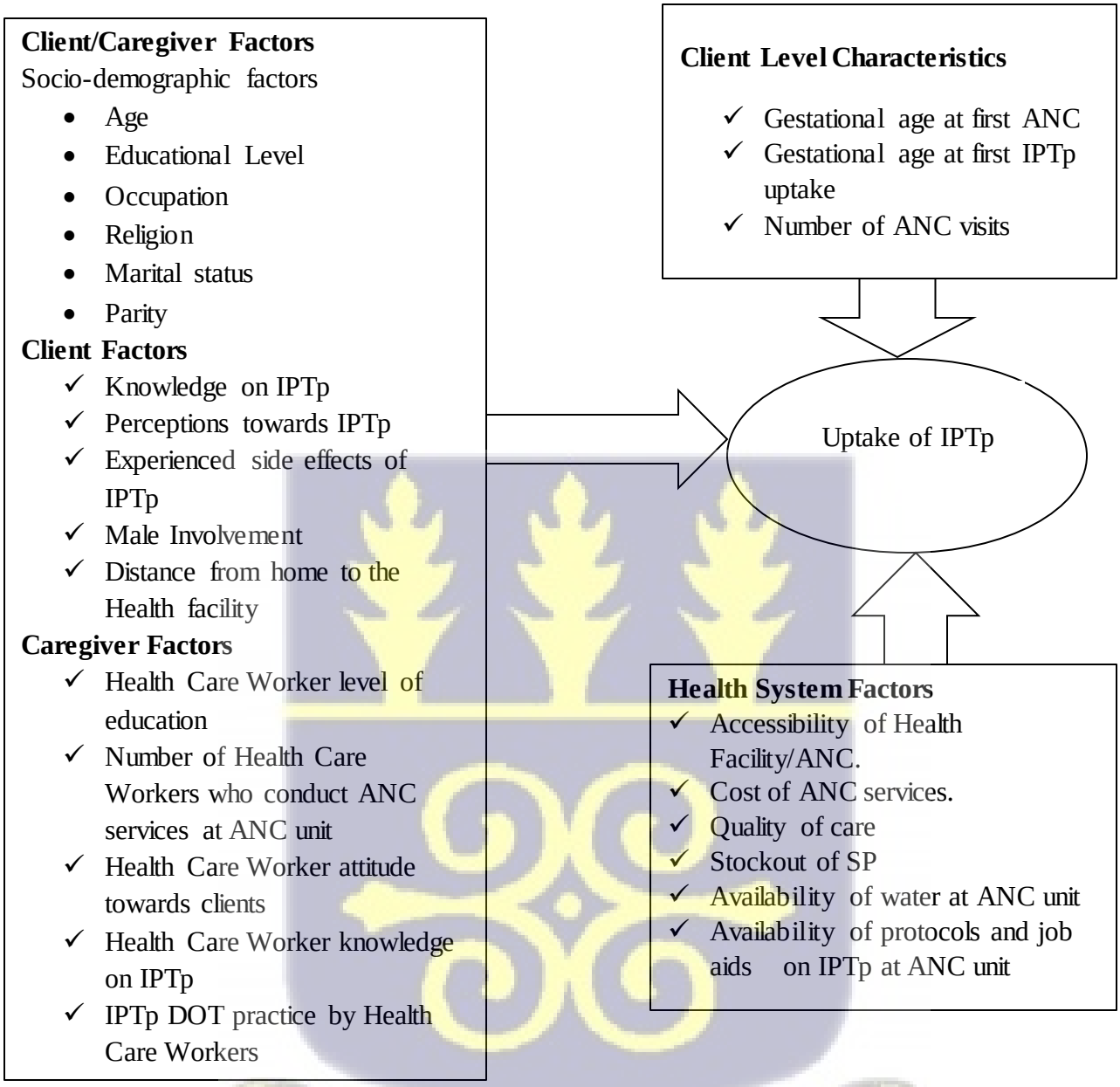

Figure 1: Conceptual framework showing factors associated with uptake of IPTp.

1.6.1 Narration of conceptual framework

Figure 1 is a conceptual framework that shows relationships between and among factors that influences the uptake of IPTp. Newman and Andersen healthcare model serves as the foundation for this concept. The model was developed in the 1960's and has undergone four phases with the final phase proffered in 1990. The model characterizes an individual's access to health care utilization into 3 main factors; predisposing, enabling and need factors. The predisposing factors refers to the sociocultural and demography factors that exist prior to an individual falling sick. Some of these factors are age, occupation, health beliefs etc. Enabling factors are the factors that promote access to acquiring health care which includes family and social support, availability of health personnel and facilities etc. Immediate cause of using health services is a need factor, such as health issues that create a need for medical care (Andersen, 1995).

Client level characteristics like age of pregnancy at first antenatal clinic, gestational age at first uptake of IPTp, number of antenatal clinic visits and G6PD status can influence the uptake of IPTp.

Client factors are the factors that positively or negatively affects the uptake of IPTp. Socio-demographic factors such as age, level of education, occupation, religion, income, and parity. Client's knowledge, perceptions, past experienced side effects of IPTp, male involvement also influences the uptake of IPTp. Caregiver/Health worker factors such as level of education, number of healthcare workers conducting ANC services at the ANC unit, IPTp given as DOT, healthcare worker knowledge on SP and healthcare workers attitude towards clients also contributes to the uptake of IPTp.

Health system factors are the factors that makes available IPTp to the eligible pregnant women. These factors are accessibility of ANC, cost of ANC services, quality of care, stock out of SP and availability of water at ANC.

CHAPTER TWO

LITERATURE REVIEW

2.1 Malaria in pregnancy burden

In 2016, 216 million malaria cases were reported globally. About 445,000 people died as a result of this in 2016 (WHO, 2017a). Africa accounts for more than 80% of the world's malaria cases, particularly children under five years of age and among pregnant women (Prasad, Rai, & Hussain, 2018; WHO, 2017a). It is estimated that, 125 million pregnant women globally reside in places where they have a high risk of getting malaria in pregnancy (Dellicour, Tatem, Guerra, Snow, & Ter Kuile, 2010). When compared to non-pregnant women, pregnant women have a threefold increased chance of developing severe malaria (Kovacs, Rijken, & Stergachis, 2015; WHO, 2015). Malaria in pregnancy is responsible for 200,000 neonatal deaths per year (WHO, 2019). Due to this, malaria in pregnancy is a prioritized area. An estimated 399,736 suspected malaria in pregnancy cases were reported in 2017 against 383,034 reported in 2016 (NMCP, 2018).

2.2 Intermittent preventive treatment of malaria in pregnancy

Nations with high malaria transmission rates, the WHO advises IPTp using SP to prevent malaria in pregnancy (World Malaria Report, 2013). SP has been confirmed to be safe to use during pregnancy and has no negative effects on the fetus (WHO, 2012). SP, a very cost-effective medicine in preventing malaria during pregnancy and lowering infant mortality in regions with moderate to high malaria transmission rates. It also protects the pregnant women and their

unborn children from some harmful effects of malaria such as maternal anemia and neonatal death (Sicuri et al., 2010).

A meta-analysis of seven studies in sub-Saharan Africa on IPTp revealed that, three or more doses were linked to a greater mean birth weight than two doses. Placental malaria was less common in the three plus dose group (Kayentao, Garner, Macarthur, & Luntamo, 2013).

WHO recommends that, every effort should be made to increase the use of IPTp throughout Africa, particularly in regions with a high malaria infection rate. This need to be covered by antenatal care, which calls for roughly 8 visits from pregnant women and the medicine (SP) served as a Directly Observed Therapy (DOTS). Folic acid at 0.4mg daily can be safely taken in combination with SP to maintain its antimalarial activity. It can be taken with or without food. (WHO, 2012).

2.3 IPTp coverage in Ghana

In 2003, Ghana began implementing the IPTp strategy in a few Districts. (Ghana Demographic Health [DHS], 2008). In order to comply with WHO's new guidelines in 2012 which mandated that all pregnant women get at least five doses of SP beginning at sixteen weeks' gestation and continuing until delivery, NMCP amended its policy in 2014 (PMI, 2016). In order to receive the necessary doses of SP, it was crucial that pregnant women begin their ANC visits very early. (Oppong et al., 2019). During the same time period, the proportion of pregnant women who received three or more doses of SP increased from 28% to 61%. Even though IPTp is given until

delivery with a maximum of seven doses, the nationwide target for IPTp is 80% using IPTp 3 as the proxy in calculating the coverage ("Ghana Malar. Indic. Surv.," 2019).

2.4 Socio- demographic factors affecting uptake of IPTp.

2.4.1 Age

WHO reported in 2014 that a key risk factor for pregnant women not receiving IPTp is being 20 years of age or younger. In Tanzania, pregnant women aged 30-34 and 35-39 were more likely than others to complete the recommended IPTp dose according to Kibusi et al., (2015). Pregnant women older than 34 had a decreased likelihood of taking the required doses of IPTp, according to research by Okethwangu et al. (2019). Women's age, however, was not substantially connected with their uptake of IPTp, according to Bajaria et al. (2019) in a study in Tanzania.

2.4.2 Parity

There was no correlation between taking the recommended three or more IPTp dosages and having a history of pregnancy in Kintampo (Oppong et al., 2019). In Ghana, people who have three or four children may have taken SP before and may not want to go through similar experiences with the side effect, which could result in them taking less SP (Owusu-Boateng & Anto, 2017). Bajaria et al., (2019) stated concluded that parity and uptake of IPTp were unrelated. Participants who had more than 3 children reported a low uptake of IPTp in Tanzania (Kisibu et al. 2015).

2.4.3 Marital status

A Tanzanian research by Kibusi et al. in 2015 showed a strong correlation between increased IPTp uptake among married or cohabiting women compared to single or divorced women. Married women in Kenya were more likely than single women to take the prescribed IPTp dosages (Choonara et al., 2015).

