

ENSIGN COLLEGE OF PUBLIC HEALTH-KPONG
EASTERN REGION-GHANA

FACTORS CONTRIBUTING TO LOW IPT_{p3+} UPTAKE IN THE
BIAKOYE DISTRICT OF THE VOLTA REGION OF GHANA

A THESIS SUBMITTED TO THE DEPARTMENT OF COMMUNITY HEALTH
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD
MASTER OF PUBLIC HEALTH

BY

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DEDICATION

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LIST OF ABBREVIATIONS

ACT	Artemisinin-based Combination Therapy
CDC	Centre For Disease Control
CHN	Community Health Nurse
CHPS	Community-Based Health Planning and Services
CWC	Child Welfare Clinic
DDHS	District Director Of Health Services
DHIMS	District Health Information Management System
DHMT	District Health Management Team
DOT	Direct Observation Therapy
GHS	Ghana Health Service
GSS	Ghana Statistical Service
IPTp	Intermittent Preventive Treatment in pregnancy
IRS	Indoor Residual Spraying
ITN	Insecticide Treated Net
JHS	Junior High School
LBW	Low Birth Weight
MDGs	Millennium Development Goals
MHD	Municipal Health Directorate
MIP	Malaria in Pregnancy
MOH	Ministry of Health
NMCP	National Malaria Control Program
PMI	President Malaria Initiative
RBM	Roll Back Malaria
SDGs	Sustainable Development Goals
SHS	Senior High School
SP	Sulfadoxine-Pyrimethamine
UN	United Nations
USAID	United States Agency For International Development
WHO	World Health Organization

OPERATIONAL DEFINITIONS

IPT: The administration of anti-malarial drugs in treatment doses at predefined intervals to clear a presumed burden of parasites. IPT of malaria during pregnancy (IPTp) 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.

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

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

IPT3+: The number of respondents who received at least three (3) doses of SP during pregnancy.

ANC attendant: A pregnant woman who attended antenatal clinic during pregnancy

Adequate ANC visit: A respondent who attended antenatal clinic for care at least four (4) times

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

UPTAKE OF IPTp: The implementation of the IPTp program by the service providers resulting in pregnant women at the antenatal clinics (ANCs) taking Sulphadoxine-Pyrimethamine under direct observation. It is expected that at the end of the process, every pregnant woman of 36 weeks gestation and above would have received at least 3-5 doses of SP at not less than monthly intervals under direct observation by a qualified health personnel.

ABSTRACT

Malaria infection during pregnancy is a major public health problem, with substantial risks for the mother, her foetus and the new-born.(PATH, 2014b). In Ghana, the proportion of OPD cases attributed to malaria in pregnancy 2.7%, 6.7% of admissions and 1% deaths in 2014.

In areas with moderate to high transmission of Plasmodium falciparum, the World Health Organization (WHO) recommends the administration of intermittent preventive treatment with sulfadoxine-pyrimethamine (IPTp-SP) by pregnant women as part of package of interventions for controlling malaria and its effects during pregnancy, which also includes the promotion and use of insecticide-treated nets (ITNs) and appropriate case management through prompt and effective treatment of malaria in pregnant women.(WHO, 2014).

This main objective of this research is to ascertain the contributory factors to low IPTp3+ in the Biakoye district of the Volta region of Ghana.

Methodology

A cross-sectional study was conducted, where women within one year postpartum and attended antenatal in the Biakoye District were interviewed using a structured questionnaire. A sample size of 384 women was involved in the survey and STATA[®] software used to analyse and present the results in tables and graphs.

Results

The research found that 81.09% of respondents visited antenatal clinic four (4) or more times and 99% visited antenatal care clinic once. About 64.2% of respondents registered in the first trimester giving them the opportunity to attain adequate ANC visit and 76.1% of mothers said they were satisfied and 18.7% very satisfied.

On Malaria transmission, 84.62% of respondents adequately identified the mosquito to be responsible for malaria transmission and 75.8% displayed adequate knowledge on the importance of IPTp in pregnancy; of these 53.41% said it prevents malaria, 18.3% said it treats malaria.

The study revealed that 54% of respondents had adequate IPTp uptake (that is, more than three (3) doses). And finally the following were the factors that really affected IPTp3+ uptake:

- Women below twenty six (26) years showed low (48.19%) uptake of IPTp3+
- Attending lower health care facilities (Health Centres) was shown to adversely affect IPTp3+ uptake (48.85%) as compared to attending hospital (51.15%).
- Women with higher education were 66% more likely to have adequate IPTp than those with no education (30%) or Low (58.26%) educational level.
- Occupation; Women in the formal sector were shown (55.56 %) not to do so very well in adequate IPTp uptake.

Conclusion

As has been demonstrated by the findings of this study, the interventions to encourage women to attend ANC has been very successful. This strategy should be sustained and improved in areas where they fall short, especially at the smaller facilities. The gains made in ANC attendance have however not translated into an equally impressive level of IPTp3+ uptake.

To address this challenge, a more targeted approach to the various interventional strategies should be undertaken, by focusing more on identified vulnerable segments of the people including young pregnant women and those women who are economically and socially disadvantaged.

CHAPTER ONE

1 INTRODUCTION

Malaria in pregnancy is a public health issue that affects both mother and baby. Malaria in pregnancy is an obstetric, social and medical problem of all over the world particularly in tropical and sub-tropical countries. The WHO describes malaria as a disease of poverty and also causes poverty. Each year, approximately 25 million African women become pregnant in malaria-endemic areas and are at risk of *Plasmodium falciparum* malaria infection during pregnancy (WHO, 2016).

In Ghana, malaria in pregnancy accounted for about 17.6% of OPD attendance, 13.7% of admissions and 3.4% of maternal death. (NMCP, GHS, 2015)

Malaria in pregnancy is mostly caused by *Plasmodium falciparum* infection in Africa. In cases where mothers have high immunity, parasites can stay in the placenta and cause maternal anemia, even when mothers have tested negative using the rapid diagnostic test (World Health Organisation, 2016). Other causes of malaria include *P. malariae*, *P. ovale*, *P. vivax* and newly found in Asia, *P. knowlesi*.

With mothers with low immunity towards the malaria parasites, they easily acquire the infection, leading to increasing risk of severe malaria, and other complications to be discussed below. (World Health Organisation, 2016).

1.1 Consequences of Malaria in Pregnancy

Most women in the African Region reside in areas of relatively stable malaria transmission where the principal effects of malaria infection during pregnancy are associated with malaria-related anaemia in the mother and with the presence of parasites in the placenta. The resultant

impairment of foetal nutrition contributes to low birth weight (LBW), which is a leading cause of poor infant survival and development in Africa.(World Health Organisation, 2016)

In these areas, pregnant women may die as a direct result of severe malaria or as an indirect result of malaria-related severe anaemia. In addition, malaria infection of pregnant women may result in a range of adverse outcomes, including spontaneous abortion and neonatal death.(World Health Organisation, 2016)

1.2 Interventions to Control Malaria in Pregnancy

The World Health Organization (WHO) currently recommends a multi-pronged approach for malaria prevention and control during pregnancy, which includes i) use of insecticide-treated nets (ITNs) beginning as soon as possible during pregnancy, ii) distribution of intermittent preventive treatment of malaria in pregnancy using sulfadoxine-pyrimethamine (IPTp-SP) and iii) prompt diagnosis and effective case management of malaria.(PATH, Policies and actions for improved Malaria in Pregnancy efforts in communities, 2014)

It is recommended that Insecticide-treated nets be provided to pregnant women as early in pregnancy as possible. Women should be encouraged to use ITNs throughout the entire pregnancy period, as well as during the postpartum period when the risk of malaria is also increased. IPTp-SP is not a replacement for ITN use; both interventions provide important benefits.(WHO, 2014)

Insecticide-treated mosquito nets (ITNs) used for protection against mosquito bites have proven to be a practical, highly effective, and cost-effective intervention against malaria. The evidence of the public health impact of ITNs, supporting their wide-scale use in Africa, is drawn from areas of stable malaria transmission where *Plasmodium falciparum* infection prevalence in the

community is often over 40%. Community-based randomized controlled trials (RCT) in these regions have documented average reductions of 20% in all causes of mortality in children under 5 years old within 2 years of increasing ITN use from 0 to 50-70.

Scaling up ITN coverage and use by young children and pregnant women has been made a consensus target of the Millennium Development Goals (MDGs), the Roll Back Malaria Partnership (RBM), and the US President's Malaria Initiative (PMI). Targeting individual protection to these vulnerable groups is a well-founded and explicitly accepted priority of all three initiatives because these groups bear the highest risk of morbidity and mortality from malaria. (<https://parasitesandvectors.biomedcentral.com/articles/10.1186/1756-3305-4-113>, accessed on 13/01/17)

Artemisinin-based combination therapy (ACT) is recommended by the WHO to treat uncomplicated malaria. Artemisinin is derived from the plant *Artemisia annua*, better known as sweet wormwood, and is known for its ability to reduce quickly the number of *Plasmodium* parasites in the bloodstream.(WHO, 2014).

For pregnant women diagnosed with uncomplicated malaria caused by *P. malariae*, *P. vivax*, *P. ovale*, or chloroquine-sensitive *P. falciparum* infection, prompt treatment with chloroquine (treatment schedule as with non-pregnant adult patients) is recommended. Alternatively, hydroxychloroquine may be given instead. For pregnant women diagnosed with uncomplicated malaria caused by chloroquine-resistant *P. falciparum* infection, prompt treatment with either mefloquine or a combination of quinine-sulfate and clindamycin is recommended. Quinine treatment should continue for 7 days for infections acquired in Southeast Asia and for 3 days for infections acquired elsewhere; clindamycin treatment should continue for 7 days regardless of where the infection was acquired. For pregnant women diagnosed with uncomplicated malaria

caused by chloroquine-resistant *P. vivax* infection, prompt treatment with mefloquine. (WHO, 2014)

Intermittent preventive treatment for malaria in pregnancy (IPTp) was introduced to prevent all the complications that comes as a result of malaria infection in pregnancy. It is therefore important that it is appropriately used.(World Health Organisation, 2016)

WHO recommended that all pregnant women be given IPTp with sulfadoxine-pyrimethamine (IPTp-SP) at each scheduled antenatal care visit starting as early as possible in the second trimester.(WHO, 2014)

