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ADHERENCE TO TIMING OF FOCUSED ANTENATAL CARE AND FETAL OUTCOMES IN THE ACCRA METROPOLITAN AREA

BY

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DECLARATION

I confirm that this dissertation is a result of my own work and that any references/citations made within the works of other authors have been properly acknowledged. It has not been presented either in whole or part in any university for the award of another degree.

…….. ……

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DEDICATION

This dissertation is dedicated to my lovely wife Marian Naa Anyema Asah-Opoku for her unflinching support and encouragement throughout my master's programme in the School of Public Health, University of Ghana, Legon, our wonderful daughters Audrey and Phoebe.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

AIDS-	Acquired Immune Deficiency Syndrome
AMA-	Accra Metropolitan Assembly
ANC-	Antenatal Care
CHPS-	Community-Based Planning and Services
CI-	Confidence interval
ERC-	Ethical Review Committee
FANC-	Focused Antenatal Care
GDHS-	Ghana Demographic and Health Survey
GHS-	Ghana Health Service
GSS-	Ghana Statistical Service
HIV-	Human Immunodeficiency Virus
ICF-	Inner City Fund
JHS-	Junior High School
LI-	Legislative Instrument
MDG-	Millennium Development Goals
MMDA-	Metropolitan Municipal and District Assemblies
NICU-	Neonatal intensive care unit
OR-	Odds Ratio
SHS-	Senior High School
UN-	United Nations
UNICEF-	United Nations International Children's Emergency Fund
WHO-	World Health Organization

DEFINITION OF TERMS

Antenatal care (ANC): It is the care provided by skilled health-care professionals to pregnant women and adolescent girls in order to ensure the best health conditions for both mother and baby during pregnancy

Focused antenatal care: This is a goal-oriented antenatal care approach which aims at giving holistic individualised care to each woman to help maintain the normal progress of her pregnancy through timely guidance and advice.

Traditional antenatal model: This model assumes that frequent visits and classifying pregnant women into low and high risk by predicting the complications ahead of time, is the best way to care for the mother and the fetus.

The new WHO positive pregnancy experience model of antenatal care: Defined as maintaining physical and sociocultural normality, maintaining a healthy pregnancy for mother and baby (including preventing and treating risks, illness and death), having an effective transition to positive labour and birth, and achieving positive motherhood (including maternal self-esteem, competence and autonomy).

Parity: It is the number of times that a woman has given birth to a fetus at or after the gestational age of maturity, regardless of whether the child was born alive or was stillborn. In Ghana, the gestational age at maturity is twenty-eight weeks.

Primiparous woman: This refers to a woman who has given birth once.

Multiparous woman: This refers to a woman who has given birth more than once.

Postpartum woman: This refers to a woman who has delivered a baby after the period of maturity irrespective of whether the baby was delivered alive or dead.

Birth interval: This is the number of months between the birth of the child under study and the immediately preceding birth to the mother.

Fetal Apgar score: The Apgar score is a simple assessment of how a baby is doing at birth. The 1-minute score determines how well the baby tolerated the birthing process. The 5-minute score tells the health care provider how well the baby is doing outside the mother's womb.

Low birth weight: This refers to a birth weight less than 2.5kg.

ABSTRACT

Background

Antenatal care is an integral part of safe motherhood. The World Health Organization recommended a departure from the traditional routine non-evidence based to the four visit evidence–based focused antenatal care for low risk clients. The Ghana Demographic and Health Survey, 2014 reported that about 85 percent of pregnant women had four or more visits. However, whether these visits were consistent with the recommended gestational ages of visits or not is not known. This information is needed to enhance successful implementation of the new eight visit positive pregnancy experience antenatal care model introduced since November, 2016.

General objective

This study sought to determine the adherence to timing of focused antenatal clinic attendance and the fetal outcomes in the Accra Metropolitan area.

Methodology

A hospital based, quantitative cross-sectional study was carried out from 1st June to 30th June, 2017. An interviewer administered structured questionnaire and abstraction form was used to obtain data from 446 postpartum mothers who received focused antenatal care in the Accra Metropolitan Area. The data were entered into an Excel spreadsheet (Microsoft, 2010) and exported into Stata version 16 for analysis. In addition to descriptive statistics, bivariate regression analysis was used to test for association between the sociodemographic factors, obstetrics and gynaecological history and adherence to timing of focused antenatal care. The association between timing of focused antenatal care and fetal outcomes was also determined bivariate regression analysis. Multiple logistic regressions were used in the analysis of determinants of adherence to the timing of

focused antenatal care and the fetal outcomes. A confidence interval of 95% and $p<0.05$ was deemed to be statistically significant.

Results

Out of a total of 446 postpartum women who had focused antenatal care, 378(84.8%) had four or more visits. Among those who had 4 or more visits, 101 (26.7%) adhered to the recommended timing of focused antenatal care. Women who had correct timing of focused antenatal care were more likely to have had education up to Junior High School [AOR=3.31, 95% (1.03-10.61)] or Senior High School [AOR=4.47, 95% (1.14-17.51)]. They were also more likely to have had a history of abortion [(AOR=3.36, 95% (1.69-7.96)]. For every week increase in gestational age at booking at the antenatal clinic, respondents were 34% less likely to complete all four antenatal visits at the recommended times. [(AOR=0.66, 95% (0.60-0.73)]. Post-partum women whose ages were 25 years or more were 54% less likely to have babies with Apgar scores of 7 or more. [AOR=0.46, 95% (0.22-0.97)].

Conclusions

About 85% of women receiving focused antenatal care in the Accra Metropolitan area have four or more visits. Only 27% these women adhered to the recommended timing of focused antenatal care. Early initiation of antenatal care, high School education as well as women with a history of abortion were predictors for adherence to the timing of focused antenatal care. Women more than 25 years old were less likely to have good fetal Apgar scores at 1 minute. There is the need to educate women on the recommended timing of antenatal care especially as the WHO introduces the new 8 visit schedule for a positive pregnancy experience.

CHAPTER ONE

INTRODUCTION

1.1 Background

Antenatal care is the systematic medical supervision of the pregnant woman until she goes into labour or until elective caesarean section. The objective of antenatal care is to ensure that every wanted pregnancy results in safe delivery of a healthy baby and a good outcome for the mother as well (Cunningham, et al., 2014). It is an essential part of the safe motherhood programme and has several advantages. Antenatal care helps in the identification of risk factors, to enable monitoring of the pregnant woman and the fetus. It is an important aspect of the healthcare system of any country and is an avenue for picking up conditions that are associated with poor maternal and perinatal outcomes and helps to provide preventive and curative health services (Mbuagbaw et al., 2015).

As a safe motherhood intervention, it also helps to deliver the appropriate level of medical care according to the patients risk status: from the most basic Community Based Health Planning and Services (CHPS) compound to the most sophisticated tertiary facility. In addition to these, antenatal care is an avenue to educate patients about nutrition, personal hygiene and birth preparedness and provides physical, social and psychological preparation for the pregnant woman. Furthermore it helps to prepare the mother for a successful breastfeeding experience, helps to reduce complications during the puerperium and prepares the mother to take care of the child physically, psychologically and socially (Ekabua, Ekabua, & Njoku, 2011). The main types of antenatal care are the traditional and focused antenatal care. The traditional antenatal model comprises the following: one visit each month during the first 6 months of pregnancy, once every 2–3 weeks for the next 2 months, and once a week thereafter until delivery (Villar et al., 2001). In Ghana however, the schedule was monthly up to 28weeks, fortnightly from 28 to 36 weeks and weekly from

36th week to delivery, (Nyarko, Armar-Klemesu, Deganus, & Odoi-Agyarko, 2006). This model has been carried out for years without scientific evidence to back the appropriateness of the number of visits. The several visits to the hospital also increased the cost of antenatal care to clients. The practice of modern medicine however, is hinged on an evidence based approach.