2.4.4 Educational level

A study by Kibusi et al. (2015) in Tanzania indicated there was a substantial correlation between educational level and uptake of IPTp. When compared to pregnant women who had never attended school, pregnant women with a second education in Chókwè district, southern Mozambique were nearly twice as likely to receive higher IPTp doses (Arnaldo et al., 2018). Promoting formal education beyond primary school may increase the acceptance of IPTp (Arnaldo et al., 2018).

2.4.5 Occupation

Compared to other occupational classes, self-employed individuals took less IPTp (Choonara et al., 2015).

2.5 Client level factors

2.5.1 Knowledge about IPTp and MiP

Uptake of IPTp was found to be significantly influenced by knowledge on MiP and IPTp. Educating pregnant women on the importance of IPTp and MiP could increase IPTp uptake (Amaron et al., 2012). A study conducted in East African revealed IPTp uptake was significantly influenced by IPTp awareness (Exavery et al., 2014a; Odongo, Bisaso, Byamugisha, & Obua, 2014). Gulema & Berhane, (2017); Njim, (2016), stated lack of knowledge of the indicated ANC schedule have a negative impact on uptake of IPTp.

2.5.2 Knowledge of pregnant women on IPTp.

In Western Nigeria, the knowledge of IPTp use was a major determinant for uptake of IPTp. Health education on the advantages of taking SP and the problems associated with malaria in pregnancy can help greatly increase the uptake of IPTp. (Amoran et al., 12).

2.5.3 Source of Knowledge

In a study in Kenya's Bungoma East District, pregnant women who relied on radio for information were 3 times likely to obtain IPTp dosages than pregnant women who relied solely on community healthcare workers for information (Chepkemoi Ng'etich-Mutulei & Odhiambo, 2014).

A study by Sabin et al in 2018, found that pregnant women in villages in Eastern India have a near universal respect for physicians, as has been shown in other countries in Uganda (Rassi et al., 2016). Even when women are hesitant about a preventive or treatment plan, they expressed a readiness to follow any advice given by a doctor, believing it to be more reliable than other sources of information and assistance.

2.5.4 Male partner involvement

In Ghana Boateng et al. (2018) found male partner involvement in the clinic was one of the most important factors influencing IPTp uptake. An increase in the number of men participating in ANC increased adoption of IPT2 by 0.5% and IPT3 by 0.7%. Because most remote area women rely heavily on their partners for support while seeking healthcare, male partner engagement can affect uptake of IPTp.

2.6 Healthcare worker factors

2.6.1 Healthcare worker attitude and client interaction

Amankwah and Anto (2019) found the quality of contact between the HCW and clients was critical in uptake of IPTp at private health facilities in Ghana's Tema Metropolis, as pregnant mothers would often adopt IPTp if the HCW encouraged them to do so. Both (Bajaria et al., 2019; Exavery et al., 2014b) concurred on what other studies had found that there exists a favorable relationship between uptake of IPTp and provider advise on the effectiveness of malaria treatments, the threat of malaria during pregnancy, and patient re-visitation to the same facility, resulting in patients taking more IPTp doses as recommended during visits. Ibrahim et

al.'s (2017) findings showed that the Sunyani Metropolis's health care employees' negative attitudes hindered the implementation of the IPTp. Women may decide to use ANC based on perceived treatment quality as well as facility readiness, according to Bajaria et al. (2019), therefore it is important to send them clearer and more authoritative messages.

2.6.2 HCW knowledge about MiP and IPTp

Almost all ANC clinic staff in Ghana, according to Antwi (2010), knew when to start the pregnant patient's SP operation. However, only 36.7% of the staff were aware of the SP's frequent adverse effects that pregnant women are likely to encounter, and 56.7% were aware of the SP administration contraindication. Sabin et al., (2018) revealed that HCWs were generally unaware of the suggested malaria prevention techniques in international standards. This highlighted the need for increased HCW education and a better use of them to spread knowledge of alternatives for practical malaria prevention strategies for expecting mothers. This was especially important for those working in ANC clinics or in communities.

2.6.3 Training of HCWs

Regular training and supervision of ANC service providers was critical in increasing SP uptake (Amankwah & Anto, 2019 and Rassi et al., 2016). In Uganda Nankwanga & Gorette, (2008) regular training and supervision on IPTp guidelines helps to improve Health care workers confidence and knowledge on SP's effectiveness.

2.6.4 Patient Nurse Ratio

According to the Ministry of Health's Holistic Evaluation 2015, Ghana exceeded the WHO recommended ratio of one nurse per 1,000 people. Ghana exceeded the WHO-recommended ratio of one nurse per 1,000 persons, according to the MOH Holistic Evaluation report, 2015. One nurse was needed for every 959 individuals in the country in 2014, and that number decreased to 739 in 2015 (PMI, 2016).

2.7 Health facility factors

No connection with IPTp uptake was found for any of the person or facility-level variables examined in private facilities in the Tema Metropolis (Amankwah & Anto, 2019).

2.7.1 Accessibility to health facilities

Ghana Health Service developed CHPS compounds to improve access to underserved communities. The basis of operations for a community health nurse is a CHPS compound, which comprises of at least a two-room building outfitted with essential curative and preventive care tools. When the CHPS program was introduced, more than 70% of Ghanaians were more than eight kilometers away from the closest healthcare facility, which was an issue brought on by shoddy roads. In Ghana, MIP prevention was primarily implemented through the districts, subdistricts, and CHPS zones (PMI, 2016).

2.7.2 IPTp and DOT policy

A study by Amankwah & Anto, (2019) revealed Midwives attending to pregnant women in Ghana admitted during an in-depth interview. 29% of the women who claimed they had ever taken the SP home provided evidence that compliance with this aspect of the guidelines was quite low. Additionally, many private midwives did not think DOT should be used because they anticipate people taking their medications at home. Some midwives in Kenya argued that because they work in private institutions, they cannot force women to take the medication under monitoring. (Hill, Dellicour, et al., 2013). It was reported that issues such as a scarcity of water and glasses at ANC units also posed as roadblocks to the successful implementation of DOT. A cross-sectional study in Enugu State that provide ANC services Onoka, Onwujekwe et al., (2012) discovered that lack of water in health facility had no effect on the provision of optimal IPTp services to pregnant women.

2.7.3 Stock status

Detailed discussions with some midwives in Ghana revealed there was no shortage of SP. (Owusu Boateng & Anto, 2017). Amankwah & Anto, (2019) agreed by noting supplies from the NMCP were readily available and could be obtained with the timely submission of requisitions, there was a consistent supply of SP. It is likely that women were not always given SP during ANC visits, as indicated in earlier Sub Sahara Africa studies, even though the MoH of Mozambique has not reported any SP stockouts since 2013 (Arnaldo et al., 2018; Florey, 2013; Hurley et al., (2016). Two supply-side obstacles to the uptake of IPTp for pregnant women were found in a qualitative study conducted in Uganda (Chepkemoi Ng'etich Mutulei, 2013).

2.8 Client level characteristics influencing uptake of IPTp.

2.8.1 Gestational age at first Antenatal Care visit

The gestational age at which pregnant women receive their initial IPTp dose varies by nation according to guidance from their national regulations. In Tanzania, the first dose of IPTp is given between 20 and 24 weeks of gestation, but the national guidelines on IPTp dosing in Ghana recommends taking IPTp from sixteen weeks of gestation.

Taking the first dosage of SP at sixteen weeks is also advised by Mali and Kenya. The first dose of SP should be administered at twenty weeks, according to Mozambique's national guidelines. (Gomez et al., 2014). Anders et al., (2008) in North East of Tanzania, reveals issues like limited SP medication stockpiles or women's personal choices hindered the early use of IPTp. An unexpectedly high percentage of pregnant women visiting prenatal clinics before to the recommended gestation for the administration of the first dosage of IPTp may possibly be a contributing cause.

2.8.3 ANC Attendance (Timing and Frequency)

The provision of antenatal care (ANC) by qualified healthcare professionals is crucial for ensuring a healthy pregnancy and improving pregnancy outcomes by identifying any difficulties early on, promoting healthy lifestyle choices, and providing opportunity for patients to communicate effectively with healthcare professionals. Although rates vary by country, ANC coverage has increased over time in sub-Saharan African nations (World demographics health survey, 2016).

In Ghana, 83% of rural and 92% of urban pregnant women got four or more ANC visits (Statistical Service Accra, 2015). Compared to a recent study conducted at Ghana's private medical institutions, where five ANC visits were on the average (Amankwah & Anto, 2019). As stated in the new guideline, the WHO (2016) advises a minimum of eight contacts. 15.2% of women in another facility-based study in Accra made the necessary eight or more visits. Although very important, the gestational age at which a pregnant woman attended her first ANC visit was not the primary determinant in obtaining additional doses of SP, but rather the quantity of pre-delivery visits, as observed in several earlier research (Owusu-Boateng & Anto, 2017).

According to Exavery et al. (2014), early ANC initiation was associated with a higher likelihood of IPTp uptake, and the time of ANC initiation was found to be highly useful in determining the degree of IPTp uptake among expecting mothers in Tanzania.

Late registration will reduce the number of IPTp that can be administered. In a study by Anchang-Kimbi et al. (2014) conducted in Cameroon to evaluate the factors that influence ANC clinic attendance and IPTp intake among pregnant women, it was found that women who had their first visit during the third trimester were more likely to only receive one dose (p=0.001), whereas women who had their first ANC attendance earlier were more likely to receive two or more doses (OR = 0.4; 95% CI = 0.2 - 0.7). In a previous study, Bouyou-Akotet et al. (2013) found that early SP initial dose uptake and the overall number of ANC visits made were the two main factors influencing the uptake of higher IPTp doses.