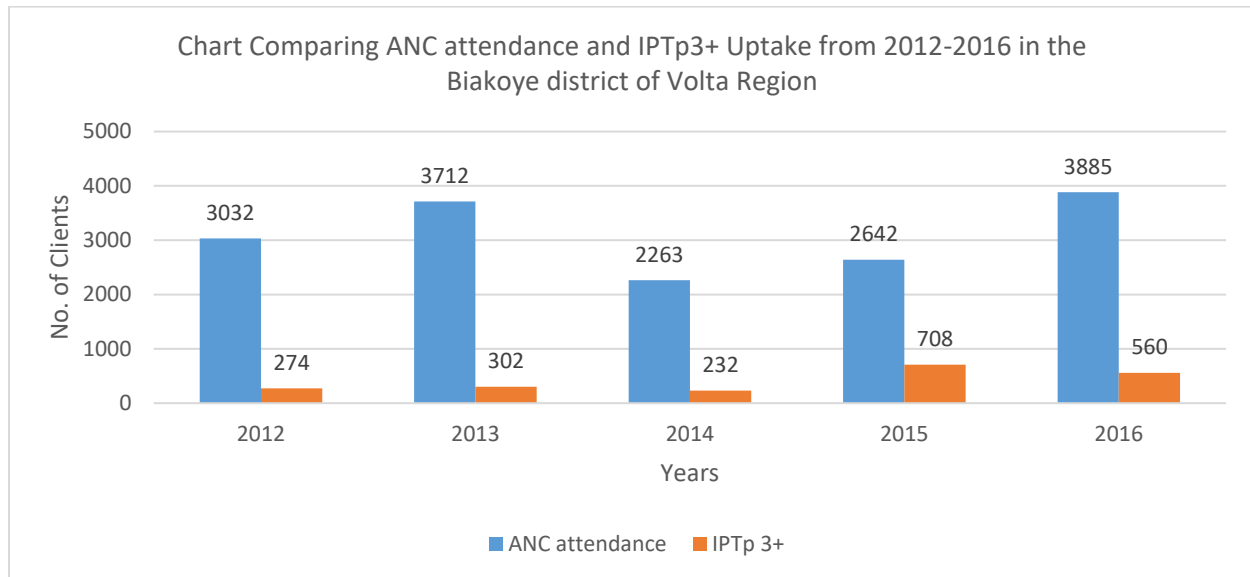
IPTp-SP remains effective in preventing complications from maternal malaria based on current available evidence. (WHO, 2014)

Intermittent preventive treatment for prevention of malaria in pregnancy (IPTp) is a key component of the malaria control strategy in Africa as a study carried out in Gabon realized that the prevalence of *p. falciparum* infection decreased drastically after the institution of the IPTp. (Bouyou-Akotet, Mawili-Mboumba, & Kombila, 2013)

Among 840 million people at risk of malaria in sub-Saharan Africa, 35 million pregnant women could benefit from IPTp each year. However, during the last few years a decline has been observed in its use in a number of African countries of which Ghana is one of them.(Bouyou-Akotet et al., 2013)

In 2016, despite a 47% increase in antenatal clinic attendance in the Biakoye district IPTp3+ uptake declined by 20 %.(GHS, DHIMS 2017). This observation highlighted a serious problem with the uptake of IPTp3 in the district and the need for appropriate interventions to curb and reverse the trend.

Figure 1.1: IPTp3+ Utilization in the Biakoye District



Source: GHS, DHIMS, 2017

1.3 Conceptual Framework

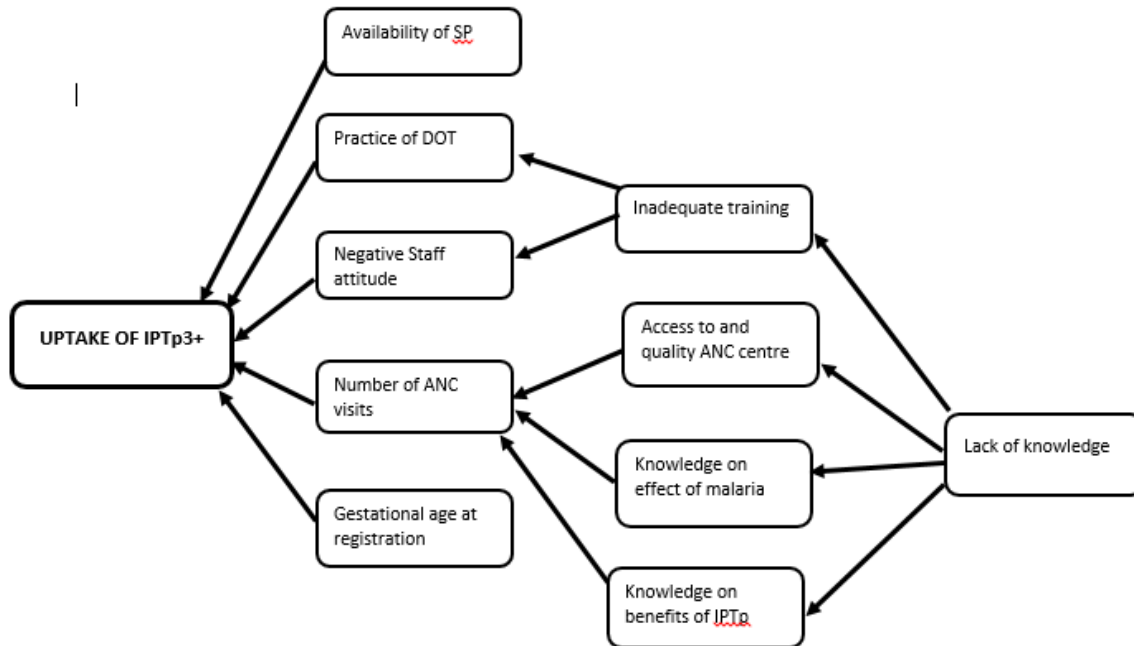
The conceptual framework gives a general overview of some of the factors that contribute to the uptake of IPTp3+ among pregnant women in the district and how these factors are linked to each other. It portrays the context within which this study was conducted.

The framework look at the determinants of IPTp3+ uptake from two paradigms; staff related effect and clients related effect. This allowed for a thorough interrogation of all the possible contributors to IPTp3+ uptake in the Biakoye District.

The staff-related factors examined included, staff attitude, appropriate staff training, and availability of medicine and requisition procedures. These enabled the assessment of the effect of this vital component of the program on its outcome.

On the other hand, clients related factors looked at included; age of gestation at registration, level of education, location, occupation and knowledge on malaria in pregnancy. These was done to

ascertain how the demographic and social situation of the pregnant women can influence the outcome of the IPTp program.



Source: Secorm, 2017

1.4 Research Questions

1. What population of women are able to receive the recommended doses of SP during their pregnancy?
2. What do pregnant women in the Biakoye District know about IPTp?
3. What do pregnant women in the Biakoye District know about malaria in pregnancy?
4. At what gestational age do pregnant women generally first attend ANC?
5. Are pregnant women satisfied with the services generally received at the ANC?

1.5 Main objective

To determine the factors contributing to low IPTp3+ uptake in the Biakoye district of the Volta Region of Ghana.

1.6 Specific objectives

1. To determine the factors influencing IPTp3+ uptake
2. To ascertain the knowledge of mothers on malaria in pregnancy
3. To ascertain the knowledge of mothers on IPTp for malaria prevention in pregnancy
4. To assess attitude of pregnant mothers towards Antenatal care

1.7 Rationale for the study

The IPTp programme has been introduced in all the districts in the Volta Region since 2005 with all pregnant women expected to take at least three doses of the SP (that is IPT1, IPT2, and IPT3).

However, over the years the attendance to antenatal clinics across Sub-Sahara Africa was quite high (median 88.4%), yet, coverage of intermittent preventive treatment was abysmal, with a median coverage of 17.8%. As the investigators note, uptake of intermittent preventive treatment in pregnancy might be affected by multiple factors, including health-worker confusion about timing of doses, drug stock outs, late attendance at antenatal clinics, and provider underachievement. In a study by Sangaré and colleagues, 15 missed opportunities for intermittent preventive treatment with sulfadoxine– pyrimethamine were reported in nearly 70% of women attending an antenatal clinic. The main reasons were that the drug was not offered to 35% of women and 49% did not know about it to ask.¹⁵ Stock outs led to only 5.6% of the missed doses. These findings suggest that barriers to improvement in intermittent preventive treatment coverage can be overcome by improved health-worker training and targeted health promotion. Interventions such as provision of clear and simplified instructions to health-care

providers about when to give such treatment might be associated with increased uptake. (Gutman & Slutsker, 2011)

Since 2005 when the program was introduced there has not been any study to determine the factors that influence the uptake of IPTp3+ in the Biakoye District. Thus, this study will be of great help to the District Health Management Team (DHMT) and Ghana health service in general to improve upon the uptake of IPTp in the district. It can also be used by other districts to improve the uptake of IPTp3+.

This study will also serve as a monitoring and evaluation framework to assess the quality of the various aspects of the program implementation in the district. Ultimately the study will contribute to reducing maternal and neonatal morbidity and mortality due to malaria during pregnancy and its complications.

CHAPTER TWO

2 LITERATURE REVIEW

2.1 Introduction

This chapter deals with the review of relevant literature to the study. It assesses research done in the area of antenatal attendance, malaria in pregnancy, interventions and their effectiveness and intermittent Preventive Treatment of Malaria specifically.

2.2 Malaria in Pregnancy

Malaria in pregnancy is the infection of the pregnant woman with *Plasmodium* parasite.

Malaria in pregnancy is of significant public health importance and it can affect the health of the pregnant women as well as the foetus.(WHO, 2014)

In very highly endemic regions, the commonest cause of severe and life-threatening malaria in pregnant women is *Plasmodium falciparum* which is also the commonest cause of severe malaria in the general populace causing 90% to 98% of malaria infections. (Ghana Health Service, 2009)

Pregnant women are more vulnerable and susceptible in acquiring malaria and then about 3 times more likely to suffer from severe malaria(Lincetto, Mothebesoane-anoh, Gomez, & Munjanja, 2013)

There are several factors that make pregnant women more susceptible and these include sequestration of the parasites in the placenta. The parasitized cells in the placenta express a variance of the surface antigen which makes it difficult to detect and mount appropriate, effective and timely immunity against them. There are changes in the cellular immunity in pregnancy and this delays or reduces immunity. (GHS, National Malaria Control Programme, 2015)Two main factors are being hypothesised to be the main causes of sequelae of malaria in

pregnancy and they are the immunocompromised state of pregnancy and placenta sequestration of infected erythrocytes. (WHO, 2014)

There are several complications of malaria in pregnancy stemming from the immunocompromised state of pregnancy which also affect the pathogenesis of malaria in pregnancy. A trial was conducted in 2008 in Pakistan which revealed the following: 62% of patient with malaria had haemoglobin concentration of 8-10g/dl and 38% less than 8g/dl. 2% had cerebral malaria, 30% developed puerperal pyrexia, 14% had spontaneous abortion 11% of babies of infected mothers died in neonatal period and 6% had pre-term labour (Rajiv Kumar Gupta, Tajali Nazir Shora, Aruna K. Verma, 2015). Other complications include low birthweight, prematurity, foetal death, acute pulmonary oedema, disseminated intravascular coagulation and this carries a high mortality risk. (World Health Organization, 2015) These symptoms and complications of malaria in pregnancy vary according to malaria transmission intensity in the given geographic area, and the individual's level of acquired immunity. (WHO, 2014)