In the 1990s Villar et al., working under the ambit of the World Health Organization (WHO) compared the traditional 12 visit antenatal to a standard four visit schedule which was designed with specific interventions at specific times and found no significant differences in terms of maternal and perinatal outcomes. This four visit model, known as the WHO focused antenatal care model has become a benchmark for measuring the adequacy of antenatal care (Villar et al., 2001).

In 2001, a systematic review under the auspices of the WHO carried out by Carroli et al. concluded that there was no difference between the focused antenatal care and the traditional antenatal care with regards to fetal and maternal outcomes. There was some dissatisfaction with focused antenatal care especially among women from developed countries because of fewer contacts with their care-givers, however the new model was cost effective (Carroli et al., 2001). The WHO focused antenatal care is a package comprising four antenatal visits at specific gestational ages with targeted interventions (World Bank, 2002). The first antenatal visit should occur before the twelfth week of pregnancy and expected to take 30-40minutes. The second visit is scheduled close to the twenty sixth week and expected to take about 20 minutes. The third visit should be close to the thirty- second week and should last 20 minutes. The fourth visit should be between 36 to 38 weeks. For late enrolment and missed visits patients are to have their first visit activities and those that are scheduled for the present visit. A postpartum visit is scheduled for a week after delivery (World Bank, 2002).

The Government of Ghana adopted the WHO focused antenatal care (FANC) package in 2002 to improve access, quality and continuity of ANC services to pregnant women, (Nyarko et al., 2006). In Ghana the first antenatal visit for the focused antenatal care is at a gestation less than 16weeks. The second visit is between 20 to 24weeks. The third visit is between 28 to 32 weeks and the fourth visit at 36 to 40 weeks. (Nyarko et al., 2006) In addition to the general objectives of antenatal care focused antenatal care in Ghana includes special education on family planning, immunization, reproductive tract infections including sexually transmitted infections, HIV and AIDS and prevention of mother to child transmission of HIV/AIDS (Nyarko et al., 2006). In Ghana, the Ministry of Health has exempted fees for four visits for women attending ANC which includes free delivery care. This is to remove intra-facility cost of antenatal care as an impediment to antenatal care (Ministry of Health, 2014).

Though focused antenatal care has been widely accepted as it is evidence- based, there are some concerns about it. For example in a study in Lagos, Nigeria, about the preferences, practices and acceptance of focused antenatal care versus standard prenatal care models among Nigerian Obstetricians using a cross-sectional survey in 2013, only 34.8 percent of 201 respondents had a preference for focused antenatal care while only 3 percent used the model in clinical practice. Eighty five percent (85%) of the respondents recommended that focused antenatal care should be modified to meet local national and cultural needs (Ezeonu et al., 2015).

1.2 Problem statement

In 2012, the number of women in low and middle income countries attending at least one antenatal care increased to 83 percent from 63 percent in 1990. Those attending four or more antenatal visits increased from 37 percent to 52 percent over the same period however

maternal and neonatal mortality continued to be high in several countries with appreciable levels of antenatal care coverage (*United Nations. Millenium Development Goals Report*, 2014). A lot of premium has been placed on the coverage of the four or more WHO focused antenatal visits as an important maternal and perinatal health index. Four or more antenatal visits was used as a proxy for adequacy of antenatal care and it has been used as an indicator for the Millennium development goal 5 (improve maternal health) (indicators for monitoring MDG goals).

The Ghana Demographic and Health Survey (GDHS) (2014) reported that 87 percent of pregnant women in Ghana had four or more antenatal care visits. The median duration of pregnancy at the first antenatal visit was 4.6 month (Ghana Statistical Service (GSS), Ghana Health Service (GHS) & ICF Macro International, 2014) . Though the components of antenatal care are stated in this report, the proportions of women attending the second, third and fourth antenatal visits at the recommended times are not stated. There has been a growing concern about the increase in the numbers of pregnant women attending four or more antenatal care with less satisfactory decrease in the perinatal morbidity and mortality. This gap has prompted the need by stakeholders to place greater emphasis on the quality of care during focused antenatal care services rather than just four or more visits. There is lack of data on the adherence to the recommended timing of all the four visits in focused antenatal care in Ghana and fetal outcomes following adherence to timing of focused antenatal visits.

1.3 Rationale of study

Adherence to the recommended timing of focused antenatal visits allows for the various interventions in focused antenatal care to be carried out at the right times in order to achieve the desired goal of reducing perinatal morbidity and mortality.

This study will provide information on the proportions of pregnant women attending focused antenatal care at the recommended times. It will also help in identifying the determinants of adherence to this recommended timing as well as the fetal outcomes following the correct timing of focused antenatal care. This information will provide invaluable insight into the quality of care during focused antenatal care services in Accra, Ghana and help in the formulation of policies to improve our current focused antenatal care for low risk patients.

1.4 General objective

To determine the adherence to timing of focused antenatal clinic attendance and the neonatal outcomes in the Accra Metropolitan area.

1.5 Specific objectives

1. To determine the proportion of women who have four or more focused antenatal care visits
2. To determine the proportions of pregnant women attending four or more focused antenatal care at the recommended times.
3. To assess the determinants of adherence to recommended timing of four or more focused antenatal visits.
4. To assess the fetal outcomes of clients receiving four or more focused antenatal visits.

1.6 Research questions

1. What proportion of pregnant women in the Accra Metropolitan Area attend four or more focused antenatal visits?

2. What proportion of clients who have four or more focused antenatal visits report within all the four recommended times for care?

3. What are the determinants of adherence to the recommended timing of focused antenatal care among clients who have four or more antenatal visits?