The ideal uptake of IPTp in Ghana, according to Odjidja, Kwanin, and Saha (2017), is influenced by a number of factors, including frequent visits to ANC clinics, health information, governance of the health staff, finances, products, and service delivery.

CHAPTER THREE

METHODS

3.1 Study Design

This study was a cross-sectional study employing a quantitative approach. Structured questionnaires and an observation checklist were used to collect data on uptake of IPTp and related factors. Data was collected from women attending postnatal care, healthcare workers and health facilities in Adaklu District in December 2022.

3.2 Study Area

Adaklu District is one of the eighteen districts in Volta Region of Ghana. Adaklu Waya serves as the capital of the District Assembly. It has an estimated population of 39,461 for 2021. It lies between Latitudes 6º41'N and 6 ° 1'N, and Longitudes 0º20'E and 0º1'E. It shares boundaries with Ho Municipal to the north, Central Tongu District to the south, Agortime Ziope district to the east, and Ho West District to the west. The District has a total land area of 4000 square kilometres. Two thirds of the total land area are not inhabited or cultivated. The main occupation of the indigenes is subsistence farming and cattle rearing.

Health Administration in the District is under the control of the District Health Directorate (DHD). There are 8 Health Centres and 9 Community-based Health Planning and Service (CHPS) Compounds that provide healthcare services to inhabitants in the District. Two of the Health Centres located in Waya and Sofa are owned by the Salvation Army and Evangelical

Presbyterian church. The rest are Government owned. The District is zoned into 5 Sub Districts. The Sub-Districts are Ahunda, Helekpe, Sofa Torda, Waya and Wumenu.

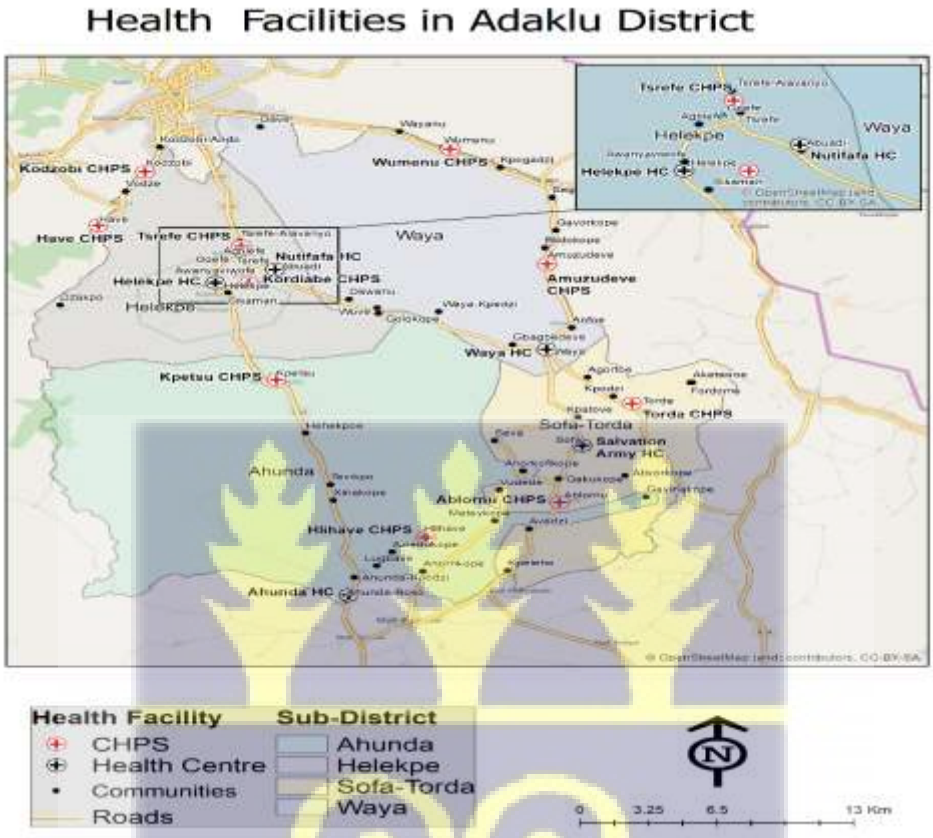

Figure 2: Map of Adaklu District showing Health Facility Distribution (GHS, 2022)

3.2.1 Adaklu District and Malaria

Adaklu is located in the nation's moist semi-deciduous forest zone. This renders the region conducive to *Anopheles* mosquito breeding, which in turn facilitates the spread of malaria (Adaklu District Health Directorate, 2022). Adaklu District Directorate recorded 2356 confirmed

cases of malaria in 2021 out of which 101 of these cases occurred in pregnant women (*DHIS 2, 2022)*

3.2.2 ANC and IPTp Delivery in Adaklu

Antenatal care services are delivered in all the Health Centres and CHPS Compounds in the district by Midwives and trained Community Health Officers.

3.3 Study Variables

3.3.1 Dependent Variable

The dependent variable was uptake of IPTp. Uptake was measured as the number of doses of SP taken by a pregnant woman at ANC. It was obtained from the mother's antenatal record booklet by counting the number of doses of SP taken during pregnancy.

Table 1. Operational definition and scale of measurement for variables.

Variables	Operational definition	Scale of measurement	Source of data
Uptake of IPTp	Number of Doses of SP received during pregnancy.	Ordinal	ANC booklets

3.3.2 Independent Variables

1. Socio-demographic characteristics of women attending postnatal clinic (marital status, age, parity, occupation, education level) was obtained by auditing ANC booklet and postnatal mother questionnaires.

2. Client-level factors such as gestational age at first ANC, ANC attendance, gestational age at first intake of SP dose, knowledge on MiP and IPTp, side effects of SP, perceived attitude about staff, and involvement of male partners were obtained from postnatal mother questionnaires and ANC book audit.

3. HCW questionnaire, postnatal mother questionnaires and facility checklist was used to obtain information on Health Facility factors such as health facility readiness to provide IPTp (average health provider patient ratio at the ANC clinic, availability of drinking water at the ANC clinic, distance from home to the health facility, availability of SP in the month of data collection, training schedule).

4. Health care worker factors like knowledge level on MiP and IPTp, educational level, DOT policy practice was obtained from observing and interviewing HCW using a structured questionnaire.

Table 2: Operational definition and scale of measurement for variables.

Variables	Operational definition	Scale of measurement	Source of data
Sociodemographic factors			
Age	Age in completed years	Interval	Interview
Educational level	Highest formal Education level attained	Ordinal • None • Primary • Senior High/Vocational • Tertiary	Interview
Marital status	Legal status of relationship with partner	Nominal • Single • Married • Divorced • Widow • Cohabiting	Interview
Occupation	What the individual does for a living (brings him/her regular income)	Nominal • Formal worker • Farming • Trading • Unemployed	Interview
Parity	Number of Children one had given birth to	Ratio	Interview
Client level factors			
Awareness of SP	Respondent awareness of SP.	Ordinal • Aware • Not aware	Interview
ANC Attendance	Number of ANC visits	Ratio	ANC booklet
Male partners Involvement	Number of times client was escorted by their partner for the ANC visits	Ratio	ANC booklet

Variables	Operational definition	Scale of measurement	Source of data
SP side effects	Have client experienced any adverse drug reaction following SP administration	Nominal • Headache • Itching • Dizziness • Vomiting • General weakness • Others	Interview
Knowledge about Malaria in Pregnancy (MIP)	Respondent knowledge on malaria	Ordinal • Poor • Moderate • High	Interview
Knowledge about IPTp	Respondent knowledge on IPTp	Ordinal • Poor • Moderate • High	Interview
Gestational age at first ANC	Number of months at which the clients visited the hospital	Ratio	ANC booklet
Gestation age at first SP dose	Number of months which client received first SP dose.	Ratio	ANC booklet
Health care worker factors			
Cadre of staff	Cadre of Health care worker	Ordinal • Enrolled Nurse • Community Health Nurse • Midwife, • Others	Interview
Level of knowledge about IPTp.	Knowledge of health care workers on IPTp	Ordinal • Low • Moderate • High	Interview
Perception towards IPTp DOTS policy	Do they think IPTp is effective or not.	Nominal • Yes • No	Interview
	Do you observe as clients swallow the medication?	Nominal • Yes • No	Interview

Variables	Operational definition	Scale of measurement	Source of data
	Do you record in the clients ANC book?	Nominal • Yes • No	Interview
Drinking water availability	Availability of water dispenser or drinking water at the ANC	Nominal • Yes • No	Interview/Observation
Distance to the health facility	Accessibility of the health facility	Ratio	Interview/Observation
Availability of SP	Stock status in the last 3 months	Nominal • Yes • No	Observation
Training status for practitioners	IPTp training for ANC staff	Nominal • Trained • Not trained	Interview
The place where SP is dispersed	Pharmacy/ANC	Nominal • Pharmacy • ANC	Interview

3.4 Study Population

In order to reduce recall bias within the study population, only women who attended Postnatal Clinics from the first day after delivery until six weeks in December 2022 were included.

Health care workers who provided routine ANC services at Ahunda Health Centre, Nutifafa Health centre, Mimi Clinic, Salvation Army Health centre, Waya Health Centre, Wumenu Health centre, Helekpe Health centre, Anfoe CHPS, Ablornu CHPS, Amuzudeve CHPS, Have CHPS, Hlihave CHPS, Kordiabe CHPS Kodzobi CHPS, Kpetsu CHPS, Tsrefe and Torda CHPS will be included in the studies. To ensure HCW selected for the study are conversant with the practices at the ANC unit, only HCWs who had worked at the health facility for at least six months were included in the study.