Following from the above it is imperative to look at the various interventions for malaria control in pregnancy, assess their effectiveness and then narrow it to IPTp and then the factors affecting IPTp uptake which is a very important intervention in malaria control in pregnancy

2.3 Policies, Strategies and Targets of Malaria Prevention in Pregnancy

The general interventions for malaria control will apply generally to controlling malaria in pregnancy too. The WHO prescribes a three pronged approach to controlling malaria in pregnancy: IPTp-SP during the 2nd and 3rd trimester, sleeping under an ITN, and prompt case management among pregnant women with symptoms of malaria. (Partnership, Rollback malaria 2012)

2.3.1 Use of ITNs

Insecticide treated use is important in preventing malaria in pregnancy and other vulnerable groups. The ITNs provide physical barrier as well as having certain chemicals like permethrin (synthetic pyrethroids) which can either repel or actually kill insects like mosquitoes before they get chance to bite. Insecticide treated nets were introduced for use in Ghana in 1998. (GHS, National Malaria Control Programme, 2015) Despite its potential to reduce malaria in pregnancy, ITNs have not been widely used. A randomised control trial in Kenya in 2003 showed that ITNs were associated with 38% (95% confidence interval [CI]=17-54%) reduction in malaria parasitaemia, 47% reduction in the incidence of severe malarial anaemia and the prevalence of placental or maternal malaria reduced by 35% and prevalence of low birth weight reduced by 28%. (PATH, 2014a) Another trial showed a reduction in placental malaria in those who used ITN and those who did not use (relative risk (RR) 0.79, 95% CI. According National Malaria control programme in Ghana in 2008, only 32.3% of pregnant women actually use ITNs. Another cross-sectional in Kenya showed that despite ITN ownership reaching over 71%, compliance was low at 56.3%. (WHO, 2014) (Prevention, n.d.)(GHS, National Malaria Control Programme, 2015)The factors influencing ITN usage were the household structure and the decision by men or husbands (van Spronsen, Schneider, & Atsigie, 2012) ITNs distribution has increased over the years

2.3.2 Malaria case management in pregnancy

Malaria case management in pregnancy is very important as timely diagnosis is important in preventing severe malaria and also the fact that some of the physiological symptoms of pregnancy could be similar to symptoms of malaria and might lead to delayed detection of malaria.

Adequate treatment could lead to clearing parasites and reduce transmission to vulnerable groups such as pregnant women. The rational use of an effective anti-malarial not only reduces the risk of severe disease and death and shortens the duration of the illness, but also contributes to slowing down the development of the parasite's resistance.(MOH-Ghana, n.d.)

The WHO recommends that pregnant women in the second and third trimester be treated with uncomplicated malaria should be treated with artemisinin-based combination. It's recommended that quinine or quinine in combination with clindamycin be used in the first trimester.

(<http://www.who.int/malaria/publications/atoz/978>)

Severe malaria in pregnancy is life threatening and is an obstetric emergency that requires prompt antimalarial and supportive management. Parenteral quinine is recommended in the first trimester while parenteral artesunate is recommended in the second and third trimester. A study in Mozambique suggests adequate diagnosis before giving antimalaria as symptomatic treatment alone as about a third of those with symptoms were actually parasitaemic(Ghana Health Service, 2009)

2.3.3 Intermittent preventive treatment of malaria in pregnancy

IPTp is a public health intervention to treat and preventing malaria episodes in pregnant women.

IPTp is a full therapeutic course of antimalarial medicine given to pregnant women at routine antenatal care visits, regardless whether the recipient is infected with malaria. (World Health Organisation, 2016)

IPTp reduces maternal malaria episodes, maternal and foetal anaemia, placental parasitaemia, low birth weight, and neonatal mortality

The drug of Choice for Intermittent Preventive Treatment (IPT) Sulphadoxine Pyrimethamine (Sulphadoxine 500mg +Pyrimethamine 25mg) shall be reserved for Intermittent Preventive Treatment (IPT) given under DOT. Malaria Policy Advisory Committee advised that frequent dosing of IPTp-SP is effective in reducing the consequences of MIP.(Partnership, Roll Back Malaria 2012)

2.3.3.1 The new WHO guideline 2014 recommends:

- The first IPTp-SP dose should be administered as early as possible during the 2nd trimester of gestation
- Each SP dose should be given at least 1 month apart
- The last dose of IPTp-SP can be administered up to the time of delivery, without safety concerns.
- IPTp-SP should ideally be administered as Directly Observed Therapy (DOT) of three tablets sulfadoxine/pyrimethamine (each tablet containing 500 mg/25 mg SP) giving the total required dosage of 1500 mg/75 mg SP.
- SP can be given either on an empty stomach or with food.
- SP should not be administered to women receiving co-trimoxazole prophylaxis due to a higher risk of adverse events.
- WHO recommends the administration of folic acid at a dose of 0.4 mg daily; this dose may be safely used in conjunction with SP. Folic acid at a daily dose equal or above 5 mg should not be given together with SP as this counteracts its efficacy as an antimalarial.
- SP should be made available at antenatal care clinics, so that pregnant women have immediate access to IPTp-SP during routine care. SP should ideally be given as directly observed treatment (DOT), since this ensures that pregnant women take the full dose.

- If a woman presents to an antenatal care clinic with symptoms of malaria, these symptoms should be investigated before the administration of IPTp-SP. If the woman tests positive for malaria – by either microscopy or rapid diagnostic test (RDT) – she should be treated following national case management guidelines. If she is negative, she should receive IPTp-SP

Conditions for use of Sulphadoxine-Pyrimethamine include; all pregnant women shall undergo screening before the commencement of IPT in order to exclude those who are either G-6PD deficient or allergic to sulphonamides. Pregnant women who cannot take the Sulphadoxine-Pyrimethamine in IPT shall be encouraged to sleep under Insecticide Treated Nets and to report early when they have symptoms suggestive of malaria. (Ministry of Health, 2009)

2.4 Effectiveness of SP against Malaria in Pregnancy

According to Kathrine et al, SP retained some efficacy in clearing parasites in pregnant women, and remained a viable option for IPTp in Zambia. (Sikambale, Halwindi, & Baboo, 2013)

At a recent WHO evidence review, a meta-analysis of seven trials evaluating IPTp-SP was undertaken. It showed that three or more doses of IPTp-SP were associated with higher mean birth weight and fewer low birth weight (LBW) births than two doses of IPTp-SP. The estimated relative risk reduction for Low Birth Weight was 20% (95% CI 6-31). This effect was consistent across a wide range of SP resistance levels. The 3+ dose group also was found to have less placental malaria. There were no differences in serious adverse events between the two groups.(WHO, 2012)

Using a retrospective birth cohort from 32 national cross-sectional datasets in 25 African countries from 2000-2010, Eisele et al assessed the effectiveness of malaria prevention in

pregnancy (IPTp or ITNs) under routine program conditions. Neonates born to women in their first or second pregnancies who self-reported taking at least two doses of IPTp-SP and/or had an ITN in their household continuously at least six months prior to giving birth was significantly associated with decreased risk of neonatal mortality (18%; $p < 0.006$) and reduced odds of low birth weight (21%; $p < 0.001$) when compared with new born babies of mothers with no protection. The protective effect on both outcomes (neonatal mortality and low birth weight) held true for women of all parity. In a randomized, placebo controlled trial of IPTp-SP in 1030 pregnant Mozambican women, Menéndez et al found use of IPTp was associated with a 61.3% reduction in neonatal mortality. Among the 997 live born babies (500 born to women in the placebo group and 497 to women in the IPTp-SP group) there were 25 neonatal deaths; 18 were born to women in the placebo group and 7 to women who received IPTp. Eighty percent of neonatal deaths occurred in the first week of life. In the context this same trial, Sicuri et al found IPTp-SP was highly cost effective for both prevention of maternal malaria and reduction of neonatal mortality, with an incremental cost-effectiveness ratio of US\$1.02 per disability-adjusted life year averted. (Partnership, Roll Back Malaria 2012)

2.4.1 Adequate IPTp-SP

Despite increasing or a relatively high ANC coverage or attendance, there has not been a commensurate increase in adequate IPTp uptake. A recent recommendation in 2014 states that pregnant women can have up to 5 doses of IPTp-SP starting very early in the second trimester. (WHO, 2014) A cross-sectional study by Antwi (2009) in Bosomtwi, Ghana, revealed that the coverage for IPTp was 95%, 77% and 44% for IPT1, 2 and 3 respectively. (ANTWI, 2010). A study in Gushegu District Hospital in 2012 revealed 44% for IPTp3 uptake. (van Spronsen et al., 2012)

Another study in 2013 at this time looking at the whole Gushegu District, looked at adequate IPTp of greater or equal to 2 doses of IPTp-SP and found inadequacy of 8.5%. (van Spronsen et al., 2012) A study found that the uptake of IPTp among pregnant women in Sesheke for the third DOS (fansidar) was very low (30%).(Sikambale et al., 2013)

In some African countries among the approximately 840 million persons at risk of malaria in endemic countries in sub-Saharan Africa, an estimated 35 million pregnant women could benefit from IPTp each year. However, during the last few years, WHO has observed a declining effort to scale-up IPTp in a number of African countries. In high-burden countries, IPTp noticeably lags behind other malaria control measures. From the afore-mentioned it is important therefore to examine the factors that are influencing IPTp uptake.

2.5 Factors influencing IPTp-SP uptake

As has been depicted in the introduction, several factors influence the uptake of adequate IPTp-SP (IPTp3+) uptake. The factors that would affect adequate IPTp uptake that would be assessed in this study are described below.

2.5.1 Socio-demographic factors of pregnant women

Parity was the only socio-demographic factor found to be associated with the number of SP doses the pregnant women received ($p=0.01$ after adjusting for other socio-demographic factors). (ANTWI, 2010)

A study in Tanzania in 2012 showed that single women had a higher adequate uptake of IPTp (52%) compared to married. Increasing level of education was associated with more adequate uptake of IPTp.

Another study in Kenya revealed those who received adequate IPTp using adequacy of IPTp2+ to be highest between the 25 to 29years group. (District, Ngetich-mutulei, Kadenyi, Baliddawa, & Odhiambo, 2013)

Educational level of mothers was found to be a major contributor to IPTp uptake. (PATH, 2014a)

Unemployment was found to be significantly associated with inadequate IPTp-SP uptake.