4. What are the fetal outcomes of clients receiving four or more focused antenatal visits?

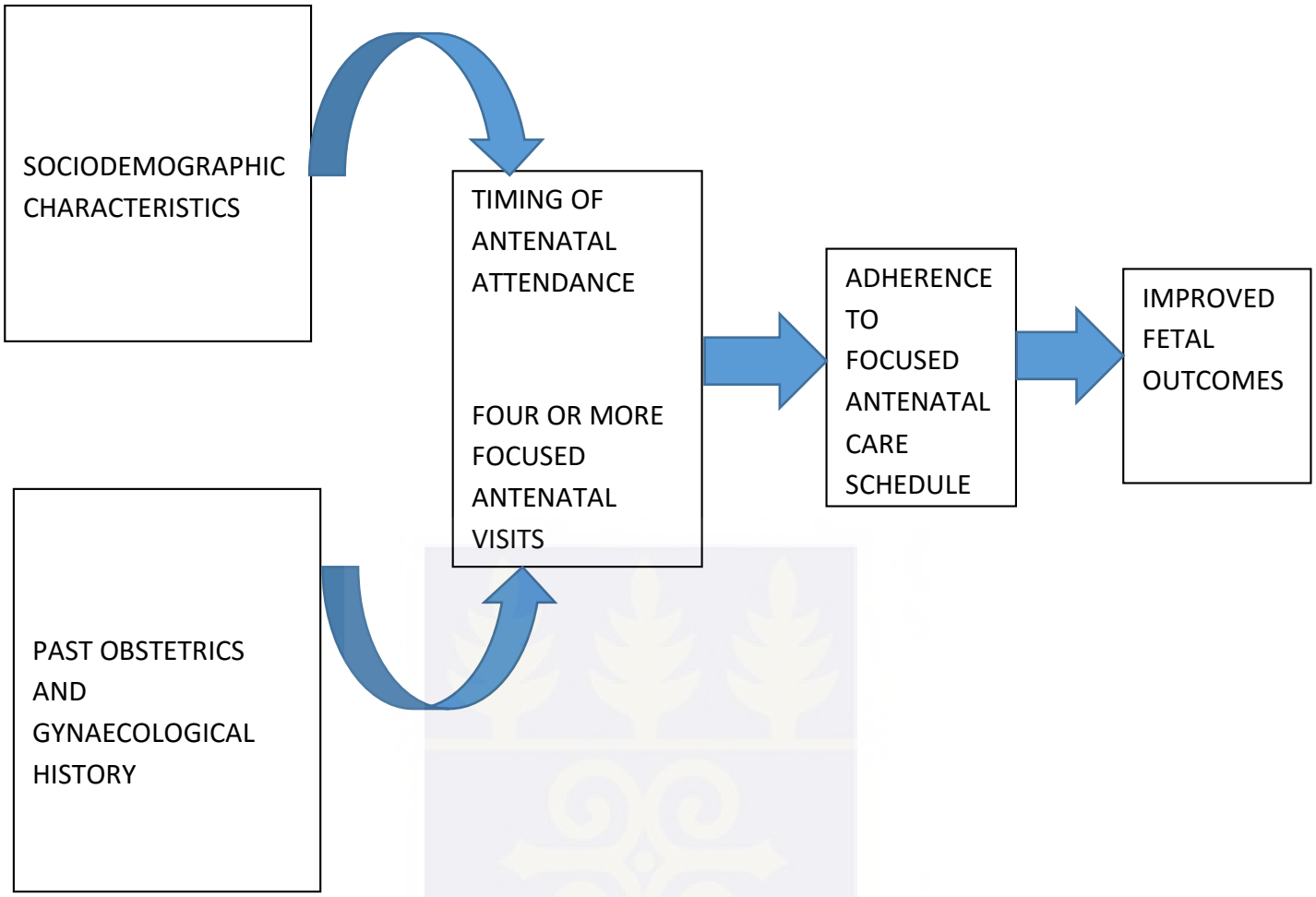

Figure 1: Conceptual framework

ADOPTED FROM THE WHO MODEL OF FOCUSED ANTENATAL CARE(World Bank, 2002)

1.7 Narrative on conceptual framework

The quality of antenatal care impacts on the perinatal outcomes. Antenatal care attendance schedule had been traditionally ritualistic until the introduction of the four-visit World Health Organization (WHO) focused antenatal care for low risk pregnancies which was evidence based. Focused antenatal care has comparable pregnancy outcomes to the traditional 12 visit antenatal care model (Villar et al., 2001).The visits are scheduled for various gestational ages of the pregnancy to optimise outcomes. The first visit is at a gestational age of pregnancy less than 16weeks, the second visit is between 20 to 24 weeks,

the third visit between 28 and 32weeks and the last visit at 36 to 40 weeks (World Bank, 2002).

The socio-demographic characteristics of clients may directly affect the timing and number of antenatal visits. Clients resident in urban areas, of high educational level and also belonging to the higher wealth quintile are likely to attend antenatal care at the right times and also complete four or more visits to the antenatal clinic (Andrew et al., 2014; Ghana Statistical Service (GSS), Ghana Health Service (GHS), & ICF Macro International, 2014).

Poor pregnancy outcomes in the preceding pregnancy and a current pregnancy that is planned may lead to adherence to the number and timing of focused antenatal care. Clients place of residence, educational level, wealth quintile and occupation of partner may indirectly affect the quality of focused antenatal care. A planned pregnancy may lead to an increase in the number and proper timing of focused antenatal care. Having several children may be associated with decreased compliance to focused antenatal care (Andrew et al., 2014; Manzi et al., 2014). A favourable pregnancy outcome in the preceding pregnancy is likely to indirectly increase the compliance to focused antenatal care. Birth intervals less than 2 years is likely to result in poor adherence to the timing of focused antenatal care (Titaley, Dibley, & Roberts, 2010). The quality of focused antenatal care is hinged not only on the 4 or more visits to the antenatal clinic but particularly on the proper timing and adherence to the stipulated processes and procedures during each visit (Andrew et al., 2014; Tran, Gottvall, Nguyen, Ascher, & Petzold, 2012 ; Pell, Menaca, Were, Afrah, Chatio, Manda-Taylor, Hamel, Hodgson, Tagbor, Kalilani, & Ouma, 2013). Adherence to the requisite timing of antenatal visits may lead to increased quality of focused antenatal care. Carrying out of various procedures such as giving of anti-malarial medications, tetanol injection, various blood and urine investigations and counselling of clients on the danger signs of pregnancy are likely to improve the quality of focused antenatal care and ultimately may

improve the maternal and perinatal mortality rates (Villar & Per, 1997). The timing of these procedures and processes is important to achieve reduction in perinatal morbidity and mortality. For example adverse outcomes of Syphilis can be prevented by testing for it in the first and second trimesters of pregnancy (Hawkes, Gomez, & Broutet, 2013). Poor attendance to antenatal care for example may likely lead to low birth infants (Mbuagbaw et al., 2015).

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

The timing of focused antenatal care is generally affected by various socio-demographic and obstetrics and gynaecological characteristics of postpartum women. Adherence to timing of focused antenatal care has impact on the fetal outcomes.

2.1 Timing of focused antenatal care

The recommended timing of the first antenatal care is an independent predictor of the content of care received by pregnant women. Women who report on time for the first focused antenatal care often complete the whole range of interventions scheduled for them when compared with those who report late (Agha & Tappis, 2016). Conrad et al (2012) found out that women in their third trimester who reported to health facilities for the first time did not receive any education on the danger signs of pregnancy. This group constituted 29 percent of antenatal women in Nouna in Burkina Faso and 29 percent in Iganga in Uganda (Conrad, Schmid, Tientrebeogo, Moses, & Kirenga, 2012).

In a household survey in the Sindh Province of Pakistan in 2013, it was found out that 59.6 percent of urban women and 36.2 percent of rural women receive their first antenatal care within 12 weeks of becoming pregnant. The average number of women receiving antenatal care within the first three months was 47.9 percent. This was however a community based study that focused on only the proportions of women who receive their first antenatal care timeously (Agha & Tappis, 2016). The GDHS (2014) shows that 64 percent of pregnant women had their first ANC visit before the fourth month compared to 55 percent recorded by the GDHS in 2008. Out of those who received their first ANC before 12 weeks as per the 2014 GDHS the proportion in urban areas were more than those in the rural areas.(68%

versus 61%) (Ghana Statistical Service (GSS), Ghana Health Service (GHS), & ICF Macro International, 2014). The GDHS however did not explore the proportions receiving antenatal care during the second, third and fourth visits.