3.4.1 Inclusion Criteria

1. Health facilities which provides ANC services in the Adaklu District. These includes Ahunda Health Centre, Dave Health Centre, Nutifafa Health Centre, Helekpe Health Centre, Mimi Clinic, Salvation Army Health Centre, Waya Health Centre, Wumenu Health centre, Anfoe CHPS Compound, Ablornu CHPS Compound, Amuzudeve CHPS Compound, Have CHPS Compound, Hlihave CHPS Compound, Kodzobi CHPS Compound, Kpetsu CHPS Compound, Tsrefe and Torda CHPS Compound.

2. All women attending PNC from the first day after delivery until six weeks in December 2022 within any of the study health facilities.

3.4.2 Exclusion Criteria

1. All women who attended postnatal clinic without their ANC record booklets.

3.5 Sample Size Calculation for women attending PNC.

Cochrane's formula was used to calculate the sample size for this study.

$$n = (Z^2pq)/d^2$$

Where n = Sample size

Z = Standard normal variate for margin of error

p = proportion of pregnant women who took IPTp 3 or more

q = 1-p

d = margin of error

Using a confidence interval of 95%, a margin of error (α) = 5%. An assumed proportion of annual coverage of 61% for IPTp 3 in the 2019 Ghana demographic health survey was used in calculate the sample size because the prevalence of IPTp was unknown in all the health facilities that provide ANC services in the Adaklu district. This ensured that findings from the study were as close to the population estimates as possible. The sample size was calculated thus:

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

$$n = \frac{1.96^2 * 0.61(1 - 0.61)}{0.05^2}$$

n = 366

Adjusted for a potential non-response rate of 2%, n = 366 + (0.02 x 366)

n= 373

All healthcare workers who found conducting ANC services at the study facilities on the day of data collection and had worked in that facility for at least six months were included in the study.

3.6 Sampling Technique

The study participants were chosen using a stratified sampling procedure appropriate to size.

The Table below shows the WIFA target of each of the five Sub-Districts in Adaklu for 2021.

Table 3: Sample size determination by Sub District.

Sub Districts	WIFA Target(x)
Ahunda	2462
Helekpe	1799
Sofa	1232
Waya	1989
Wumenu	1989

The sample size was distributed among the health institutions within each Sub District using proportionate sampling, taking into account the average number of women seen at PNC. Women attending PNC were selected by the use of Simple random sampling by writing yes and no on pieces of papers folded and mixed up in a bowl. Each participant was made to select one piece of paper from the bowl. All women who selected yes were used for this study. Subsequent samples were drawn until the number required for each facility was reached. The Principal Investigator (PI) did the sampling at each of the various facilities.

All healthcare workers who conducted ANC at the study facilities on the day of data collection and had been working at the facility for at least six months were also part of the study.

3.7 Data Collection Instruments

Data was collected by the use of questionnaires and an observational checklist (Appendix 2: questionnaire). The questionnaires were on variables associated with uptake of IPTp. The observational checklist centered on uptake of IPTp. ANC record booklet of women attending postnatal care provided information on the uptake of IPTp.

3.7.1 Data Collection Technique.

After seeking the consent of women attending PNC, structured questionnaires were administered via interviews to collect data from them (Appendix 1: consent form). Samples of SP were displayed while interviewing respondents. Questions with detailed explanations was read to each of the women to choose options they deemed best, their ANC booklet were crosschecked to confirm some of the answers. Data collection took 15 minutes on a respondent. A face mask was given to every participant involved in the study to wear for the study.

Data was collected from all HCWs who conducts ANC at the facilities after seeking their consent. This lasted for 7 minutes.

Observation and record review were done at the health facilities using the checklist (Appendix 1: questionnaire). To ascertain the availability of training manual, ANC attendance register, daily health talk schedule and IPTp protocols, the PI reviewed records in the health facilities. Monthly stock levels of SP was also reviewed using SP bin cards.

Four research assistants collected data in the field and the principal researcher supervised the process throughout the period.

3.7.2 Quality Control

Research assistants were trained on data collection. The PI supported the research assistants in collecting data. The training was on ethics of data collection, field expectations and how to manage them. The PI was part of the data collection teams that went to facilities to pick data. Research assistants communicated via phone calls to the principal investigator in instances where the principal investigator was not with the teams. The PI took delivery of data from the research assistants after each day's work.

3.7.3 Pre-Testing of Questionnaires

Pre-testing of the questionnaires was done at Kpetoe health Centre, located in the capital of Agotime Ziope District. Based on the results of the pre-testing, changes were made to the questionnaire and observation checklist. When necessary, questions were translated into the participants' native tongue to make sure they understood them and could respond appropriately.

3.8 Data Processing and Analysis

Microsoft excel was used to clean the data. Data was analyzed with STATA version 16. Sociodemographic factors like marital status, age, religion, sex and occupation were presented in frequencies and percentages. The continuous variables which was not normally distributed were presented in quartiles, ranges and medians.

To determine the association between uptake of IPTp and the independent variables, logistic regression analysis was done. Independent variables at the univariate level with significant ***p***-values was used at the multivariable level of analysis and the model with the best Akaike's Information Criterion (AIC) and Bayesian's Information Criterion (BIC) were selected. The significance level was set at 5% for the analysis. Tables indicating odds ratio (crude or adjusted), percentages, confidence intervals and p-values were used to present the results. Relevant literature was to discuss the findings. The PI processed and analyzed all of the data.

3.9 Ethical Consideration

Ethical approval was sought from Ghana Health Service Ethics Review Committee with ref number GHS-ERC: 047109122 on October 31, 2022. Approval was also sought from the Volta Regional Health Directorate and Adaklu Health Directorate before the start of the study. Each participant's informed consent was sought prior to collection of data to ensure their voluntary involvement in the study. Each participant received thorough explanations of the study's risks, benefits and objective. Additionally, they were informed of their right to discontinue the study at any time. The informed consent form was required to be signed or thumb printed by participants who accepted to participate in the study. In order to maintain confidentiality, participant names were not recorded. In order to protect each interviewee's privacy, each interview was done in a space free from outside distractions. Checklists and questionnaires completed were kept away from outside parties. Participants did not receive any compensation for their participation in the study.

3.10 Sponsorship

This study was funded by the principal investigator. The PI completed all additional study-related tasks with assistance from the school of public health at the University of Ghana.

CHAPTER FOUR

RESULTS

4.1 Socio-demographic characteristics of respondents (women at PNC)

The study was done in 2022 among women attending PNC in the Adaklu District of the Volta region of Ghana. Respondents were drawn from the 5 sub- Districts in Adaklu District and were interviewed at all the 17 health facilities that conduct PNC. A total of 375 women attending PNC was used for this study due to the convenience of calculation.

The ages of the women attending PNC ranged from 15 years to 42 years, with a median age of 23 years (1st quartile: 28 years, 3rd quartile: 33 years). Most of them 277 (73.9%) fell within the age range of 20 years to 34 years. Up to 210 (56%) of women attending postnatal clinic were educated to the primary level, with only 24 (6.4%) being educated up to tertiary level. Majority of the respondents were married 220 (58.7%). Up to 171 (46%) of respondents were engaged in trading with 90 (24%) being unemployed. Christianity was the dominant religion observed among respondents 307 (81.9%).

Table 4 shows the distribution of socio-demographic characteristics of women interviewed at the Postnatal clinic.

Table 4: Distribution of Socio-demographic characteristics of study participants, Adaklu District, 2022

Characteristics (n=375)	Frequency	Percentage (%)
Sub – District		
Ahunda	97	25.9
Helekpe	70	18.7
Waya	79	21.1
Wumenu	79	21.1
Sofa – Torda	50	13.2
Age of women (years)		
15-19	37	9.9
20-24	78	20.8
25-29	103	27.5
30-34	96	25.6
35-39	59	15.7
40 or more	2	0.5
Educational Level		
No Formal Education	87	23.2
Primary Education	210	56
Secondary/Vocational	54	14.4
Tertiary Education	24	6.4
Marital Status		
Single	64	17.1
Married	220	58.7
Cohabiting	84	22.4
Divorced	4	1.1
Widowed	3	0.8
Occupation		
Unemployed	90	24.0
Formal worker	23	6.1
Farming	91	24.3
Trading	171	45.6
Religion		
Christianity	307	81.9
Islam	62	16.5
Traditionalist	6	1.6

Characteristics (n=375)	Frequency	Percentage (%)
Partners Educational Level		
No formal Education	83	22.1
Primary Education	193	52.8
Secondary/Vocational	66	17.6
Tertiary Education	28	7.5
Partners Religion		
Christianity	307	81.9
Islam	62	16.5
Traditionalist	6	1.6

4.2 Knowledge of Postnatal women on Malaria in Pregnancy and IPTp

Forty-three (43) out of the 375 women were confirmed to have had malaria in the course of their pregnancy. Most 324 (86.4%) of the respondents did not experience any undesirable side effect after being given the IPTp medication (SP). However, nausea, general malaise, dizziness and vomiting were reported by 51 (13.6%) as side effects experienced after taking the medication.

Out of the 375 women interviewed at the PNC, 304 (81.1%) indicated they spent less than 30 minutes to travel to a health facility for PNC. Majority of respondents 194 (51.7%) walked to the health facility for PNC with only 7.5% travelling by car. Though 205 (54.7%) of respondents spent nothing in terms of money to get to the health facility, 59 (15.7%) spent 20 Ghana cedis or more.

Only 9 (2.4%) of the women attending postnatal clinic had their partners accompanying them to ANC for more than 3 times when they were pregnant. Up to 244 (65.1%) did not have their partners accompanying them for any ANC visit.

Table 5 shows the results of knowledge of postnatal women on IPTp and Malaria in Pregnancy Adaklu District in 2022.