2.5.2 Attitude towards ANC

Antenatal attendance provides contact for the pregnant woman and the skilled worker. During this period risks are identified and managed appropriately. There has been a shift from the high risk approach to the focused ANC. The focused ANC provides evidence-based interventions for all pregnant women. The WHO prescribes at least four visits (Bouyou-Akotet et al., 2013)

The median gestational age at first ANC visit was found to be 16 weeks (Range= 4-36 weeks) in Bosomtwi 2009. More than 80% of respondents made four or more ANC visits. This study demonstrated that 97.1% of pregnant women attend ANC in the Bosomtwe district. Interestingly, their gestation at first ANC visit was not found to statistically affect the number of SP doses received ($p>0.05$). (Dr. ANTWI Gifty Dufie, Department of Community Health, School of Medical Sciences, K.N.U.S.T., Kumasi, 2010)

About 85.4% were early ANC attendees in Gushegu District of Ghana in 2013 and was realised that late ANC visit was associated with low IPTp-SP uptake 89.6% (189) of the respondents had registered for ANC, of which 64.5% (136/211) and 9.9% (21/211) had registered in the 2nd trimester and 1st trimester, respectively. (van Spronsen et al., 2012)

In Ghana, the increasing trend of ANC attendance could be due to the fact that though most mothers have access to ANC services from GHS facilities and Teaching hospitals; many private institutions such as maternity homes have been established over the years in many communities in the rural and peri-urban areas, thereby increasing accessibility to ANC services

These show that there is appreciably high ANC attendance as well as early attendance of ANC and there is need to find out why despite the high attendance, there is low uptake of IPTp

2.5.3 Knowledge of mothers on malaria in pregnancy.

It is expected that the higher the level of knowledge of mothers on malaria especially about its consequences, the higher should be the uptake of IPTp-SP. A study in Lagos State, Nigeria showed that 79% perceived malaria as a serious illness but about 68% did not know what malaria really was regarding what were the causes. (Ayubu & Kidima, 2017)

The proportions of women with low, medium and high knowledge were 22.4, 50.3 and 27.3% respectively. The lowest knowledge scores related to the impact of maternal malaria on the health of the foetus. (Chituku, 2013)

2.5.4 Level of knowledge of pregnant women in IPTp

Knowledge about IPTp by the women was found to be associated significantly with returning for more doses of SP.(Antwi, 2010) 52.2% respondents have heard about IPTp but on 26% were able to define it. (Ayubu & Kidima, 2017)

Generally the lower the level of knowledge on what IPTp is the lower the expected uptake.

These may access ANC but still have low IPTp uptake.

2.5.5 Staff attitude

Perceived staff attitude by pregnant women should contribute to the uptake of IPTp. Friendly and welcoming attitude exhibited would encourage pregnant women to return for further ANC visits

and as a result subsequent doses of IPTp-SP. A similar study in the Ejisu-Juabeng district, among nursing mothers revealed that the warm attitude of the midwives encouraged them to return for repeat ANC visits. The clinical staff were said to be patient and tolerant with them (Smith et al, 2010).

Other factors have been identified in several studies such DOT, availability of SP and drinking water but these are not being assessed in this study.

CHAPTER THREE

3 METHODOLOGY

3.1 Introduction

This chapter describes the study design including the materials and the procedures employed in the study. It also describes the sampling methodology and techniques, sample size calculation as well as methods for data analysis.

3.2 Study area and population

3.2.1 Demographic characteristics

The District is located within the Forest-Savannah Transitional Ecological Zone of Ghana; and is generally covered with the moist Semi-Deciduous Forest. The vegetative cover is made up of timber resources such as Odum, Mahogany, Asanfins, Papao, Kyere, Oprono, Wawa, Ofram Teak, among others. Medicinal plants also exist in the forest e.g. Nim, Mahogany, Teak, etc.(Ghana Statistical Service, 2014).

The district has four sub-districts namely Nkonya, Kwamekrom/Abotoase, Bowiri and Worawora. For the purposes of health programs the district is zoned into six that are Nkonya, Kwamekrom, Abotoase, Bowiri, Overbank, and Worawora.

The district has three main ethnic groups namely Guan, Akan and Ewe. The Guan constitute the predominant ethnic group, Worawora is the mainly dominated Akan community. The Ewes are found mostly in communities along the Volta Lake. Other ethnic groups include the Hausa, Basare, Kotokoli and Kabrewho. The major dialects spoken are Nkonya, Twi, Ewe, Tiwuli and Akporsor. (Ghana statistical Service, 2014)

The main means of transport is by road. The district has its main trunk road from Nkonya Asakyiri to Apesokubi, Worawora to Okajakrom and Abotoase to Okajakrom all being second class roads. All other roads in the district are third class at various stages of deterioration with some being un-motorable. The second means of transport is by water with the use of canoes and boats. (Ghana Statistical Service, 2014)

The population 11 years and older, 34,931 are literate. Six out of ten people (62.4%) indicated they could read and write both English and Ghanaian languages. Of the population aged 3 years and older (24,741) in the district, 21.2 percent has never attended school, 41.1 percent are currently attending and 37.8 percent have attended in the past. (Ghana Statistical Service, 2014)

About 77.1 percent of the population above 15 years are economically active with 60.4 percent engaged in skilled agriculture, forestry workers, craft and related trades work (14.9%) service and sales workers (13.5%) and 3.8 percent are engaged professionals.(Ghana Statistical Service, 2014)

The district is not far different from other districts in Ghana with three main religious groups. The main religious groups are Christianity, Islam and Traditional religions. The district is dominated by traditionalists and Christians with Muslims as the minority. (Ghana Statistical Service, 2014)

The study population will comprise post-partum women who attend postnatal and child welfare clinics at the Biakoye district hospital, all the health centres and 10 randomly selected CHPS in the district.

Target Population for Reproductive and Child Health Services

Total population	78,961
Less than 1yr	2,427
Less than 5yrs	11,590
Women in fertility age	18,519

(Ghana Statistical Service, 2013)

There is one (1) Hospital, four (4) Health Centres, nine (11) CHPS Zones and one (1) Clinic.

Health Facilities in the Biakoye District

Nkonya Sub-district	1) Nkonya Wurupong Health centre
	2) Nkonya Ahenkro CHPS
	3) Tayi CHPS (Demarcated)
	4) Asakyiri CHPS (Demarcated)
Abotoase/Kwamikrom Sub-district	5) Abotoase Health Center
	6) Kwamikrom Health Center
	7) Bumbula CHPS (Demarcated)
	8) Tapa Amanfrom CHPS
	9) Tapa Alavanyo CHPS (Demarcated)
	10) Bowiri Odumase CHPS
	11) Odometor CHPS
Worawora/Apesokubi sub-district	12) Worawora Hospital
	13) Many CHPS
	14) Apesokubi CHPS
Bowiri Zone	15) Bowiri Amanfrom CHPS zone
	16) Bowiri Amanfrom CHPS zone
	17) Bowiri Takrabe CHPS

Source: Biakoye District Health Directorate

3.3 Study Design

The study is a cross-sectional quantitative study to ascertain the contributing factors to low IPTp³⁺ uptake in the Biakoye district of Volta region of Ghana. The study also investigated the attitude of pregnant women towards Antenatal care, their knowledge on measures to prevent

malaria in pregnancy with special reference to intermittent prevention of malaria in pregnancy (IPTp) with sulfadoxine- pyrimethamine (SP).

3.4 Sample size

Raosoft software was used to determine the sample size at 384 based on the population of Women in Fertility Age (WiFA) at 18,519. A confidence interval of 95% and acceptable margin of error of 5% was used.

To select survey Sample size below assumptions are taken

Steps to calculate sample Size

1. Confidence level corresponds to a Z-score for 95% Z -Score = 1.96
2. Plug in Z-score, Standard of Deviation, and confidence interval into below equation:

Simple Sample Size = $(Z\text{-score})^2 * StdDev * (1 - StdDev) / (\text{margin of error})^2$

Population Size is 18,509

Margin of error (Confidence Interval) is +/- 5%

Confidence level is 95%

Standard of Deviation is taken 0.5

Therefore simple sample size was = $((1.96)^2 * .5(.5)) / (.05)^2 = 384$

3.5 Sampling technique

Stratified sampling technique was employed to capture all the various sub-districts. The district was divided into four sub-districts, each of which has at least one health centre. Mothers who

were one year postpartum or less were selected within the community and at the Child welfare Clinics (CWC) except when they opt out in order to reduce recall bias.

3.6 Inclusion and Exclusion criteria

Postnatal mothers who delivered within twelve (12) months and attended ANC in the Biakoye district were selected for the study.

On the other hand, postpartum women who did not attend ANC in the District and those who were more than twelve (12) months post-partum at the time of the study were excluded.

3.7 Data collection techniques

The tool for data collection was a structured questionnaire which was administered through a face-to-face interview.

Field assistants were trained on interviewing and administering structured questionnaires and then deployed for the field work over the three months' period. The head of BMC in all the selected health facilities were trained to supervise the data collection process and provided with support as was required. The field workers were not from the health facility to prevent bias and they interpreted the questions in the local dialect of respondents as was required.

3.8 Analysis of data

MS excel and Stata14 were used to enter, analyse and present the information. The information is presented in graphs and tables. Chi-square/ Fischer Exact tests and the logistic regression analysis were used to test the association between categorical variables. The likelihood ratio (LR) test was used to determine the effect of some of the variables on the coverage of IPTp in the logistic regression model or analysis.

3.9 Ethical considerations

Ethical clearance was sought from the Ensign College Ethical Review Board and permission sought from the District health directorate for the conduct of the study. The interview was conducted in a private environment and respondents were assured of the confidentiality of their responses. Names of respondents were not indicated on the questionnaires.

3.10 Pre-test methods

All data collection techniques and tools were pre-tested over one week period in a neutral site within one of the communities in the Kejebi districts with similar social and demographic characteristics as the study community.

Changes were made appropriately on the data collection tool to suit the purpose of the study. For example: an additional option was added to the marital status to accommodate co-habiting couples. There was the need to show a sample of IPTp sachet to respondents to prevent confusion with other routine ANC drugs.

3.11 Limitations of study

1. The study assessed only women who attended postnatal and child welfare clinics

3.12 Assumptions

The following assumptions were made:

1. That all people sampled would participate and would give correct answers.
2. That all the respondents can reasonably recollect what transpired during the antenatal period.

CHAPTER FOUR

4 RESULTS

This chapter is a summary of the findings obtained from the survey under the following topics: socio-demographic characteristics of respondents, attitude of respondents towards antenatal care, knowledge of respondents on malaria in pregnancy, knowledge of respondent on IPTp for malaria prevention, attitude of respondents towards IPTp, effect on socio-demographic characteristics on ANC care seeking, effect of socio-demographic characteristics on IPTp use.