In an analytical cross-sectional survey on the timing of antenatal care by adolescents and adults in Eastern Tanzania in 2008, 29 percent of the 405 women initiated antenatal care in the first 4 months. Overall, pregnant women made their first visit at a mean of 5.1 months (SD=1.2, range=2.8). Fifty-six percent of the participants judged their first visit to be late. This study was carried out in the rural districts of Tanzania and focused on the first antenatal visit. It did not explore the timing of the subsequent antenatal visits and the determinants of these subsequent visits (Gross, Alba, Glass, Schellenberg, & Obrist, 2012). In a study on the quality-coverage gap in antenatal care: towards better measurement of effective coverage which used secondary data from demographic and health surveys of 41 countries the median of pregnant women receiving their first antenatal care before 4 months was 57 percent giving a median quality- coverage gap of 43 percent. Again this study focused on the first antenatal care and the package of clinical preventive services given (Hodgins & Agostino, 2014). According to the Ugandan Demographic and Health Survey, 2011, only 48 percent of pregnant women make 4 or more visits during their entire pregnancy. Only about one-fifth (25%) of women made their first visit before 4 months (Ugandan Bureau of Statistics, 2011). Tran and colleagues reported 87.4 percent of pregnant women in Vietnam receiving their first antenatal care in the first trimester between April 2008 and December, 2009 (Tran et al., 2012). In a population based cross-sectional survey in women who had recently delivered in rural Kenya 64 percent had their first antenatal visit in the third trimester (Eijk et al., 2006).

The average gestational age at booking in North Central Nigeria has been reported to be 19.1±7.8 weeks (Ifenne & Utoo, 2012). Nyarko et al (2006) in a study on the acceptability

and feasibility of introducing the WHO focused ANC package in Ghana in 2006 found out that only 8 percent of the focused antenatal care attendants knew that they were scheduled for four visits (Nyarko et al., 2006).

The WHO since November, 2016 has introduced a new schedule for antenatal care known as the new guidelines on antenatal care for a positive pregnancy experience. This is a new guideline which will replace the current 4 visit focused antenatal care schedule. It comprises of eight or more contacts for antenatal care and can reduce perinatal deaths by up to 8 per 1000 births when compared to 4 visits. It prescribes that pregnant women have their first contact in the first 12 weeks' gestation, with subsequent contacts taking place at 20, 26, 30, 34, 36, 38 and 40 weeks' gestation.(Tunçalp et al., 2017)

2.2 Determinants of adherence to focused antenatal care

2.2.1 Age

Women between ages 15 to 24 have been reported to be more likely to have their first antenatal care before 3 months after conception (Agha & Tappis, 2016). In a cross-sectional study by Amoakoh-Coleman et al of eleven health facilities in the Greater Accra Region of Ghana to determine the client factors that affect adherence to clinical guidelines during the first antenatal care they found out that maternal age was a significant factor that determined provider adherence to first ANC guidelines. They realised that maternal age 20-25years had an odds of 1.81 of complete provider adherence to first ANC guideline compared to age less than 20years (Amoakoh- Coleman M, Agyepong AI, Kayode GK, Grobbee ED, Klipstein-Grobusch K, 2016). In South Eastern Tanzania no difference has been found between adolescents and adults with regards to timing of the first antenatal care (Gross et al., 2012).

2.2.2 Wealth

Agha and colleague found out in the Sind Province in Pakistan that the median time for first antenatal care was three months for those in the richest wealth quintile and 7 months for those in the poorest wealth quintile (Agha & Tappis, 2016). About 28 percent of pregnant women in Kampala, Uganda reported after 20 weeks of gestation for their first antenatal care because they did not have money to pay for their transportation fares (Kisuule et al., 2013). In a cross-sectional study in North Central Nigeria, 9.2 percent of respondents booked for antenatal care after 17 weeks of gestation because of financial constraints (Ifenne & Utoo, 2012). Both the poor and wealthy have been reported to have access to the same quality of health even though the poorest women report receiving fewer antenatal interventions (Barber, Gertler, & Harimurti, 2007).

2.2.3 Parity

Women with just one living child are more likely to report for their first antenatal care within months. Nearly 60 percent (59.6%) of women with just one living child reported for their first antenatal care within three months in Sind province in Pakistan (Agha & Tappis, 2016). Qualitative studies in Madang, Papua New Guinea showed that a higher parity was associated with late reporting for the first antenatal visit. In a cross-sectional study in Rwanda on the predictors of delayed antenatal care using secondary data from demographic and health surveys Manzi et al reported that a parity of 4 or more children, was associated with first antenatal attendance after the first trimester (Manzi et al., 2014). Primiparity is associated with early initiation of antenatal care (Gross et al., 2012).

2.2.4 Age at marriage

Women who got married at age twenty one or older are more likely to report for their first antenatal care within three months compared to those who got married before age 16 (Agha & Tappis, 2016). In Jordan however, age at marriage has not been found to be a significant

determinant of utilization of antenatal care services (Simkhada, Teijlingen, Porter, & Simkhada, 2007).

2.2.5 Employment status

Employment status has been found to have a strong association with timing of first antenatal care. A cross-sectional study in the Greater Accra Region of Ghana showed those employed had an odds of 1.77 that of those without employment for complete adherence to first antenatal care guidelines (Amoakoh- Coleman M, Agyepong AI, Kayode GK, Grobbee ED, Klipstein-Grobusch K, 2016). In Pakistan, women who were gainfully employed were less likely to adhere to timing of focused antenatal care when compared to women who were homemakers (Mumtaz & Salway, 2007).

2.2.6 Education status of women

Women who have less than 8 years of education have three times the odds of not attending more than three antenatal visits compared to those with more than 8 years of education (Eijk et al., 2006). A study in Pakistan showed that women who had only primary education had an odds of 1.7 times that of those without any formal education for adherence to antenatal guidelines whiles those with secondary and tertiary education had an odds of 4.6 and 9.46 times those without any formal education respectively (Mumtaz & Salway, 2007).

2.2.7 Marital status

Being married has been shown to be significantly associated with compliance to the recommended timing of antenatal care (Manzi et al., 2014). In Kenya however, marital status has not been found to be a significant determinant of adherence to timing of antenatal care (Eijk et al., 2006).

2.2.8 Index pregnancy planned or unplanned

Planned pregnancies are associated with adherence to the timing of the first antenatal care (Manzi et al., 2014). In Brazil women with unplanned pregnancies have an odds of two times that of those with planned pregnancies for inadequate antenatal care (Bassani et al., 2016).

2.2.9 Accessibility of health facility

In a cross-sectional study in Nigeria, 2.2 percent of respondents reported late for their first antenatal care (≥17 weeks) because of unavailability of transportation services to the healthcare facility (Ifenne & Utoo, 2012). A qualitative study in Madang, Papua New Guinea has also highlighted longer distances from place of residence of pregnant women to health facilities as a barrier to adherence to timing of the first antenatal care (Andrew et al., 2014).