Table 5: Knowledge of postnatal women on IPTp and Malaria in Pregnancy in Adaklu District, 2022

Characteristics (n=375)	Frequency	Percentage (%)
Time Spent to get to PNC		
Less than 30 minutes	304	81.1
30 minutes to 1 hour	63	16.8
1 hour to 1.5 hours	5	1.3
1.5 hours to 2 hours	3	0.8
Mode of Transportation to PNC		
Walking	194	51.7
Motorcycle	153	40.8
Car	28	7.5
Cost of Travel for PNC		
Zero	205	54.7
Less than 10 cedis	36	9.6
10 – 19 cedis	75	20.0
20 or more cedis	59	15.7
Perception of attitude of ANC staff		
Poor	1	0.3
Good	58	15.5
Very Good	272	72.5
Excellent	44	11.7
Number of times accompanied by partner to ANC		
None	244	65.1
1-3 times	122	32.4
More than 3 times	9	2.4
Heard about SP		
No	19	5.1
Yes	356	94.9
Given SP to swallow at ANC		
No	3	0.8
Yes	372	99.2

Characteristics (n=375)	Frequency	Percentage (%)
Experienced any side effect after taking SP		
No	324	86.4
Yes	51	13.6
Side effect experienced (n=51)		
Nausea	21	41.1
General malaise	24	47.1
Dizziness	4	7.8
Vomiting	2	3.9
Did side effect prevent you from taking subsequent doses		
No	17	33.3
Yes	34	66.7
Required to pay any money for SP		
No	374	99.7
Yes	1	0.3
Provided water at ANC		
No	310	82.7
Yes	65	17.3
How much paid for water (Ghc)		
Nothing	302	80.5
0.20 pesewas	72	19.2
0.40 pesewas	1	0.3
Reported feverish symptoms during ANC		
No	328	87.5
Yes	47	12.5
Confirmed to have malaria (n=47)		
No	4	8.5
Yes	43	91.5
Number of times confirmed to have malaria (n=43)		
Once	33	76.7
Twice	8	18.6
Thrice	2	4.7
Knowledge of effects of malaria on a pregnant woman		
Anemia	55	14.7
Miscarriage	285	76.0
Death	35	9.3

Characteristics (n=375)	Frequency	Percentage (%)
Knowledge of effects of malaria on a pregnant woman		
Low birth weight	28	7.5
Deformity	12	3.2
Death	335	89.3

4.3: Knowledge on IPTp and Malaria in Pregnancy among HCWs.

A total of 40 healthcare workers providing ANC services in all the 17 health facilities were interviewed in the 5 sub-Districts of Adaklu. Midwives interviewed were 19 (47.5%). Up to 23 (57.5%) had practiced for one to three years.

All the healthcare workers interviewed knew IPTp as a prophylactic drug against malaria in pregnancy. Up to 29 (72.5%) of respondents interviewed indicated the first dose of SP is given at 16 weeks. The remaining 11 (27.5%) said the first dose of SP is given when a pregnant woman experiences quickening (first movement of fetus).

Table 6 shows the results of knowledge on IPTp and Malaria in Pregnancy among HCWs.

Table 6: Knowledge on IPTp and Malaria in Pregnancy among HCWs in Adaklu District, 2022

Characteristics (n=40)	Frequency	Percentage (%)
Sub- District		
Ahunda	9	22.5
Helekpe	10	25.0
Waya	9	22.5
Wumenu	8	20.0
Sofa – Torda	4	10.0
Cadre of Healthcare worker		
Midwives	19	47.5
Community Health Nurse	14	36.0
Enrolled Nurse	5	12.5
Registered General Nurse	2	5.0
Years of Practice		
1 -3 years	23	57.5
4 – 6 years	14	35.0
More than 6 years	3	7.5
Knowledge on IPTp		
What is IPTp		
Prophylaxis against malaria in pregnancy	40	100.00
When first dose of SP given		
At quickening	11	27.5
At 16 weeks	29	72.5
How often SP is given		
Monthly	40	100.00
Number of times IPTp is given		
4 times	8	20.00
5 times	32	80.00
Effectiveness of IPTp in preventing malaria		
Yes	40	100.00
Trained on IPTp		
Yes	40	100.00

Characteristics (n=40)	Frequency	Percentage (%)
Number of health workers who conduct ANC		
2	8	47.1
3	8	47.1
5	1	5.8
Average number of ANC clients seen daily		
5	13	76.5
10	4	23.5

4.4 ANC attendance and uptake of IPTp.

Observation from the maternal and child health record booklet of women attending postnatal clinic indicated 70 (18.67%) attended ANC six times before they delivered. Up to 53 (14.13%) of respondents reported for ANC services at week 4 of gestation with only 1 (0.27%) reporting at 32 weeks. Out of the 375 women, 114 (56.3%) received 3 doses of IPTp before they delivered whiles 7 (1.8%) did not receive IPTp before delivery.

Table 7 shows the distribution of ANC attendance and uptake of IPTp among postnatal women.

Table 7: Distribution of ANC attendance and IPTp uptake in Adaklu District, 2022

Characteristics (n= 375)	Frequency	Percentage (%)
ANC attendance		
1	1	0.27
2	25	6.67
3	52	13.87
4	55	14.67
5	61	16.27
6	70	18.67
ANC attendance		
7	38	10.13
8	41	10.93
9	22	5.87
10	4	1.07
11	5	1.33
12	1	0.27
Age of pregnancy at first ANC attendance (weeks)		
First trimester	191	50.9
Second trimester	173	46.1
Third trimester	11	2.9
Age of pregnancy at first ANC attendance (weeks)		
4	53	14.13
6	1	0.27
8	74	19.73
9	1	0.27
12	61	16.27
14	15	4.00
16	60	16.00
17	1	0.27
18	8	2.13
20	55	14.67
21	3	0.80
22	1	0.27
24	30	8.00
26	2	0.53
28	8	2.13
32	1	0.27

***These were the observed results of the data collected in the field*

Characteristics (n= 375)	Frequency	Percentage (%)
When first dose of SP was taken		
Before 16 weeks	11	3.0
At 16 weeks	171	46.5
17-24 weeks	160	43.5
25 weeks or more	26	7.1
Total number of SP doses taken		
0	7	1.87
IPTp 1	58	98.1
IPTp 2	99	82.7
IPTp 3	114	56.3
IPTp 4	71	25.9
IPTp 5	26	6.9
Less than 3	164	43.7
3 or more doses	211	56.3
IPTp 3 uptake		
No	164	43.7
Yes	211	56.3

4.5 Healthcare facilities and uptake of IPTp in in Adaklu District, 2022

The 17 health facilities visited in Adaklu district in November 2022 showed availability of SP, job aids on IPTp and Malaria in Pregnancy in the ANC. There was no shortage of SP within the past 6 months in any of the facilities. IPTp administration to pregnant women at the ANC was served as DOT in all the 17 facilities.

Healthcare facilities and uptake of IPTp in Adaklu District are shown in Table 8.

Table 8: Healthcare facilities and uptake of IPTp in Adaklu District, 2022

Characteristics (n= 17)	Frequency	Percentage (%)
IPTp served to pregnant women recorded in MCHRB at ANC		
No	0	0
Yes	17	100
IPTp served to pregnant mothers recorded in the ANC register in the ANC unit?		
No	0	0
Yes	17	100
Job aids on IPTp pasted on the walls in the antenatal unit		
No	0	0
Yes	17	100
Job aids on malaria in pregnancy pasted on the walls in the antenatal unit		
No	0	0
Yes	17	100
Availability of adverse event forms for SP at the antenatal unit		
No	0	0
Yes	17	100
SP currently available at the antenatal unit?		
No	0	0
Yes	17	100
IPTp observed as DOT in the antenatal clinic?		
No	0	0
Yes	17	100

4.6 Association between socio-demographic characteristics and uptake of IPTp.

The Sub-District of residence of women attending postnatal clinic in Adaklu District was found to have a statistically significant association with uptake of IPTp. Residents of Waya Sub-District had 6.11 increased odds of uptake of IPTp. Similarly, Sofa Torda residents had 4.42 increased odds of uptake. Age of mothers was not found to be statistically associated with uptake of IPTp, however their educational level was. Having up to primary level education was associated with 3.29 (***p*** <0.001) increased odds of uptake as compared to having no formal education. Additionally, those educated up to secondary/vocational level and tertiary level had 2.99 (***p*** =0.002) and 4.44 (***p*** =0.002) increased odds on uptake respectively when compared with those with no formal education.

Occupation was significantly associated with uptake of IPTp. Being a farmer (OR: 1.82, ***p*** =0.046) or engaging in trading (OR:2.03, ***p*** =0.007) had statistically significant increased odds of uptake as compared to being unemployed. Being a Muslim (OR:0.10, ***p***<0.001) was associated with 81% reduced odds of uptake as compared to being a Christian. However, being a traditionalist was not significantly associated with uptake when compared to being a Christian.

Table 9 Provides the odds ratios, 95% confidence intervals and p-values of association between socio-demographic characteristics of mothers and uptake of IPTp.

Table 9: Association between socio-demographic characteristics of mothers and uptake of IPTp.