Table 4.1.a: Socio-Demographic Characteristics of Respondents

Characteristics	Frequency	Percent
	N=390	-100%
Age		
18-25	180	46.13
26-34	141	36.15
35 and above	69	17.69
Marital status		
Single	57	14.62
Married	240	61.54
Co-habiting	88	22.56
Divorced Separated	5	1.28
Level of education		
Primary	88	22.56
JHS	172	44.1
SHS	35	8.97
Tertiary	17	4.36
None	78	20
Occupation		
Civil servant	18	4.62
Farming/Fishing	108	27.69
Trader/Trademan	133	34.1
Unemployed	74	18.97
Other	57	14.62

Source: Field work, 2017

Table 4.1.b: Socio-Demographic Characteristics of Respondents

Characteristics	Frequency	Percent
Religious Affiliation		
Christian	357	91.54
Muslim	27	6.27
Other	6	1.54
Facility Type		
Health Center	281	72.05
Hospital	109	27.95

Source: Field work, 2017

Table 4.1, shows the socio-demographic characteristics of respondents. It can be deduced that majority were in the 18-25 years age group, followed by 26-34 years then above 35 years.

A significant number of respondents are married 240 (61.54%), 88(22.56%) co-habiting and 62(15.90%) unmarried. Also 52(13.33%) have had at least SHS education, 260(66.66%) at least JHS and 78(20%) had no formal education.

Furthermore, 298(76.41%) were working in the informal sector, 18(4.62%) in the formal sector and 57(14.62%) were unemployed. Then 281(72.05%) attended ANC at a Health centre while 109 attended at the hospital.

Table 4.2.a: Attitude of respondents towards Antenatal Care

Characteristics	Frequency (N)	Percentage (%)
ANC attendance		
No	5	1.28
Yes	385	98.72
Total	390	100
If no, why didn't you		
I didn't know I had to	1	20
I had no money	1	20
Others	2	40
clinic too far	1	20
Total	5	100
How many times did you attend ANC		
One	13	3.37
two	15	3.89
Three	45	11.66
4 and above	313	81.09
Total	386	100
Were you given ANC card		
No	56	14.55
Yes	329	85.45
Total	385	100
Gestational term at registration		
First trim	247	64.16
I don't know	6	1.56
Second trim	116	30.13
Third trim	1622	4.16
Total	385	100
Were ask to come again		
No	24	6.23
Yes	361	93.77
Total	385	100
Where you educated on importance of ANC		
No	99	28.29
Yes	251	71.71
Total	350	100

Source: Field work, 2017

Table 4.2.b: Attitude of respondents towards Antenatal Care

Perception of staff attitude		
Not satisfied	20	5.19
Satisfied	293	76.1
Very satisfied	72	18.7
Total	385	100

Source: Field work, 2017

Table 4.2 illustrates the attitude of respondents towards Antenatal care seeking. It shows that a majority 385(98.72%) of them attended ANC at least once. Out of that, 18.92% (73) attended a minimum of three times and 81.45% (313) attended more than three times.

The time of commencement of ANC shows that majority 247(64.16%) started in the first trimester, 116(30.13%) in the second trimester, 162(4.16%) in third trimester. On staff attitude, majority 369(81.20%) expressed satisfaction while 72(18.7%) said they were not satisfied.

Table 4.3.a: Knowledge of respondents on malaria in pregnancy

Characteristics	Frequency (N)	Percentage (%)
How is malaria transmitted		
Don't know	41	10.51
Mosquito bite	330	84.62
Others	13	3.33
Sexually transmitted	2	0.51
Spiritual attack	4	1.03
Total	390	100
What are the effects of malaria in pregnancy		
Cause anaemia	141	36.53
Don't know	71	18.39
Lead to death	110	28.5
Others	64	16.58
Total	386	100

Source: Field work, 2017

Table 4.3.b: Knowledge of respondents on malaria in pregnancy

Characteristics	Frequency (N)	Percentage (%)
How do you prevent malaria		
Don't Know	25	6.48
Others	25	6.48
Sleep under ITN	309	80.05
Use mosquito repellent	13	3.37
Wear protective clothing	14	3.63
Total	386	100
Were you given the antimalarial medication		
Don't know	6	1.56
No	25	6.49
Yes	354	91.95
Total	385	100

Source: Field work, 2017

Table 4.3 illustrates the knowledge of respondents on malaria in pregnancy. On how malaria is transmitted, 84.62% (330) identified mosquito bite as the cause while 4.87% (19) gave wrong answers and 10.51% (41) said they didn't know.

They were able to identify anaemia [36.53% 141], death [28.5% (110)] and other related conditions as the consequence of malaria in pregnancy. Also, respondents gave sleeping under insecticide treated nets [80.05% (309)], wearing protective clothing 14(3.37%), use of mosquito repellents [3.63% (13)] and other related measures as the methods to prevent malaria; 6.48% (25) however said they had no idea.

Table 4.4: Knowledge of respondents on IPTp for malaria prevention

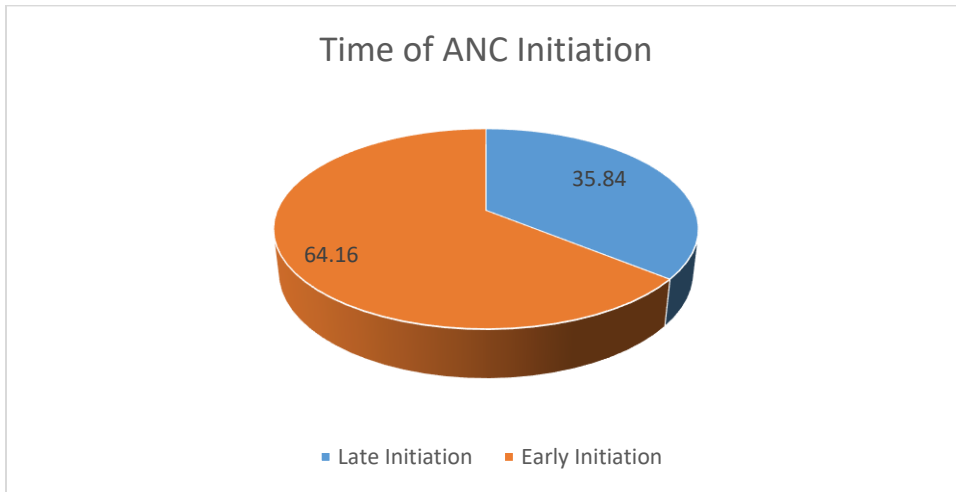
Characteristics	Frequency (N)	Percentage (%)
Were given IPT during pregnancy		
Don't know	6	1.56
No	25	6.49
Yes	354	91.95
Total	385	100
If no, why not		
I don't have malaria	7	28.00
I have an allergic reaction to it	1	4.00
I refused it	3	12.00
Not available	1	4.00
Others	13	52.00
Total	25	100
What is the importance of IPT		
I don't know	79	21.53
Others	6	1.63
To make my baby big	4	1.09
To prevent malaria	196	53.41
To prevent me from dying	15	4.09
To treat malaria	67	18.26
Total	367	100
How many doses were you given		
3 time and above	196	53.99
Ones	74	20.39
Twice	93	25.62
Total	363	100
If less the 3, why		
Facility too far	11	8.03
Had side effect	11	8.03
I don't like it	12	8.76
It's not important	42	30.66
Lack of money to visit facility	22	16.06
No medication at facility	39	28.47
Total	137	100

Source; Field work, 2017

Table 4.4 shows how knowledgeable respondents were on uptake of IPTp to prevent malaria in pregnancy. Majority 354(91.95%) of respondents took IPTp during pregnancy, but 25(6.49%) said they did not while 6(1.56%) had no idea. Out of those who did not take IPTp during their pregnancy 24(96%) refused it for one reason or another and 1(4.00%) indicated the facility lacked the drug. On doses of IPTp taken, 196(53.99%) had three and above while 169(46.01%) took below three doses.

To assess attitude of pregnant mothers towards Antenatal care

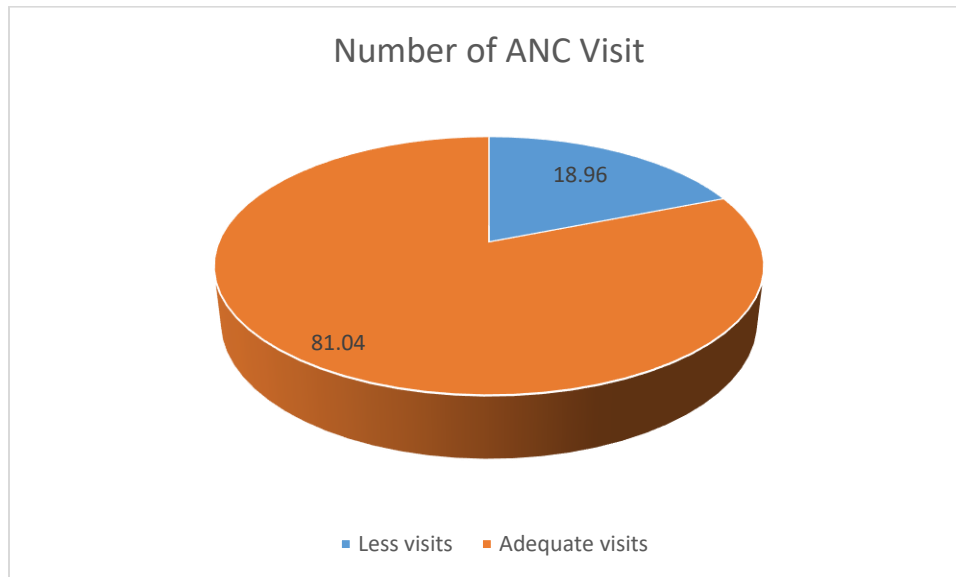
Figure 4.1: Time of Antenatal Initiation (1st ANC Visit)



Source: Field work, 2017

Fig. 1 shows the age of gestation at which respondents had their first antenatal care visit. It can be deduced that majority (64.16%) started early enough as compared to 35.84% who started later in pregnancy.

Figure 4.2: Number of Antenatal Visits



Source: Field work, 2017

Fig. 2 illustrates antenatal attendance for at least four (4) times. It can be seen that majority of respondents (81.04%) attained adequate no of visits while 18.96% had less.

Factors affecting ANC attendance

Table 4.5: Age on Antenatal Attendance

Parameter	Attaining adequate ANC		Total
	Less visits	Adequate	
18-25	37(20.90)	140(79.10)	177(100.00)
26-34	20(14.29)	120(85.71)	140(100.00)
35 and above	16(23.96)	52(85.71)	68(100.00)
Total	73(18.96)	312(81.04)	385(100.00)

Pearson chi-square -3.3500

Pr - 0.187

Source: Field work, 2017

Table 4.5 shows the relations between age and ANC attendance. With a Pearson's correlation coefficient of 0.187, it can be deduced that age had no significant impact on ANC attendance.