2.2.10 Attitudes to antenatal care

Previous negative experiences at the antenatal clinic such as long waiting times and unannounced closure of the clinic, shapes up a poor attitude towards attendance of antenatal care. Some women also perceive attending antenatal care as an opportunity cost for losing out on their income generating activities. Such women report late for their first antenatal care (Andrew et al., 2014). A perceived lack of quality in the ANC was associated with a late first ANC visit in rural Kenya (Eijk et al., 2006). A desire to limit the number of clinic attendance has been associated with late reporting for the first antenatal care. About 5 percent of respondents in a study in Nigeria reported late for their first antenatal care because they wanted to limit the number of antenatal visits (Ifenne & Utoo, 2012).

2.2.11 Outcome of previous pregnancy

Poor outcomes such as miscarriage or stillbirth in the previous pregnancy, has been found to be associated with early initiation of antenatal care (Gross et al., 2012).

2.2.12 Knowledge about the recommended times for antenatal attendance

A poor knowledge of the recommended times for antenatal attendance has been associated with poor adherence to the timing of antenatal care. In a study in Mulago hospital in Uganda, 72.7 percent of participants did not know when they were to report for their first antenatal visit (Kisuule et al., 2013).

2.2 13 Healthcare provider attitude

A poor healthcare provider attitude in a previous antenatal attendance is a significant predictor of poor adherence to timing of focused antenatal care. Some of these poor attitude include poor communication skills and perceived lack of quality care (Andrew et al., 2014; Gross et al., 2012).

2.2.14 Co-operation of partners

Poor support from husbands has been associated with poor timing of antenatal care. In a study in Nigeria, 3.9 percent of respondents reported late for their first antenatal visit because of uncooperation from their spouses (Ifenne & Utoo, 2012).

2.2.15 Number of living children

Pregnant women with 1-2 living sons are 19 percent less likely to adhere to antenatal care guidelines compared to those with no living sons whiles those with three or more living sons are 52 percent less likely to adhere to antenatal care guidelines (Mumtaz & Salway, 2007).

2.3 Outcomes of focused antenatal care

2.3.1 Delivery in a health facility

Women who have four antenatal visits are 7.3 times more likely to deliver in a health facility compared to those who did not have any antenatal care (Guliani et al., 2012). In a population based cross-sectional study in rural Zambia among women who had recently delivered, 90 percent attended antenatal care once. Sixty-four percent had their first visit in the third trimester with as many as 80 percent delivering outside the health facility including the traditional birth attendants, lay people and delivery without assistance (Eijk et al., 2006).

2.3.2 Birthweight

Low birth weight is a strong predictor of infant and child mortality. It is an indicator for the quality of prenatal care (WHO and UNICEF, 2003). Children born with low birth weight are at risk of development of hypertension, ischaemic heart disease, type 2 diabetes mellitus and obesity in later adult life (Walker, Gaskin, Powell, Bennett, Forrester, 2001). In a study in Mexico on the influence of timeliness, frequency and content of antenatal care on birth weight , Servan Mori and Colleagues found out that frequency, timeliness and content of focused antenatal care independently affected the birthweight of the newborn (Servan-mori, Sosa-rubı, Najera-leon, & Darney, 2016). Multiparous women presenting for their booking visit after 16 weeks have been shown to have a higher risk of low birth weight (Gissler M, 1994).

2.3.3 Prematurity

Both primiparous and multiparous women presenting for their booking visit after 16 weeks have been shown to have a higher risk premature infants (Gissler M, 1994).

2.3.4 Infant deaths

About two-thirds of infant deaths could be prevented with adequate antenatal care together with interventions during the perinatal and postpartum periods (Ronsmans, Chowdhury, Dasgupta, Ahmed, 2010). The timing of the first antenatal care visit however has not been found to correlate well with the occurrence of still births (Beauclair, Petro, & Myer, 2014). This study however did not consider the effects of the other antenatal visits on the occurrence of still births. Strict adherence to timing of antenatal care enhances serial plotting of fundal height which increases the detection of small for gestational age foetuses antenatally. Small for gestational age foetuses are associated with over 50 percent of stillbirths and 42 percent of early neonatal deaths (Gardosi, Madurasinghe, Williams, & Malik, 2013; Roex, Nikpoor, Eerd, Hodyl, & Dekker, 2012).

CHAPTER THREE

MATERIALS AND METHODS

3.1 Study design

The study was a hospital based quantitative cross sectional study carried out from the 1st of June to the 30th of June, 2017. Primary data on sociodemographic characteristics and obstetrics and gynaecological history was obtained from postpartum women using an interviewer administered questionnaire and data abstraction forms. Data was analysed using Stata 16 to determine the factors associated with adherence of focused antenatal care and the fetal outcomes.

3.2 Study area

The study was conducted in the Accra Metropolitan Area

3.2.1 The Accra Metropolitan Assembly (AMA) -It is one of the two hundred and sixteen (216) Metropolitan, Municipal and District Assemblies (MMDAs) in Ghana and among the sixteen (16) MMDAs in the Greater Accra Region. It was established in 1898 but has gone through several changes in terms of name, size and number of Sub-Metros since then. When Ghana returned to constitutional rule in 1993, it is guided by Local Government Act, 1993, (Act 462) and under Legislative Instrument (L.I.2034)(Accra Metropolitan Assembly, 2013).

It is bounded on the East by the La Dade-Kotopon Municipality, south by the gulf of Guinea, West by the Ga South and central Municipality and in the North by Ga West, and La-Nkwantanang Municipalities. It is currently made up of ten sub metro areas namely Ablekuma Central, Ablekuma North, Ablekuma South, Ashiedu Keteke, Ayawaso Central, Ayawaso East, Ayawaso West, Okaikoi North, Okaikoi South and Osu Klottey. La-Dadekotopon Municipal Assembly which used to be one of the Sub-Metros was elevated to

an autonomous Assembly in June, 2012. According to the 2010 Population and Housing Census of Ghana, the population of the municipality was approximately 1.7million with a growth rate of 3.36 percent per annum. In the AMA 65.78 percent of the populace are 18years and above. Females make up 52 percent of the population; the sex ratio female to male is 1.03 to 1.00(Accra Metropolitan Assembly, 2013).

There are four Ghana Health Service hospitals in the Accra metropolis namely the Princess Marie Louise Childrens Hospital, Achimota Hospital, Ridge Hospital, Accra and the Maamobi General Hospital. The Princess Marie Louise Hospital attends to only children. The three remaining hospitals, the Ridge Hospital Accra, the Achimota Hospital and the Maamobi General Hospital were considered for this study.

3.2.2 The Ridge hospital

It is located within the Accra Metropolitan area and in the Osu Clottey sub-district. Annual deliveries at Ridge Hospital is 8432. Out of the 24 deliveries per day, 17 attended the focused antenatal care. The Obstetrics and Gynaecology unit has 87 beds. It is manned by one consultant obstetrician gynaecologist, two specialist obstetrician gynaecologist, 4 medical officers, 81 midwives and senior registered nurses, 6 enrolled nurses, 5 ward assistants, one health extension officer and 15 orderlies(Ridge Hospital Accra, 2015 Annual Report).

3.2.3 The Achimota Hospital

The Achimota Hospital is located in the Accra Metropolitan area in the Ayawaso Sub-district. The Obstetrics and Gynaecology Department is manned by one consultant, one specialist and one medical officer. There are about 18 practicing midwives in the department. The Achimota Hospital recorded an annual delivery of 3000. Out of 8

deliveries per day 6 would have attended focused antenatal care(Achimota Hospital, 2015 Annual Report).