Characteristic	Odds ratio	95% Confidence Interval	P-value
Sub-District			
Ahunda (base)	1.00		
Helekpe	1.23	0.66 – 2.30	0.508
Waya	6.11	3.09 – 12.11	<0.001
Wumenu	1.76	1.00 – 3.22	0.065
Sofa Torda	4.42	2.08 – 9.37	<0.001
Age of women (years)			
15-19 (base)	1.00		
20-24	1.36	0.61 – 3.00	0.446
25-29	0.90	0.42 – 1.91	0.786
30-34	1.00	0.47 – 2.15	0.991
35-39	1.43	0.62 – 3.29	0.401
40 or more	0.85	0.05 – 14.64	0.911
Educational level			
No formal education (base)	1.00		
Primary education	3.29	1.69 – 6.41	<0.001
Secondary/vocational	2.99	1.48 – 6.68	0.002
Tertiary	4.44	1.70 – 11.64	0.002
Marital status			
Single (base)	1.00		
Married	0.37	0.20 – 0.68	0.001
Cohabiting	0.70	0.35 – 1.42	0.329
Divorced	1.17	0.11 – 12.04	0.893
Widowed	1.96	0.02 – 2.29	0.194
Occupation			
Unemployed (base)	1.00		
Formal worker	2.45	0.94 – 6.37	0.065
Farming	1.82	1.01 – 3.29	0.046
Trading	2.03	1.21 – 3.41	0.007
Religion			
Christian (base)	1.00		
Islam	0.19	0.10 – 0.36	<0.001
Traditionalist	3.04	0.35 – 26.31	0.313

Characteristic	Odds ratio	95% Confidence Interval	P-value
Partner's educational level			
No formal education (base)	1.00		
Primary education	3.55	1.74 – 7.25	0.001
Secondary/vocational	2.80	1.43 – 5.48	0.003
Tertiary	4.63	1.85 – 11.80	0.001
Partner's religion			
Christian (base)	1.00		
Islam	0.19	0.10 – 0.36	<0.001
Traditionalist	3.04	0.35 – 26.3	0.313

4.7 Association between knowledge of women attending postnatal care on IPTp, Malaria in Pregnancy and uptake of IPTp.

Time spent in getting to the health facility to access ANC services was not found to be associated with uptake of IPTp, however the mode of transportation was. Using motorcycle as mode of transportation was associated with 66% (p<0.001) reduced odds of uptake as compared to walking. When mothers were educated on SP during ANC, it resulted in 7.5 (p=0.002) increased odds of uptake compared to when they are not. However, experiencing undesirable side effects from the medication was associated with 70% (p<0.001) reduced odds of uptake. Knowing miscarriage as an effect of malaria on pregnancy was associated with 2.65 (p=0.001) increased odds of uptake of IPTp.

The statistical association between knowledge of women attending postnatal care on IPTp, Malaria in Pregnancy and uptake of IPTp are shown in Table 10.

Table 10: Association between knowledge of women attending postnatal care on IPTp, Malaria in Pregnancy and uptake of IPTp.

Characteristic	Odds ratio	95% Confidence interval	P-value
Time spent to get to ANC			
Less than 30 minutes (base)	1.00		
30 minutes to 1 hour	0.60	0.35 – 1.04	0.070
1 hour to 1.5 hours	0.41	0.08 – 2.89	0.414
1.5 hours to 2 hours	1.42	0.13 – 15.78	0.778
Mode of transportation to ANC			
Walking	1.00		
Motor bicycle	0.34	0.22 – 0.52	<0.001
Car	0.54	0.24 – 1.21	0.134
Cost of travel to ANC (Ghc)			
Zero (base)	1.00		
Less than 10	0.65	0.32 – 1.33	0.237
10 – 19	0.45	0.26 – 0.78	0.004
20 or more	0.29	0.16 – 0.53	<0.001
Perception of attitude of ANC staff			
Poor (base)	1.00		
Good	0.76	0.35 – 1.67	0.495
Very good	1.04	0.55 – 1.97	0.911
Number of times accompanied by partner to ANC			
None (base)			
1-3 times	1.05	0.68 – 1.63	0.823
Number of times accompanied by partner to ANC			
More than 3 times	2.83	0.58 – 13.88	0.201
Where first heard about SP			
ANC (base)	1.00		
Friends/Family	1.15	0.19 – 6.99	0.876
Educated on SP			
No (base)	1.00		
Yes	7.50	2.15 – 26.19	0.002

Characteristic	Odds ratio	95% Confidence interval	P-value
Experienced any side effect after taking SP			
No (base)	1.00		
Yes	0.30	0.16 – 0.57	<0.001
Side effect experienced			
Nausea (base)	1.00		
General malaise	0.18	0.05 – 0.72	0.015
Vomiting	0.91	0.05 – 16.54	0.949
Did side effect prevent you from taking subsequent doses			
No (base)	1.00		
Yes	0.06	0.01 – 0.24	<0.001
Provided water at ANC			
No (base)	1.00		
Yes	1.62	0.94 – 2.89	0.079
Reported feverish symptoms during ANC			
No (base)	1.00		
Yes	0.65	0.35 – 1.20	0.164
Confirmed to have malaria			
No (base)	1.00		
Yes	0.87	0.11 – 6.75	0.894
Knowledge of effects of malaria on a pregnant woman			
Anemia (base)	1.00		
Miscarriage	2.65	1.46 – 4.81	0.001
Death	0.96	0.40 – 2.30	0.921
Knowledge of effects of malaria on a pregnant woman			
Low birth weight (base)	1.00		
Deformity	3.00	0.67 – 13.47	0.152
Death	1.28	0.59 – 2.77	0.532

4.8 Association between ANC attendance and uptake of IPTp

ANC attendance of 5 or more was associated with 9.55 (***p***<0.001) increased odds of uptake as compared with ANC attendance between 1 and 4. Reporting for ANC between 17 and 24 weeks of gestation was associated with 59% (***p***<0.001) reduced odd of uptake as compared to reporting before 17 weeks. Additionally, reporting after 24 weeks was associated with 94% (***p***=0.007) reduced odds uptake when compared to reporting before 17 weeks. Furthermore, when the first dose of IPTp was taken at 25 weeks or more gestation, it resulted in 99% (***p***<0.001) reduced uptake when compared with taking the first dose at 16 weeks.

Details of association between ANC attendance and uptake of IPTp are given in table 11 below.

Table 11: Association between ANC attendance and uptake of IPTp.

Characteristic	Odds ratio	95% Confidence interval	P-value
ANC attendance			
1-4 (base)	1.00		
5 or more	9.55	5.82 – 15.68	<0.001
Age of pregnancy at first ANC attendance (weeks)			
First trimester	1.00		
Second trimester	0.61	0.40 – 0.93	0.022
Third trimester	0.06	0.01 – 0.46	0.007
Age of pregnancy at first ANC attendance (weeks)			
At 17 weeks (base)	1.00		
17-24 weeks	0.41	0.26 – 0.66	<0.001
25 weeks or more	0.06	0.01 – 0.46	0.007
When first dose of SP was taken			
Before 16 weeks			
At 16 weeks	0.17	0.02 – 1.37	0.096
17-24 weeks	0.13	0.02 – 1.05	0.056
25 weeks or more	0.01	0.00 – 0.10	<0.001

4.9 Multivariable analysis of association between independent variables and uptake of IPTp.

The Sub-District of residence of women attending Postnatal Clinic was significantly associated with uptake of IPTp at both the univariate and multivariable level. At the multivariable level; Helekpe (AOR: 3.68, ***p***=0.002), Waya (AOR: 4.72, ***p***=0.001), Wumenu (AOR: 5.26, ***p***=0.001) and Sofa Torda (AOR: 4.95, ***p***=0.006) sub-districts had increased odds of uptake of IPTp.

Being educated on IPTp was associated with 6.04 (***p***=0.017) increased odds of uptake at the multivariabe level. Additionally, experiencing undesirable side effects after taking SP was associated with 90% (AOR: 0.10, ***p***<0.001) reduced odds of uptake at the multivariable level.

ANC attendance of 5 or more was associated with 6.35 (***p***<0.001) increased odds of uptake as compared to ANC attendance of less than 5.

Reporting for ANC between 17 and 24 weeks was associated with 64% (AOR: 0.36, ***p***=0.005) reduced odds of uptake as compared to reporting before 17 weeks. Similarly, reporting after 24 weeks was associated with 95% (AOR: 0.05, ***p***=0.017) reduced odds of uptake compared with reporting before 17 weeks.

Details of multivariable analysis between independent variables and uptake of IPTp are shown in Table 12.

Table 12: Multivariable analysis of association between independent variables and uptake of IPTp

Characteristic	Crude odds ratio	95% CI	P-value	Adjusted odds ratio	95% CI	P-value
Sub-district						
Ahunda (base)	1.00					
Helekpe	1.23	0.66 – 2.30	0.508	3.68	1.60 – 8.50	0.002
Waya	6.11	3.09 – 12.11	<0.001	4.72	1.91 – 11.69	0.001
Wumenu	1.76	1.00 – 3.22	0.065	5.26	1.94 – 14.25	0.001
Sofa Torda	4.42	2.08 – 9.37	<0.001	4.95	1.58 – 15.50	0.006
Educational level						
No formal education (base)	1.00					
Primary education	3.29	1.69 – 6.41	<0.001	1.55	0.62 – 3.93	0.351
Secondary/vocational	2.99	1.48 – 6.68	0.002	1.54	0.56 – 4.20	0.399
Tertiary	4.44	1.70 – 11.64	0.002	2.29	0.57 – 9.17	0.241
Religion						
Christian (base)	1.00					
Islam	0.19	0.10 – 0.36	<0.001	0.46	0.18 – 1.20	0.112
Traditionalist	3.04	0.35 – 26.31	0.313	7.62	0.38–154.25	0.185
Educated on SP						
No (base)	1.00					
Yes	7.50	2.15 – 26.19	0.002	4.37	0.89 – 21.40	0.069

Characteristic	Crude odds ratio	95% CI	P-value	Adjusted odds ratio	95% CI	P-value
Knowledge of effects of malaria on a pregnant woman						
Anemia (base)	1.00					
Miscarriage	2.65	1.46 – 4.81	0.001	1.40	0.61 – 3.18	0.428
Death	0.96	0.40 – 2.30	0.921	0.91	0.31 – 2.70	0.867
ANC attendance						
1-4 (base)	1.00					
4 or more	9.55	5.82 – 15.68	<0.001	6.68	3.49 – 12.76	<0.001
Age of pregnancy at first ANC attendance (weeks)						
At 16 weeks(base)	1.00					
17-24 weeks	0.41	0.26 – 0.66	<0.001	0.36	0.18 – 0.74	0.005
25 weeks or more	0.06	0.01 – 0.46	0.007	0.05	0.00 – 0.59	0.017

AIC = 369.60, BIC = 440.29

CHAPTER FIVE

DISCUSSION, CONCLUSION, AND RECOMMENDATIONS.