Table 4.6: Level of Education on Antenatal Attendance

Parameter	Attaining adequate ANC		Total
	Less visits	Adequate	
Lower level	42(16.34)	215(85.66)	257(100.00)
Higher level	3(5.77)	49(94.23)	52(100.00)
No formal education	28(36.96)	48(63.16)	76(100.00)
Total	73(18.96)	312(81.04)	385(100.00)

Fisher's exact = 0.000

Source: Field work, 2017

Table 4.6 Shows the Relationship between Level of Education and Antenatal Attendance. With a fisher's exact value of 0.000, it is clear that the level of respondent's education has a significant impact on their ANC attendance.

Table 4.7: Marital Status on Antenatal Attendance

Parameter	Attaining adequate ANC		Total
	Less visits	Adequate	
Married	46(19.41)	191(80.59)	237(100.00)
Co-habiting	17(19.54)	70(80.46)	87(100.00)
Single/separated	10(18.39)	51(83.61)	61(100.00)
Total	73(18.96)	312(81.04)	385(100.00)

Pearson chi-square -3.3117

Pr - 0.856

Source: Field work, 2017

Table 4.7 displays the relationship between respondents' marital status and adequacy of ANC attendance. With a Pearson's correlation coefficient of 0.856, it can be deduced that one's marital status does not have a significant relationship with their ANC attendance.

Table 4.8: Type of Facility and Antenatal Care Attendance

Parameter	Attaining adequate ANC		Total
	Less visits	Adequate	
Health centre	63(22.30)	216(77.70)	278(100.00)
Hospital	11(10.28)	96(69.72)	107(100.00)
Total	73(18.96)	312(81.04)	385(100.00)

Pearson chi-square -3.3500

Pr - 0.187

Source: Field work, 2017

Table 4.8 demonstrates the association between ANC attendance and type of health facility. It can be seen using the Pearson's correlation coefficient (Pr=0.007) that; type of facility significantly affects ANC attendance such that 96% of at the hospital attendees attained at least four visits, as compared to 77.70% of those who attended Health centre.

Table: 4.9: Time of Antenatal Commencement on Attendance

Parameter	Attaining adequate ANC		Total
	Less visits	Adequate	
Late initiation	48(34.78)	90(65.22)	138(100.00)
Early initiation	25(10.12)	222(89.88)	247(100.00)
Total	73(18.96)	312(81.04)	385(100.00)

Pearson chi-square (1) -35.0418

Pr - 0.000

Source: Field work, 2017

Table 4.9 expresses the relationship between time of first ANC and adequacy of attendance. With a Pearson's correlation coefficient of 0.000, it can be inferred that time/term of commencement of ANC affects the ultimate number of attendance.

Table 4.10: Staff Attitude and Antenatal Attendance

Parameter	Attaining adequate ANC		Total
	Less visits	Adequate	
Not satisfied	3(15.00)	17(85.00)	20(100.00)
Satisfied	59(20.14)	234(79.86)	293(100.00)
Very satisfied	11(15.28)	61(64.04)	72(100.00)
Total	73(18.96)	312(81.04)	385(100.00)

Pearson chi-square (2) - 1.1034

Pr - 0.576

Source: Field work, 2017

Table 4.10 illustrates the association between staff attitude and adequate of ANC attendance.

Pearson's correlation coefficient (Pr=0.576) shows that there is no substantial link between staff attitude and ANC attendance as 85% of respondents who were not satisfied with staff attitude still attained fourth visit.

Association between Mothers' Socio-demographic characteristics and knowledge on Malaria in pregnancy. Using chi square and Fisher's exact

Factors Affecting Knowledge on Malaria in Pregnancy

Table 4.11: Mothers Education and Knowledge on Malaria in Pregnancy

Parameter	Knowledge on malaria		Total
	Low	High	
Lower level	60(16.34)	200(76.92)	260(100.00)
Higher level	5(9.62)	47(90.38)	52(100.00)
No formal education	30(38.46)	48(61.54)	78(100.00)
Total	95(18.96)	295(81.04)	390(100.00)

Pearson chi-square (2) - 14.7859

Pr - 0.001

Source: Field work, 2017

Table 4.11 shows the association between level of education and knowledge on malaria in pregnancy entail with a Pearson's correlation coefficient of 0.00.1 is can be extrapolated that there is a strong link between the two variables. This is increasing trend of knowledge no formal education (61.54%), lower education (76.92%) and higher education (90.38%).

Table 4.12: Marital Status and Knowledge on Malaria in Pregnancy

Parameter	Knowledge on malaria		Total
	Low	High	
Married	65(27.08)	175(72.92)	240(100.00)
Co-habiting	17(19.97)	71(80.68)	88(100.00)
Single/separated	13(20.97)	49(79.03)	62(100.00)
Total	95(18.96)	295(81.04)	390(100.00)

Pearson chi-square (2) – 2.5673

Pr - 0.277

Source: Field work, 2017

The table above shows the relationship between respondents' marital status and their knowledge on malaria in pregnancy. It can be deduced that marital status had no substantial effect on the knowledge of respondents on malaria in pregnancy as per the Pearson's correlation coefficient value (Pr=0.277).

Table 4.13: Type of Health Facility Attended and Knowledge on Malaria in Pregnancy

Parameter	Knowledge on malaria		Total
	Low	High	
Health centre	66(23.49)	175(76.51)	281(100.00)
Hospital	29(26.61)	80(73.39)	109(100.00)
Total	95(18.96)	295(81.04)	390(100.00)

Pearson chi-square (1) – 0.4144

Pr - 0.520

Source: Field work, 2017

Table 4.13 illustrates the relationship between the type of health facility attended and knowledge of respondents on malaria in pregnancy. There is no apparent relationship between the type of facility attended and understanding of malaria in pregnancy. (Pr=0.520)

Table 4.14: Timing of 1st ANC visit and knowledge on malaria in pregnancy

Parameter	Knowledge on malaria		Total
	Low	High	
Late initiation	36(26.09)	102(73.91)	138(100.00)
Early initiation	58(23.48)	186(76.52)	247(100.00)
Total	94(24.42)	189(76.52)	390(100.00)

Pearson chi-square (2) – 0.3256

Pr - 0.568

Source: Field work, 2017

Table 4.14 demonstrates the link between respondents' knowledge on pregnancy and the time they commenced ANC attendance. With a Pearson's correlation coefficient of 0.569, one can infer that there is not enough correlation between them to draw any meaningful conclusion.

To ascertain the knowledge of mothers on IPTp for malaria prevention in pregnancy

Table 4.15: Age of Repondents on Their Knowledge IPTp

Parameter	Knowledge on IPTp		Total
	Low	High	
Below 26	82(48.24)	88(51.76)	170(100.00)
Above 26	89(45.18)	108(54.82)	197(100.00)
Total	171(46.59)	196(53.41)	367(100.00)

Pearson chi-square (1) – 0.3428

Pr - 0.558

Source: Field work, 2017

The table above shows the relationship between respondents age and their level of knowledge on IPTp. With a a Pearson’s correlation coefficient of 0.558, it can be deduced that there is no significant link between these variables.

Table 4.16: Level of Education and Knowledge on IPTp

Parameter	Knowledge on IPTp		Total
	Low	High	
Primary	32(45.71)	49(60.49)	81(100.00)
JHS	90(54.22)	76(45.76)	166(100.00)
SHS	13(38.24)	76(45.78)	166(100.00)
Tertiary	4(25.00)	12(75.00)	16(100.00)
Total	171(46.59)	196(53.41)	367(100.00)

Fisher’s exact - 0.051

Source: Field work, 2017

The table above shows the relationship between the educational level of respondents and their level of knowledge on IPTp. One can deduce that there is not much correlation between the variables. The Pearson’s correlation coefficient of buttresses that assertion (Pr=0.051).

Table 4.17: Marital Status and Knowledge of IPTp

Parameter	Knowledge on IPTp		Total
	Low	High	
Married	111(50.23)	110(49.77)	221(100.00)
Co-habiting	34(40.00)	51(60.00)	85(100.00)
Single/separated	26(42.62)	35(57.38)	61(100.00)
Total	171(46.59)	196(53.41)	367(100.00)

Pearson chi-square (2) – 3.0435

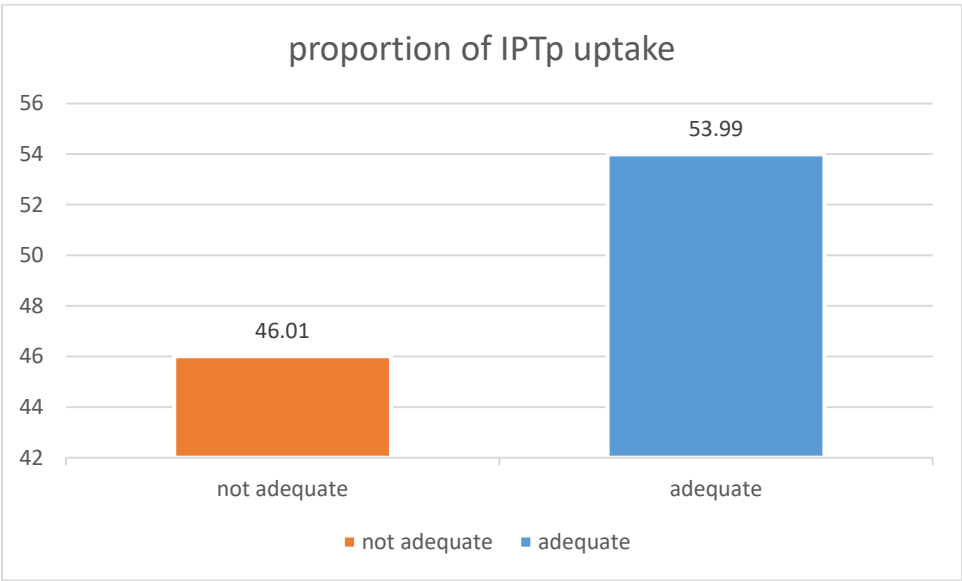
Pr - 0.218

Source: Field work, 2017

Table 4.17 shows the relationship between marital status of respondents and their level of knowledge on IPTp. With a Pearson’s correlation coefficient of 0.218, one can see that there is no direct relationship between the two variables.

To determine the factors influencing IPTp3+ uptake

Figure: 4.3: Proportion of Respondents with Adequate IPTp Uptake



Source: Field work, 2017

Fig. 4.3 illustrates the proportion of respondents with at least three (3) uptake of IPTp. It can be deduced that majority (53.99%) had adequate of IPTp as compared to 45.01 who had less.

Table 4.18: Age of Respondents on IPTp Uptake

Parameter	Uptake of IPTp		Total
	Not adequate	Adequate	
Below 26	86(51.81)	80(48.4819)	166(100.00)
Above 26	81(41.12)	116(58.88)	197(100.00)
Total	167(46.01)	196(53.99)	363(100.00)

Pearson chi-square (1) – 4.1448

Pr - 0.042

Source; Field work, 2017

Table 4.18 shows the relationship between ages of respondents and their Uptake of IPTp. The table reveals that respondents above 26 years were more likely to take adequate IPTp as compared to those below 26 years. The Pearson's correlation coefficient (0.042) however shows that the link between the two variables is not so substantial.