3.2.4 The Maamobi General Hospital

The Maamobi General Hospital is located in the Ayawaso sub district of the Accra Metropolitan area. Its staff include one consultant obstetrician gynaecologist, 2 specialists and one medical officer. It also has 36 practicing midwives. The Maamobi General Hospital has an annual delivery rate of 1926. Out of the total number of 5 deliveries in a day 3 would have attended focused antenatal care. (Maamobi General Hospital, 2015 Annual report)

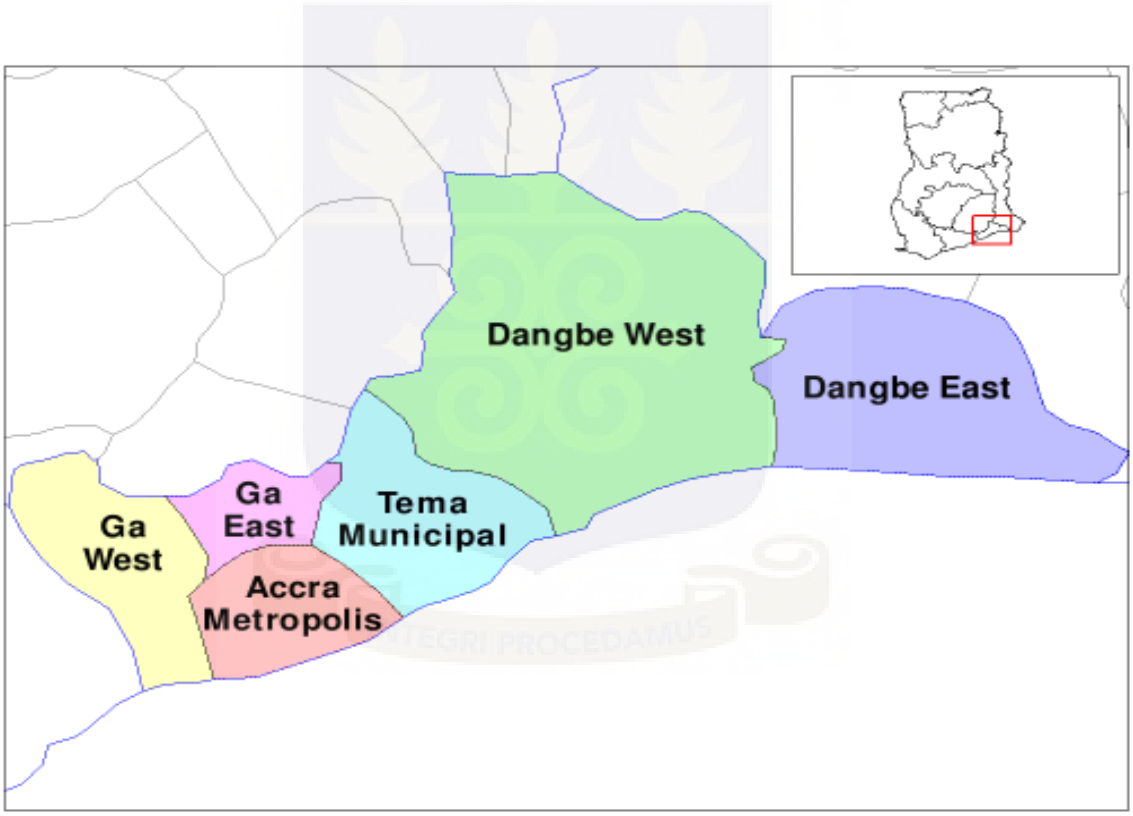

Figure 2: Map of Ghana showing the Accra Metropolitan Area

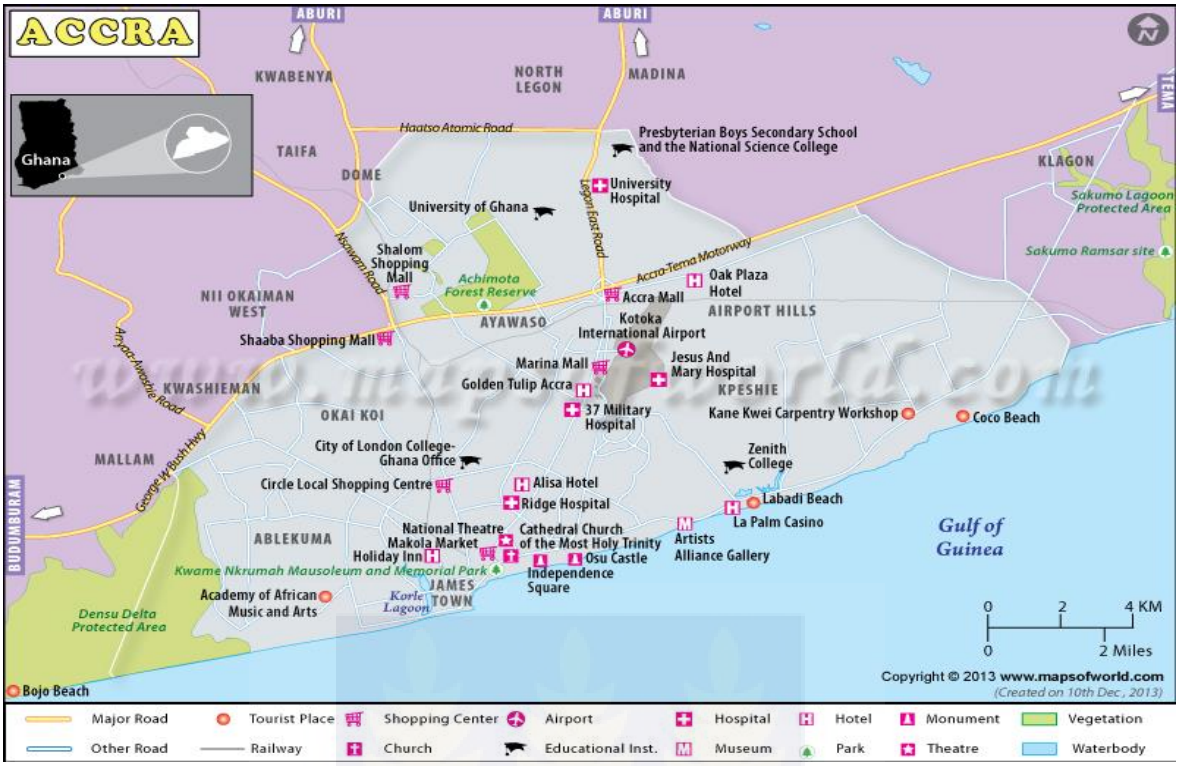

Figure 3: Map of the Accra Metropolitan Area

3.3 Study population

Postpartum mothers who had had focused antenatal care at the Ridge, Achimota and Maamobi Hospitals were interviewed in the post-partum ward on the first day after delivery. Postpartum mothers were recruited in order to have access to their completed antenatal attendance records. Also the lying in wards were chosen to enable the capture of data from mothers with poor outcomes who were likely to be absent at the postnatal clinic.

3.4 Inclusion criteria

1. Postpartum women who had focused antenatal care and on admission at the postnatal wards at the Ridge, Achimota and Maamobi Hospitals who had their antenatal care in the respective hospitals.
2. Women who consented to be part of the study.