5.1 Uptake of IPTp among women attending PNC

Findings from this study in 2022 in Adaklu District indicated a decreasing uptake of IPTp from 98% to 6.9% for IPTp 1 and IPTp 5. Although the uptake of IPTp 1 was high at 98%, it still fell below the NMCP national target of 100%. Not all the ANC units within all the Health facilities are managed by midwives who are authorized to administer the first dose of IPTp to pregnant women. There was also a reduction in uptake of subsequent doses of IPTp. This observed reduction in IPTp doses is consistent to what was observed by (Diengou et al., 2020) in Bamenda Health Districts in Cameroon. In their study, IPTp doses reduced from 95.3% to 54.9% for IPTp 1 and IPTp 3 whiles 4.8% did not receive any dose of IPTp. Similar trend in IPTp uptake was also observed by (Owusu-Boateng & Anto, 2017) in Ghana where 87.5%, 55.7% and 14.5% were recorded for IPTp 3, IPTp 4 and IPTp 5.

The observed 56.3% coverage of IPTp 3 in the District did not meet the national target of 80%. In Cameroon and Ghana, Diengou et al., 2020 and Oppong et al., 2019 observed a lower dose of 54.9% and 32.4% for IPTp 3. In Sierra Leone, Amos Buh, 2019 observed 93.24% in IPTp 3 coverage which is higher than what was observed in Adaklu. These differences in the coverages of IPTp dose may be due to different geographical settings. It may also be due to the study population used in the studies i.e. pregnant women and postnatal women. Results from table 6 indicates 40.7% of mothers attending postnatal clinic relied on motorcycle to access ANC

services. An amount of 10 cedis or more is spent to access PNC services as transportation fare. The reduction in IPTp 3 coverage could be due to mothers unable to afford 10 cedis or more to access ANC services as a result of low economic activities in the District. This could be due to the poor nature of road network within the District making 40.7% of respondent rely on motorcycle.

5.2 Socio demographic characteristics of mothers attending PNC

Educational levels of women attending postnatal clinic was found to be statistically significant to uptake of IPTp (OR-1.47 ***p***=0.001). Formal education (primary, secondary and tertiary level) increases uptake as compared to having no formal education. This is consistent with findings from a study by (Arnaldo et al., 2018). When compared to pregnant women who had never attended school, pregnant women with at least a formal education in Chokwe district, southern Mozambique were nearly twice as likely to receive higher IPTp doses. This is expected given that education might enable women to make better decisions regarding their health issues. A research conducted in Nigeria by Buh et al. (2019) found that women with greater education had a reduced likelihood of obtaining IPTp than women without education.

Occupation was significantly associated with uptake of IPTp. Being a farmer (OR: 1.82, p=0.046) or engaging in trading (OR:2.03, ***p***=0.007) had statistically significant increased odds of uptake as compared to being unemployed. Being employed could make one financially independent, thus easily cover ANC related expenses when the need arises.

Findings from the study revealed that, Muslims have a reduced odd of 81% uptake of IPTp. This is consistent with a study by Oppong et al., 2019 in Ghana which indicated that, being a Muslim has a reduced odd of 17% uptake of IPTp.

5.3 Client level factors associated with uptake of IPTp

Usage of motorcycle as mode of transportation to health facilities for ANC services was associated with 66% (p<0.001) reduced odds of uptake as compared to walking. This may be due the inconvenience of traveling on a motorcycle coupled with the discomfort associated with pregnancy could be the reason for this. Additionally, spending 10 to 19 Ghana cedis (OR: 0.45, p=0.004) and 20 Ghana cedis or more (OR: 0.29, p<0.001) on transportation to ANC had a statistically significant association with uptake as compared to spending zero Ghana cedis. Due to the complications and discomfort associated with pregnancy, most mothers are not able to work regularly to fend for their needs hence resulting in their inability to afford transportation fare of 10 cedis or more to the ANC clinic.

Education of pregnant mothers on SP resulted in 7.5 (p=0.002) increased odds of uptake of IPTp compared to when they are not. The source of information for pregnant mothers on SP was from Health care workers at the ANC unit. Pregnant mothers are more likelihood to receive more doses of IPTp in the Bunoma East District in Kenya, with their main source of information on SP for pregnant women being radio compared to pregnant mothers with sole dependence on community healthcare workers at the ANC unit as their main source of information (Chepkemoi et al, 2014).

Women attending postnatal care who made 5 or more visits to the ANC when pregnant was associated with 9.55 (***p***<0.001) increased odds of uptake of IPTp compared to women who made ANC between 1 and 4 visits. This affirms the claim made by Odjidja, Kwanin, and Saha (2017) that the optimal uptake of IPTp in Ghana was influenced by frequent visits to ANC clinics, products and finances.

Pregnant women whose first first dose of SP was at 25 weeks or more, resulted in 99% (p<0.001) reduced uptake when compared with taking the first dose at 16 weeks. The total number of IPTp doses that can be given out is reduced by late ANC registration. In a study conducted in Cameroon by Anchang-Kimbi et al. (2014), it was shown that a greater percentage of women with their first visit occurring in the third trimester only received one dose (***p***< 0.001), while women who attended their first ANC appointment earlier were more likely to receive two or more doses (OR = 0.4; 95% CI = 0.2 - 0.7).

5.4 Healthcare worker factors associated with uptake of IPTp

Whiles 72.5% indicated that the first dose of SP is given at 16 weeks, the rest indicated that it is given when the woman experiences quickening (first movements of fetus). The new policy by NMCP on IPTp proposes the first dose be given at 16 weeks of gestation ("Ghana Malar. Indic. Surv.," 2019). Healthcare workers who rely solely on quickening before administering IPTp might issue the drug late (after 16 weeks) which may reduce the number of the number of doses a pregnant woman can receive. Table 5 revealed 98.6% of mothers have heard of SP at the ANC and its importance which proves that health workers educate mothers on SP at the facility level.

This may be due to all healthcare workers (100%) trained in IPTp and malaria hence are well resourced to educate mothers on IPTp and malaria.

5.5 Health facility factors associated with uptake of IPTp

All the 17 health facilities visited had job aids on IPTp and malaria pasted at the ANC unit, observed the DOT policy, recorded IPTp administered to pregnant women in the ANC registers and maternal and child booklet, had adverse reaction forms in the ANC unit, had not experienced any shortage of SP within the past 6 months. This may have been the reason for health workers having high level of knowledge on IPTp and malaria as shown in table 7 since they have access to job aids and protocols to aid in their work delivery.

5.6 Strength of the study

This study seems to be the first to be conducted the Adaklu District since its inception in 2013 per the literatures reviewed. It therefore sets the platform for similar studies to be conducted in the District. This gives the Adaklu District Health Directorate the opportunity to implement measures to increase uptake of IPTp depending on the issues identified.

Additionally, the study provides GHS and its implementing partners with the opportunity to address nationwide challenges with uptake of IPTp.

5.7 Limitation of the study

A qualitative aspect would have enhanced the study. This would have thrown additional insight on the aspects of the healthcare system influencing uptake of IPTp. The experiences and

difficulties women attending PNC encountered when accessing ANC services when they were pregnant would have also been helpful.

5.8 Conclusion

The observed 56.3% uptake for IPTp 3 did not meet the national target of 80%. Postnatal women who used motorcycle as mode of transportation to health facilities for ANC services during pregnancy was associated with 66% ($p < 0.001$) reduced odds of uptake of IPTp. Formal education (primary, secondary and tertiary level) increased uptake of IPTp (OR-1.47 $p = 0.001$). Women attending PNC who made 5 or more visits to the ANC when pregnant was associated with 9.55 ($p < 0.001$) increased odds of uptake of IPTp. All the HCWs involved in rendering ANC services interviewed in ANC facilities had been trained in IPTp. The 17 health facilities visited had job aids on IPTp and malaria pasted at the ANC unit, observed the DOT policy, recorded IPTp administered to pregnant women in the ANC registers and maternal and child booklet, had adverse reaction forms in the ANC unit and had not experienced any shortage of SP within the past 6 months.

5.9 Recommendations

The following recommendations are made based on the findings of the study.

The Adaklu District Health Directorate should:

1. Support HCWs to intensify education on Malaria in Pregnancy, IPTp and the importance of attending ANC to pregnant women in health facilities and communities.

2. Conduct periodic supervisions to Health facilities to ensure HCWs are adhering to ANC and IPTp protocols.

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APPENDIX 1: INFORMED CONSENT FORM

SCHOOL OF PUBLIC HEALTH

UNIVERSITY OF GHANA

Project Title: Factors associated with uptake of Intermittent Preventive Treatment in Pregnancy in Adaklu district.

Principal Investigator: Raphael Worlanyo Akpah.

Address: Department of Epidemiology and Disease Control, School of Public Health, College Of Health Sciences, University of Ghana, Legon

Background

I am a Master of Public Health student from the School of Public Health, University of Ghana. I am conducting a study on Factors associated with uptake of Intermittent Preventive Treatment in Pregnancy in Adaklu district.

The aim of the study is to assess the facilitators of and barriers to uptake of IPTp so that the district health directorate and other policy makers can improve upon the uptake in Adaklu and other parts of the country.

Anonymity and confidentiality

Any information you will provide will be treated with strict confidentiality and will be used solely for research purposes. No one who is not involved in this study will have access to your responses.

To ensure anonymity, data analysis will be done at the aggregate level and your responses will not be traced to you.