Table 4.19: Educational Level on Uptake of IPTp

Parameter	Uptake of IPTp		Total
	Not adequate	Adequate	
Lower level education	101(41.74)	141(58.26)	242(100.00)
Higher level education	17(34.00)	33(66.00)	50(100.00)
No formal education	49(69.01)	22(30.99)	71(100.00)
Total	167(46.01)	196(53.99)	363(100.00)

Pearson chi-square (2) – 19.8088

Pr - 0.000

Source: Field work, 2017

The table above illustrates the relationship of respondents' level of education on their IPTp uptake. It can be deduced that higher level of education has a positive effect on IPTp uptake, such that the percentage of respondents with adequate IPTp uptake increases with level of education. With a Pearson's correlation coefficient of 0.000 the correlation is very significant

Table 4.20: Marital Status on Uptake of IPTp

Parameter	Uptake of IPTp		Total
	Not adequate	Adequate	
Married	86(51.81)	80(48.4819)	166(100.00)
Co-habiting	45(53.57)	39(46.43)	84(100.00)
Single/divorce	33(56.90)	25(43.10)	58(100.00)
Total	167(46.01)	196(53.99)	363(100.00)

Pearson chi-square (1) – 7.6304

Pr - 0.022

Source: Field work, 2017

Table 4.20 shows the relationship between respondents marital status and their uptake of IPTp. The table demonstrates that there is no significant relationship between marital status and uptake of IPTp (Pr=0.022).

Table 4.21: Type of Health Facility on Uptake of IPTp

Parameter	Uptake of IPTp		Total
	Not adequate	Adequate	
Health centre	134(51.15)	128(48.85)	262(100.00)
Hospital	33(32.67)	68(67.33)	101(100.00)
Total	167(46.01)	196(53.99)	363(100.00)

Pearson chi-square (1) – 10.0132

Pr - 0.002

Source: Field work, 2017

Table 4.21 shows the relations between type of health facility respondents attended for ANC and their uptake of IPTp. The table demonstrates that the more (67.33%) respondents who visited the hospital took adequate IPTp as compared to those who visited Health centres (48.85%). The Pearson's correlation coefficient (0.002) confirms the strong link between the two variables.

Table 4.22: Distance to Health Facility on Uptake of IPTp

Parameter	Uptake of IPTp		Total
	Not adequate	Adequate	
Very close	16(51.15)	15(48.39)	31(100.00)
Close	66(39.52)	101(60.48)	167(100.00)
Far	67(51.15)	64(48.85)	131(100.00)
Very far	18(52.94)	16(47.47.06)	34(100.00)
Total	167(46.01)	196(53.99)	363(100.00)

Pearson chi-square (3) – 5.2708

Pr - 0.153

Source: Field work, 2017

The table above shows the relationship between distances respondents had to travel to health facility on uptake of IPTp. With a The Pearson's correlation coefficient of 0.153 one can clearly see that there is no relationship between the two variables.

Table 4.23: ANC Attendance on Uptake of IPTp

Parameter	Uptake of IPTp		Total
	Not adequate	Adequate	
Less visits	45(66.18)	23(33.82)	68(100.00)
Adequate visits	121(41.30)	172(58.70)	293(100.00)
Total	167(46.01)	196(53.99)	367(100.00)

Pearson chi-square (1) – 13.7539

Pr - 0.000

Source: Field work, 2017

The table above shows the relationship between ANC attendance and uptake of IPTp. It can be seen that there is a significant link between the two variables (Pr=0.000). Clearly respondents with adequate ANC attendance are more likely to attain adequate IPTp.

Table 4.24: Time of 1st ANC on Uptake IPTp

Parameter	Uptake of IPTp		Total
	Not adequate	Adequate	
Late ANC initiation	73(57.03)	55(42.97)	128(100.00)
Early ANC initiation	93(39.91)	140(60.09)	233(100.00)
Total	166(45.98)	195(54.02)	361(100.00)

Pearson chi-square (1) – 9.7452

Pr - 0.002

Source: Field work, 2017

Table 4.24 illustrates the relationship between how early respondents started ANC attendance and uptake of IPTp. It can be deduced that time of ANC initiation have a significant effect on uptake of IPTp. The earlier they start ANC the better (60.09%) their score of IPTp uptake. This is buttressed by the Pearson’s correlation coefficient value (Pr=0.002).

CHAPTER FIVE

5 DISCUSSION

5.1.1 Introduction:

This chapter seeks to discuss the factors contributing to the low IPTp uptake as has been identified in the study.

This will be discussed as has been outlined in the specific objectives and as has been outlined in the results above under the following headings: 1.To ascertain the factors influencing IPTp3+ uptake 2. Knowledge of mothers on malaria in pregnancy 3. Knowledge of mothers on IPTp for malaria in pregnancy and 4. Attitude of pregnant women towards antenatal care.

As had been identified prior to the study the level of uptake of IPTp3+ was low at about 54% as compared to 81.04% who had adequate ANC attendance. This is comparable to study by Antwi which had 44% and a national IPTp3+ of 63%.

The factors that were significant contributors to low IPTp3+ uptake were Age, level of education, religion, occupation, marital status, place of ANC attendance, how early ANC was started and adequacy. Those not found to be significant contributors to adequate IPTp uptake were distance to ANC, surprisingly knowledge on malaria and IPTp

5.1.2 Adequate IPTp

Adequate IPTp is uptake of 3 or more. As has been depicted in the study about 54% of respondents had adequate IPTp uptake compared to 44% by Antwi in 2009 in Bosomtwe. This compares to a current national adequate IPTp uptake of 63% .WHO recommends pregnant women taking now a minimum of five (5) doses of SP. With only 54% uptake of even 3 doses, we may deduce that 5 doses may be even lower. This compares to the districts value of 38%.

This shows that for more than seven (7) years the level of uptake of adequate IPTp uptake has not improved significantly despite several efforts. It is therefore important to analyse the factors that could be truly responsible for the low IPTp uptake that could change policy direction.

5.1.3 Attitude of pregnant women towards ANC

ANC attendance

As has been depicted in the study from table 4.3, there is a positive attitude towards ANC attendance. Almost 99% of respondents have attended at least one ANC. This is comparable to the finding of 97.1% in Bosomtwe in 2009. The National ANC attendance stands at 87% despite this high attendance the level of adequate uptake of SP is low. It also means that we can count on the attendance as positive gain in planning for measures to increase adequate IPTp uptake. For the very few who did not attend the reasons were no money, and clinic being too far (1.28%).

5.1.4 Adequacy of ANC attendance

81.09% attended 4 or more times. This is very similar to 80% in Bosomtwe done more than 7 years. This means that adequate ANC attendance has remained similar for over 7 years. It means that most probably the interventions being used to increase adequate ANC attendance might not be making good and enough impact. Adequate ANC attendance will definitely be a contributory factor to adequate IPTp uptake. About 94% of respondents were actually encouraged to come more than once this is a little lower than 99% that was found in Bosomtwe in 2009

Only 71.2% said they were given education on the importance of ANC attendance even though 94% were told to come again. So it can be depicted that the more the knowledge on the importance of ANC attendance, the more likely the adequacy of attendance is likely to improve.

5.1.5 Gestational term at registration:

About 64.2% of respondents registered in the first trimester. It is encouraged that pregnant women register early and in the first trimester. Early registration will expose them early to most of the interventions in pregnancy. The national early ANC registration is 46%.

5.1.6 Perception of staff attitude

About 76.1% of mothers said they were satisfied and 18.7% very satisfied. Definitely the perception of staff attitude by attendants will influence the number of times they are supposed to return.

5.1.7 Knowledge of mothers on malaria in Pregnancy:

On Malaria transmission, 84.62% of respondents adequately identified mosquito to be responsible for malaria transmission. About 10.51% did not know the transmission factor for malaria and this is important to the overall goal of preventing malaria in pregnancy especially with insecticide treated net (ITN) usage.

5.1.8 Knowledge on effects of malaria in pregnancy

About 65.03% had adequate knowledge of the effect of malaria in pregnancy worrying, about 18.4% did not know the effect of malaria in pregnancy. Adequate knowledge is important to pregnant women coming back for more doses of IPTp.

Prevention of malaria

About 80% knew that ITN usage prevents malaria. This stems from the fact that there is free ITN distribution and teaching on usage.

5.1.9 Knowledge of mothers on IPTp for malaria prevention

About 75.8% mothers interviewed gave adequate knowledge on the importance of IPTp in pregnancy. Of these 53.41% said it prevents malaria, 18.3% said it treats malaria. Worrying is the fact that 21.5% said they did not know the importance of IPTp. This is important representing close to a quarter which means there might be a need to intensify education on importance of IPTp.

5.1.10 Factors influencing IPTp uptake

Introduction

Adequacy of IPTp uptake is SP intake of 3 or more. As has been discussed above, adequate IPTp uptake was 54%. This session will be discussed as factors that promote adequate IPTp uptake and those that contribute to low IPTp uptake which is the main object of this research. The factors that were significant to influence adequate IPTp uptake looking at the Pearson Correlation coefficient were Age, level of education, Religion, occupation, marital status, facility type, adequacy of ANC attendance, when ANC is initiated. The factors that were not significant to adequacy of IPTp uptake were Distance to facility for ANC and knowledge of malaria in pregnancy. It was surprising to note that how far clients stayed was not really significant to the adequacy of IPTp uptake as well as the level of knowledge of malaria.

Socio-demographic factors

Unlike the findings obtained in Bosomtwi in 2009 which looked at parity as the only socio-demographic factor influencing uptake of IPTp other factors were found to be significant as outlined above. Age above 26 years were found to receive more adequate doses of SP(58.9%)

compared to those below 26years(48.2). advancing age is most likely associated with increasing parity and that is comparable to the findings in Bosomtwi.

Higher level of education was associated with a higher adequacy of SP uptake. This means more attention should be targeted to those with lower level of education. Christianity seemed to increase one chances of receiving adequate SP 187(55.82%).

Civil servants were more likely to receive adequate SP doses most likely because civil servants are more likely to have higher level of education. Surprisingly traders were found to have adequate level of IPTp uptake 58.40% as compared to 55.56% among Civil servants. The married had more adequate uptake (almost 60%) compared to those single and cohabiting (43.10%)

Facility type.