3.5 Exclusion criteria

1. Postnatal women whose maternal health records and delivery summaries could not be traced.
2. Women who declined to participate in the study.
3. Post- partum women who were too ill to be interviewed.

3.6 Variables

3.6.1 Dependent or outcome variables

The primary outcome was adherence to the recommended timing of all four focused antenatal visits by Ghanaian standards. (Nyarko et al., 2006). The secondary outcome was fetal outcome which included birth weight, outcome of delivery (Baby alive or dead), Neonatal Apgar scores and admission to NICU.

3.6.2 Independent or predictor variables

Socio-demographic characteristics and past obstetrics and gynaecological history were the primary independent variables. Adherence to recommended timing of all four antenatal visits (served as independent variable for only fetal outcomes).

3.7 Sample size determination

The sample size was calculated using the formula for cross-sectional study for an infinite population. (Kish L, 1965)

$$N = \frac{\left(z_{1-\alpha/2}\right) 2 \; p(1-p)}{d^2}$$

N = required sample size

Z1-α/2 = confidence level of 95% (standard value of 1.96)

p = percentage of postpartum women who attended all four antenatal visits at the recommended time was assumed to be = 50%=0.5

1-p = proportion of postpartum women not attending all four antenatal visits at recommended time

= 1-0.5= 0.5

d = allowable margin of error=5%

Thus, the sample size was calculated as follows

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

$$N=\frac{3.8416 \text{ X } 0.5\text{X } 0.5}{0.0025}$$

$$N=\frac{0.9604}{0.0025}$$

N=384.16

N=385 participants.

Upward adjustment for incomplete data and inconsistencies =20%.

Hence minimum sample size = 462

3.7.1 Assumptions

Available data on the proportion of pregnant women attending four antenatal visits=87% (Ghana Statistical Service (GSS), Ghana Health Service (GHS), & ICF Macro International, 2014). Proportion of pregnant women attending the first antenatal visit before 16 weeks=64%(Ghana Statistical Service (GSS), Ghana Health Service (GHS), & ICF Macro International, 2014).There is lack of data on the proportions of pregnant women receiving all four visits at the recommended times(p). P was therefore assumed to be = 50% as this will give the highest minimum sample size.

3.8 Sampling method

The Accra Metropolitan Area has four main hospitals. The Ridge, Maamobi, Achimota and Princess Marie Louise Hospitals. The latter does not conduct deliveries and therefore the first three hospitals were selected purposively for the study.

The number of deliveries per day was entered in a register on the postnatal ward. Postnatal women who underwent focused antenatal care were identified through their antenatal caregivers as indicated in their maternal health records booklet. The mothers who delivered the previous day and confirmed to have undergone focused antenatal care from their maternal health records booklet were serially numbered.

From the minimum sample size of 462 and with 28days for data collection, 17 postnatal women at the postnatal wards were selected per day. The ratio of focused antenatal women who deliver at the Maamobi General Hospital to Achimota Hospital to those who deliver at the Ridge Hospital was 1:2:6. Therefore 2 postnatal mothers out of 3 who attended focused antenatal care at the Maamobi General Hospital were selected daily, 4 out of 6 postnatal women who attended focused antenatal care at the Achimota Hospital were selected daily

whiles 11 postnatal women out of 17 who attended focused antenatal care at the Ridge Hospital were selected daily. All selection was done by simple random sampling. Simple random sampling was done by numbering the folders of postnatal mothers and writing the numbers on pieces of papers which were put in an opaque envelope and then the numbers required per day as indicated above were picked blindly with replacement. If a number that had been picked already was picked up again it was replaced until a different number was picked.

3.9 Data collection method

Data were collected from postpartum mothers through interviews and chart reviews of their medical records. Each interview lasted about 15 minutes.

3.10 Data collection instruments

The data collection instruments were an interviewer administered questionnaire and a data abstraction form.

The questionnaire was used to collect data on the determinants of adherence to correct timing of all four focused antenatal visits. Information obtained included socio-demographic characteristics and obstetrics and gynaecological history. The timing of all antenatal visits and fetal outcomes were captured using the data abstraction forms from the maternal health records booklet and from delivery notes. An antenatal visit or more attended within the recommended timing for focused antenatal care was captured as correct adherence to the recommended timing of antenatal care. Fetal outcomes included weight of baby, whether baby was born alive or dead, Apgar scores at 1 and 5 minutes and admission to NICU.

3.11 Data processing

At the end of each day of data collection, administered questionnaires were cross checked for completeness and internal consistency. The data were entered into Microsoft Office Excel 2007.The data entry sheet was designed with appropriate variable definition in place and consistency checks to minimize error during the data entry. The data were doubly entered by the principal investigator and two trained research assistants. This helped in detecting any discrepancy by running frequency checks on both sets of data. The data were then cross checked and the necessary corrections were made for accuracy of the final entered data.

3.12 Data analysis

The final data from the field were entered into Microsoft Office Excel 2010 then exported into STATA version 16 (Stata Corporation, College Station, TX, USA) for analysis. The data analysis was done and presented as follows:

The results were presented in summary tables and charts and analyzed using frequencies, means, proportions and percentages. Pearson's Chi square test was performed on categorical data to test association between the sociodemographic factors, obstetrics and gynaecological history and adherence to timing of focused antenatal care. The association between timing of focused antenatal care and fetal outcomes was also determined using Pearson's chi square test. Multiple logistic regressions were used in the analysis of determinants of adherence to the timing of focused antenatal care. Variables that were significant at the bivariate level were included in the logistic model. Odds ratio (OR) and their 95% confidence intervals (CI) were used to test the strength of association. In all the statistical procedure a ρ- value of less than 0.05 was used to determine statistical significance.

Clients were grouped into 3:

(i) Those who had less than 4 visits

(ii) Those who had 4 or more visits but missed one or more visits at the recommended time periods for care.

(iii) Those who had 4 or more visits and had visits falling within all the four recommended time periods for focused antenatal care visits.

Those who had less than 4 visits were not considered in the analysis of measures of association. The focus was on those who had four or more antenatal visits. Group ii were therefore classified as not adherent to the timing of focused antenatal care whiles group iii were categorized as adherent to the timing of focused antenatal care.

3.13 Quality control

To ensure data quality and assure validity and reliability of the information obtained, three research assistants were trained over a 2 day period before pretesting of the questionnaire was carried out. This was to ensure that the research assistants understood the objectives of the study and the data collecting process and also to ensure that the data collection and entry was standardized. Meetings were held every day after collection of data from the postnatal clinic using the administered questionnaires to identify challenges and solutions were offered by the team.

3.14 Pretesting of questionnaire

The questionnaire was pre-tested at the La General Hospital located in the La Dadekotopon Municipality which adjoins the Accra Metropolitan area. The La General Hospital serves a population with similar socio-demographic characteristics as Ridge Hospital Accra and the Achimota Hospital. After the pretesting the questionnaire was modified based on the feedback received.

3.15 Ethical clearance

Ethical clearance was obtained from the Ghana Health Service Ethical Review Committee since the Ridge, Achimota Hospital and Maamobi Hospitals are Ghana Health Service facilities. Permission was obtained from the Accra Regional Health Directorate and from the management of the various hospitals. Approval for permission to interview postpartum mothers on focused antenatal care and also to extract data from maternal health records books as well as delivery notes was obtained.