Costs/payments to subject for participation in research

There will be no costs for participating in the research. You will not be compensated for

participating in this study. Any questions concerning the research project should be directed to **Dr. Priscilla Nortey**, School of Public Health (0208181120), **Raphael Worlanyo Akpah** (0544736253) or rwakpah001@st.ug.edu.gh and Nana Abena Apatu, Administrator, Ghana Health Service Ethics Review Committee on 0503539896 or by email on ethics.research@ghsmail.org

PARTICIPANTS' STATEMENT

I acknowledge that I have read or have had the purpose and contents of the Participants' Information Sheet read and all questions satisfactorily explained to me in a language I understand (……*name of language*). I fully understand the contents and any potential implications as well as my right to change my mind (i.e. withdraw from the research) even after I have signed this form.

I voluntarily agree to be part of this research.

Name of Participant……..

Participants' Signature……...OR Thumb Print……

Date:……

INTERPRETERS' STATEMENT

I interpreted the purpose and contents of the Participants' Information Sheet to the afore named participant to the best of my ability in the (……..*name of language*) language to his proper understanding.

All questions, appropriate clarifications sort by the participant and answers were also duly interpreted to his/her satisfaction.

Name of Interpreter……

Signature of Interpreter…….. OR Thumb Print …….....

Date:……

Contact Details:……

STATEMENT OF WITNESS

I was present when the purpose and contents of the Participant Information Sheet was read and explained satisfactorily to the participant in the language he/she understood (……*name of language*)

I confirm that he/she was given the opportunity to ask questions/seek clarifications and same were duly answered to his/her satisfaction before voluntarily agreeing to be part of the research.

Name:……

Signature…….... OR Thumb Print …….....

Date:……

INVESTIGATOR STATEMENT AND SIGNATURE

I certify that the participant has been given ample time to read and learn about the study. All questions and clarifications raised by the participant have been addressed.

Researcher's name…….

Signature …….

Date…….

APPENDIX 2: QUESTIONNAIRE

SCHOOL OF PUBLIC HEALTH

UNIVERSITY OF GHANA

My name is **Raphael Worlanyo Akpah**, a **MASTER OF PUBLIC HEALTH** student from the University of Ghana, Legon. I am conducting a study on the factors associated with uptake of Intermittent Preventive Treatment in Pregnancy in Adaklu district.

The aim of the study is to improve uptake of IPTp in Adaklu district and other parts of the country in order to reduce deaths and sickness associated with malaria among pregnant women.

Any information you provide will be treated confidentially and will be used solely for the purpose for which it is being collected – academic work. Thus, your responses will not be shared with anyone who is not part of the team involved in the study. Data will be analyzed at the aggregate level and your responses will not be traced to you.

Thank you.

Date of interview……

Sub-district: ……

Community……

Interviewer……..

No.	Question	Response (write and/or tick as appropriate)	Code
QUESTIONNAIRE FOR MOTHERS ATTENDING POSTNATAL CARE.			
PART A: SOCIO-DEMOGRAPHIC CHARACTERISTICS.			
1.	1. Parity: No of live births		
2.	2. Age at last birthday		
3.	Highest education level	No formal education	0
		Primary education	1
		Secondary/ Vocational	2
		Tertiary education	3
4.	What is your marital status?	Single	1
		Married	2
		Cohabiting	3
		Divorced	4
		Widow	5
5.	Occupation	Unemployed	0
		Formal Worker	1
		Farming	2
		Trading	3
		Others	7
6.	Religious affiliation	Christianity	1
		Islam	2
		Traditionalist	3
		Others	7
7.	7. Highest level of education of partner	No formal education	0
		Primary education	1
		Secondary/Vocational	2
		Tertiary	3
8.	8. Religious affiliation of partner	Christianity	1

		Islam	2
		Traditionalist	3
		Others	7
PART B: CLIENT LEVEL RELATED FACTORS			
9.	How long does it take you to get to the antenatal clinic?		
10.	What is your main mode of transportation to the antenatal clinic?	Walking	1
		Motorcycle	2
		Car	3
		Others	7
11.	How much does it cost you to travel to the antenatal clinic?		
12.	How will you describe the attitude of health care workers who attended to you at antenatal clinic while pregnant?	Excellent	1
		Very Good	2
		Good	3
		Poor	4
		Very Poor	5
13.	How many times did your partner accompany you to clinic for antenatal services while pregnant?		
14.	Have you ever heard about the medicine (SP) given to pregnant women to protect them against malaria when they visit the antenatal clinic?	Yes	1
		No	0
15.	If yes, where did you first hear about it?	Antenatal Clinic	1
		Friends/Family	2
		Others	7
16.	Were you educated on the medicine (SP) at the antenatal clinic while pregnant?	Yes	1
		No	0
17.	Were you given the medicine (SP) to	Yes	1

	swallow under the supervision of the healthcare worker at antenatal?	No	0
18.	If no, please specify		7
19.	Have you ever experienced any adverse reaction after taking the medicine (SP)?	Yes	1
		No	0
20.	If Yes, what adverse reaction did you experience? (tick all that may apply)	Nausea	1
		General Malaise	2
		Dizziness	3
		Others	7
21.	Did the side effect prevent you from taking subsequent doses?	Yes	1
		No	0
22.	Were you required to make any payments for the medicine (SP) served at the antenatal clinic?	Yes	1
		No	0
23.	If yes, how much? ..... cedis		
24.	Were you provided with water to take the medicine (SP) at the antenatal clinic?	Yes	1
		No	0
25.	How much did you pay for the water? ..... cedis.		
26.	Did you ever report to the health facility with feverish symptoms while pregnant?	Yes	1
		No	0
27.	If Yes to Q26, did the worker tell you that you had malaria after attending to you at the health facility?	Yes	1
		No	0
28.	If Yes to Q29 many times did you get malaria while pregnant?.....		
29.	What is/are the effects of malaria on the pregnant woman? (tick all that may apply)	Anemia	1
		Miscarriage	2

		Death	3
		Others	7
30.	What is/are the effects of malaria on the unborn baby? (tick all that may apply)	Low Birth Weight	1
		Deformity	2
		Death	3
		Others	7
PART C: QUESTIONNAIRE FOR HEALTHCARE WORKERS.			
31.	Cadre of Health worker	Midwife	1
		Enrolled Nurse	2
		Community Health Nurse	3
		Registered General Nurse	4
		Others	7
32.	Number of years of practice in conducting antenatal clinic		
33.	What is Intermittent Preventive Treatment of malaria in pregnancy (IPTp)?	A prophylactic regimen of antimalarial medicine (SP) for pregnant women to protect them against malaria.	1
		Treating pregnant mothers with ACTs during pregnancy	2
		Others	7
34.	When is Intermittent Preventive Treatment in Pregnancy supposed to be started during pregnancy?	At registration	1
		16 weeks of gestation	2
		Quickening	3
		Others	7
35.	What is the recommended drug for Intermittent Preventive Treatment in Pregnancy in Ghana?	Artemether Lumefantrine	1
		Artesunate Amodiaquine and Sulfadoxine Pyrimethamine	2
		Sulfadoxine Pyrimethamine	3
		Others	7

36.	At what interval is Intermittent Preventive Treatment in Pregnancy given?	Every 2 weeks	1
		Monthly	2
		Every 2months	3
		Others	7
37.	How many times is Intermittent Preventive Treatment in Pregnancy given in Ghana?.....		
38.	Do you think Intermittent Preventive Treatment in Pregnancy is effective against malaria?	Yes	1
		No	0
39.	Have you being trained in Intermittent Preventive Treatment in Pregnancy?	Yes	1
		No	0
PART D: CHECKLIST FOR OBSERVATION.			
40	Number of antenatal care visit while pregnant		
41	Age of pregnancy when mother started antenatal care clinic while pregnant		
42	Age of pregnancy when mother took first dose of Sulfadoxine Pyrimethamine at antenatal		
43	How many doses of Sulfadoxine Pyrimethamine did mother take at the antenatal clinic while pregnant		
44	G6PD Defect	Yes	1
		No	0

APPENDIX 3 – GHANA HEALTH SERVICE ETHICAL CLEARANCE

GHANA HEALTH SERVICE ETHICS REVIEW COMMITTEE

In case of reply the number and date of this Letter should be quoted.

Research & Development Division
Ghana Health Service
P. O. Box MB 190
Accra
Digital Address: GA-050-3303
Mob: +233-50-3539896
Tel: +233-302-681109
Email: ethics.research@ghs.gov.gh

My Ref. GHS/RDD/ERC/Admin/App /22/528
Your Ref. No.

31st October, 2022

Raphael Worlanyo Akpah
Adaklu District Health Directorate
Post Office Box HP 1343, Ho.

The Ghana Health Service Ethics Review Committee has reviewed and given approval for the implementation of your Study Protocol.

GHS-ERC Number	**GHS-ERC: 047/09/22**
Study Title	Factors Associated with Uptake of Intermittent Preventive Treatment in Pregnancy in Adaklu District
Approval Date	31st October, 2022
Expiry Date	30th October, 2023
GHS-ERC Decision	**Approved**

This approval requires the following from the Principal Investigator

- Submission of a yearly progress report of the study to the Ethics Review Committee (ERC)
- Renewal of ethical approval if the study lasts for more than 12 months,
- Reporting of all serious adverse events related to this study to the ERC within three days verbally and seven days in writing.
- Submission of a final report after completion of the study
- Informing ERC if study cannot be implemented or is discontinued and reasons why
- Informing the ERC and your sponsor (where applicable) before any publication of the research findings.

You are kindly advised to adhere to the national guidelines or protocols on the prevention of COVID -19

Please note that any modification of the study without ERC approval of the amendment is invalid.

The ERC may observe or cause to be observed procedures and records of the study during and after implementation.

Kindly quote the protocol identification number in all future correspondence in relation to this approved protocol

SIGNED.....
Dr. Naa-Korkor Allotey
(Ag. Head, Ethics & Research Management Department)

Cc: The Director, Research & Development Division, Ghana Health Service, Accra