Those attending the district hospital were found to have had more adequate uptake. The reasons could be availability of SP, staff attitude and level of education of clients

Adequacy of ANC attendance

Those who have more adequate ANC attendance definitely gives you a higher probability of having adequate IPTp uptake. If at least three of these visits were made after 16 weeks of gestation, then there was the increased opportunity of the pregnant women receiving at least two doses of SP. (ANTWI , 2010)

Time for initiation of ANC

Early registration gave more probability of receiving adequate IPTp uptake of 60.1 compared to 43% for late registration. Late first ANC attendance has been found to contribute to incomplete IPTp (van Eijk et al, 2004). About 64% of mothers in Biakoye District registered at ANC in the first trimester and not surprising that they are more likely to receive adequate doses of IPTp

CHAPTER SIX

6 CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

Knowledge of post-partum women on Antenatal care was shown to be very good. This is attributable to the high attendance in the Biakoye district, with a coverage of 98.72%. This shows the effectiveness of the campaign to encourage pregnant women to attend Antenatal clinic. Apart from that, the numbers making fourth visit is also appreciable 81.04%.

Also, the overall knowledge of post-partum women on malaria in pregnancy also came out very good. However this was not uniformly spread across the entire demographic spectrum.

The high score attained in knowledge of malaria in pregnancy translated into equally good scores for understanding of use and regimen of IPTp. However these did not result in increased IPTp uptake. The situation was even gloomier among people of the lower economic and educational class.

Furthermore, the type of health facility the women attended for Antenatal care was also shown to influence the adequacy of IPTp uptake; hospital attendance was released to contribute positively on the uptake of IPTp.

The distance to health facility and attitude of staff were demonstrated to be insignificant in relations to IPTp uptake. This is contrary to popular belief and direction of resources.

Therefore this study identified the following as the main contributing factors to low IPTp3+ uptake;

- Age; women below twenty six (26) years showed low (48.19%) uptake of IPTp3+
- Type of Facility; Attending lower (Health Centres) health care facilities was shown to adversely (48.85%) affect IPTp3+ uptake

- Education; Low educational level also came up as a negative (30%) influence on uptake of IPTp3+
- Occupation; Women in the formal sector were shown (55.56 %.) not to do so very well in adequate IPTp uptake.

6.2 Recommendations

It is recommended that measures put in place to encourage pregnant women should be consolidated to sustain the gain in Antenatal coverage. These efforts should be boosted in the health centres to ensure that they achieve the same level of success as the hospital

Also educational and community engagement exercises shown be pursued to ensure stakeholder involvement in antenatal care and protection of pregnant women against adverse cultural and economic burdens.

In a bid to improve uptake of IPTp and achieve high IPTp3+ coverage the following measures should be put in place;

Economically and socially marginalised segments of the populations should be given more attention in health promotion activities.

The health centre should be empowered with adequate knowledge and skills, as well appropriate resources to be able to provide quality antenatal services to their clients.

Antenatal services should be made more accessible and friendly to young pregnant women, to encourage them to patronise the services, including IPTp uptake.

The community should be engaged to remove the stigma associated with pregnancy among young people as these also have the potential to form a stumbling block to their access to antenatal care.

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APPENDIX

QUESTIONNAIRE

FACTORS CONTRIBUTING TO LOW IPTp 3 UPTAKE

ID Number:.....

Socio-demographic Information

1. Age:
a) <18years b)18-25 c) 26-34 d)35 and above
2. Locality:.....
3. Educational level:
a) None b) Primary c) JHS d) SHS e) Tertiary
4. Occupation:
a) Fishing/Farming b) Trader/Tradesman c) Civil servant d) Unemployed e) Others,
specify:.....
5. Marital status:
a) Single b) Married c) Divorced/separated d) Co-habiting
6. Religion:
a) Christian b) Moslem c) Traditionalist d) Others
7. Facility type:
a) Hospital b) Health centre c) CHPS d) Maternity home
8. Distance to facility(how long does it take to reach facility)
a) Very close b) Close c) Far d) Very far
9. Means of transport a) foot b)bicycle/motor bike c) car d) Others, specify:.....

Attitude of mothers towards ANC

10. Did you attend ANC during previous pregnancy? a)Yes b) No
11. If No to question 10, Why?
a) I didn't know I had to b) It's not important c) Clinic too far
d) I had no money e) Others, specify:.....
12. If Yes to question 10, how many times did you attend ANC?
a) 1 b) 2 c) 3 d) 4 and above
13. Was ANC card available? a) Yes b) No
14. How old was your pregnancy when you attended ANC for the first time?
a) First 3 months b) 4th -6th months c) 7th month and above d) I don't know
15. Were you told to come more than ones? a) Yes b) No
16. Were you given any education on benefits of coming more than ones? a) Yes b) No
17. If yes to 16, what were you told?.....

18. Were you satisfied with the attitude of staff? a) Very satisfied b) Satisfied b)Not satisfied

Knowledge of mothers on malaria in pregnancy

19. What is malaria?

- a) Febrile illness b) Spiritual illness c) STI d) I don't know
- e) Others, specify:.....

20. How do you acquire malaria? a) Spiritual attack b) Mosquito bite c} Sexually transmitted d) Don't know e) Others, specify:.....

21. What are the effects of malaria in pregnancy? a) Can cause anaemia b) Can cause death c) Nothing d) I don't know e) Other, specify.....

22. How do you prevent malaria? (Can choose more than one) a) Take herbal preparations b) Sleep under an insecticide treated net c) Use mosquito repellent b) Wear protective clothing, especially at night e) I don't know f) Other, specify.....

Knowledge on IPT for malaria prevention in pregnancy

23. Were you given any malaria medication? (Show sample of tablet to respondent)

- a) Yes b) No c) I don't know

24. If no to 23. Why? a) Not available b) I refused it c) I have allergic reaction to it d) I don't have malaria e) Others, specify:.....

25. Why do you think you were given the malaria medication?

- a) To prevent malaria b) To treat malaria c) To prevent me from dying d) To make my baby big thereby making labour difficult. C) I don't know

26. How many times did you take the malaria medication?

- a) Ones b) Twice c) 3 times and above

27. If less than three (3) time, why?

- a) No money to go to health facility b) Facility too far c) Had side effects
- d) Its not important e) No medications at facility f) I don't like g) baby will be too big

Thank you.

Part 1. Participant Information

Introduction

We are from Ensign College of Public Health in Kpong. We are conducting a study on the factors contributing to low uptake of intermittent preventive treatment of malaria in pregnancy 3(IPTp3) in the Biakoye District of Ghana.

We will be explaining all about the study to you. You are a volunteer, you can choose not to take part, and if you join, you may decide to quit at any time. There will be no penalty if you decide to quit study.

Why you are being asked to participate

You are being asked to take part of this study because you attended antenatal care in the Biakoye District and you delivered here and your baby is not more than one (1) year old.

Procedures

If you agree to be a part of the study, a trained project staff will ask you a series of survey questions alone for approximately 45 - 60 minutes.

Your responses will be recorded on paper and later entered into a computer database by study staff. As a participant, if you agree to participate in this study, data from your responses may be used as part of my assessment of the factors contributing to low uptake of intermittent preventive treatment for malaria in pregnancy 3(IPTp3) in the Biakoye District of Ghana.

Risk and Benefits

We anticipate minimal or no risk to you for being a part of this study. There is no direct benefit to you for being in the study; however knowledge gained will help us plan well to improve the uptake of IPTp from the third to the fifth dose.

Confidentiality

All data will be de-identified and will be kept private. Your identifiable data such as name or date of birth will not be used in documents, reports, or publications related to this research. We will keep all documents secured and under locked.

When typing your survey responses into the computer, all data will be entered without any information that will make it possible for your identity to be known. The information you provide will be kept strictly confidential and will be available only to persons related to the

study. The Office of Ethical Review Board of Ensign College may also have access to study records upon their request.

Your responses will not be shown to other participants or community members. The original paper survey forms will be destroyed once data entry is complete.

Voluntariness and Withdrawal

Your participation in the study is completely voluntary and you reserve the right not to participate, even after you have taken part, to withdraw. This is your right and the decision you take will not be disclosed to anyone. It will not affect the care that will be offered to you at the health facility now or in future. If you join the study, you can change your mind later. You can choose not to take part and you can quit at any time. There will be no negative consequences if you choose not to participate in the study. Please note however, that some of the information that may have been obtained from you without identifiers, before you chose to withdraw, may be used in analysis, reports and publications.

Cost/Compensation

Your participation in this study will not lead to you incurring any monetary cost during or after the study.

Who to contact

This study has been approved by the Institutional Review Board of Ensign College. If you have any concern about the conduct of this study, your welfare or your rights as a research participant or if you wish to ask questions, or need further explanations later, you may contact the research team (0202640514) of Ensign College of Public Health, or the Supervisor Dr. Enos Yartey (0504229909). You may also contact the Administrator of the Institutional Ethics Committee of the Ensign College of Public Health on +233245762229.

Thank you.

Do you have any questions?

Part 2. CONSENT DECLARATION

“I have read the information given above, or the information above has been read to me. I have been given a chance to ask questions concerning this study; questions have been answered to my satisfaction. I now voluntarily agree to participate in this study knowing that I have the right to withdraw at any time without affecting future health care services”

Name of **participant** _____

Signature of **Participant** _____

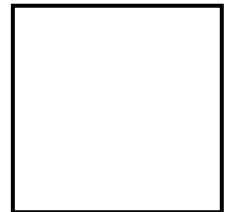
Date: / / 2017

Left thumbprint of
participant

Name of **witness** _____

Signature of **witness** _____

Date: / / 2017



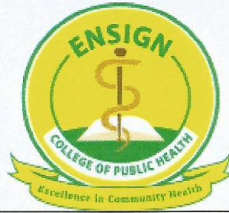
Name of **investigator** _____

Signature of **investigator** _____

Date: / / 2017

ENSIGN COLLEGE OF PUBLIC HEALTH - KPONG

OUR REF: ENSIGN/IRB/M2
YOUR REF:
Tel: +233 245762229
Email: irb@ensign.edu.gh
Website: www.ensign.edu.gh



P. O. Box AK 136
Akosombo
Ghana

21st November, 2016.

INSTITUTIONAL REVIEW BOARD SECRETARIAT

Isaac Tettey Sercom
Ensign College of Public Health.

Dear Mr. Secorm,

OUTCOME OF IRB REVIEW OF YOUR THESIS PROPOSAL

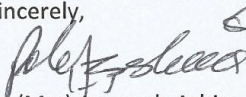
At a meeting of the INSTITUTIONAL REVIEW BOARD (IRB) of Ensign College of Public Health held on 16th and 17th November 2016, your proposal entitled "**FACTORS CONTRIBUTING TO LOW IPTp3 UPTAKE IN BIAKOYE DISTRICT OF GHANA**" was considered.

Your proposal has been approved for data collection in the following settings:

1. Provide written informed consent form.
2. National Service Personnel should be well trained and be in passion to provide health education and using nursing from adjoining districts.

We wish you all the best.

Sincerely,


Dr (Mrs) Acquaaah-Arhin
(Chairperson)

Cc. Dean of Ensign College.

Cc: Ag. Academic Registrar, Ensign College.

BOARD OF TRUSTEES:

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