3.16 Potential risks/benefits of the study

Participants were not harmed in anyway by the study. The possibility of having participants' medical history revealed to other people was obviated by the use of ID numbers instead of participants' names. There was no direct benefit to the study participants.The benefits to be derived from the study are that it will generate data to improve the quality of focused antenatal care in Ghana.

3.17 Consenting and assenting process

Permission was obtained from respondents who met the inclusion criteria and a written informed consent was obtained from each respondent for those 18years and above. For respondents below 18 years, written consent from parents/guardians (loco parentis) was sought, before obtaining assent from each respondent. Before the consent, the objective and the rationale of the study was explained to each of the respondents.

3.18 Privacy and confidentiality

Participants' names were not indicated on the questionnaires to ensure confidentiality. Each questionnaire therefore had a unique identification number. Patients' privacy was ensured as sensitive issues like previous induced abortions and whether previous pregnancy was

planned. The interview was therefore carried out in a consulting room away from the hearing or viewing of other people. To ensure that this information was confidential questionnaires were coded and information on computers were password protected and also study materials were kept in locked cabinets.

3.19 Data storage/security and usage

All materials related to the study were stored in a locked cabinet accessible to only the principal investigator and the research assistants. All study files on the computer were password protected. Data collected will be only be submitted in partial fulfilment of the award of a master's in public health and be presented at Scientific gatherings and also be submitted for publication in a peer reviewed journal.

3.20 Voluntary withdrawal

Participation in this study was voluntary and respondents could choose not to answer any individual question or all the questions. They were however implored to answer all questions so as to provide enough data to help improve the quality of focused antenatal care. They could withdraw from the study at any time and this in no way could affect the quality of care given to them at the clinic.

3.21 Compensation to study participants

There was no compensation paid to the study participants.

3.22 Conflict of interest

There was no conflict of interest so far as this study was concerned.

3.23 Funding of study

The study was funded by the principal investigator.

CHAPTER FOUR

RESULTS

4.0 Introduction

Out of the estimated 462 postpartum mothers who had focused antenatal care within the period of study, scheduled to be interviewed to account for incomplete and inconsistent data, we were able to interview and abstract data from 446. (Sample size was 385 clients). Sixty-eight(15.2%) of the respondents had less than 4 antenatal visits, 277(62.1%) had 4 or more visits but did not adhere to the timing of focused antenatal care visits while 101(22.6%) of the total respondents had 4 or more focused antenatal visits and adhered to the recommended timing of focused antenatal care visits. Out of the total of 378 respondents who had four or more focused antenatal visits, 101(26.7%) had adherence to the timing of focused antenatal care.

4.1 Socio-demographic characteristics of post-partum women who received focused antenatal care in the Accra Metropolitan Area in 2017.

The mean age of respondents was 29.0 ±5.8 years. Most, 190(42.6%) had an educational level up to Junior High School. Majority, 104 (76.7%) of the respondents were age 25years and above. Two hundred and sixty eight (60.1%) of the respondents were married. Majority, 376(93.5%) of the respondents were employed. Most, 337 (75.6%) of the respondents were Christians. The rest 109(24.4%) were Moslems. (Table 1).

Table 1: Sociodemographic characteristics of post -partum women who received focused antenatal care in the Accra Metropolitan Area in 2017.

Variable	Frequency(N=446)	Percentages (%)
Age group		
<25	104	23.3
25+	342	76.7
Educational level		
No formal education	51	11.4
Primary	53	11.9
JHS	190	42.6
SHS	96	21.5
Tertiary	56	12.6
Respondents Occupation		
Unemployed	70	15.7
Employed	376	84.3
Partner's occupation		
Unemployed	29	6.5
Employed	417	93.5
Marital status		
Single	69	15.5
Cohabiting	109	24.4
Married	268	60.1
Religion		
Muslim	109	24.4
Christian	337	75.6
Ethnicity		
Akan	164	36.8
Ewe	72	16.1
Ga/Dangbe	89	20.0
Others***	121	27.1

*Other Ethnic groups included Guan, Hausa, Grusi, Dagomba, Frafra, Mossi, Fulani

4.2 Obstetric and gynaecological characteristics of post-partum women who received focused antenatal care in the Accra Metropolitan Area in 2017.

One hundred and sixty eight (38%) of the respondents were para 1 whiles 228(51.1 %) were para 2 and para 3. The median parity was 2 with a minimum of 1 and a maximum of 8.

Majority, 435 (97.5%) of the respondents had no history of still birth. Seventy two percent of respondents have a history of abortion. Forty-one (26%) of the respondents had their previous pregnancies planned whiles 229(51.3%) had planned their current delivery.

Two hundred and eighty three (63.5%) of the respondents had their previous delivery in a health facility whiles 28(6.3%) of them had their previous deliveries with Traditional birth attendants or at home. One hundred and thirty five (30.3%) of the respondents had no history of a previous delivery (Table 2)

Table 2: Obstetric and Gynaecological characteristics of post -partum women who received focused antenatal care in the Accra Metropolitan Area in 2017.

Variable	Frequency(N=446)	Percentage
Parity		
1	168	37.7
2-3	228	51.1
4+	50	11.2
History of stillbirth		
No	435	97.5
Yes	11	2.5
History of abortion		
No	321	72
Yes	125	28
Pregnancy before current delivery		
Unplanned	183	41
Planned	117	26
Not applicable	146	32
Outcome of prev. pregnancy		
Live birth	273	61.2
Still birth/abortion	18	4.0
No previous pregnancy	155	34.8

Table 2: Obstetric and Gynaecological characteristics of post -partum women who received focused antenatal care in the Accra Metropolitan Area in 2017 (Continued)

Variable	Frequency(N=446)	Percentage
Satisfaction with care during prev. ANC		
Very satisfied	269	60.3
Moderately satisfied/not satisfied	33	7.4
No previous antenatal history	144	32.3
Satisfaction with care during prev. delivery		
Very satisfied	268	60.1
Moderately satisfied/not satisfied	25	5.6
No previous antenatal history	153	34.3
Adequate help in taking care of prev. baby at home		
Yes	274	61.4
No	18	4.0
Not applicable	154	34.5
Place of delivery in prev. pregnancy		
Health facility	283	63.5
Non health facility	28	6.3
Not applicable	135	30.3
Current pregnancy		
Planned	229	51.3
Unplanned	217	48.7

4.3 Fetal outcomes of post-partum women who received focused antenatal care in the Accra Metropolitan Area in 2017.

The mean birth weight from this study was 3.155 ±0.507kg. Only 40(9.0%) of the respondents had low birth weight babies (Birth weight less than 2.5). Majority, 442 (99.1%) of the respondents had live births in their current delivery. Three hundred and sixty one (80.9%) of the respondents had babies with Apgar score at one minute greater than or equal to 7, whilst 432(96.9%) had Apgar score at 5 minutes greater than or equal to 7(Table 3).

Table 3: Fetal outcomes of post -partum women who received focused antenatal care in the Accra Metropolitan Area in 2017.

Variable	Frequency(N=446)	Percentages (%)
Birth weight(kg)		
<2.5	40	9.0
2.5+	406	91.0
Outcome of delivery		
Live birth	442	99.1
Stillbirth	4	0.9
Neonatal Apgar score at 1 minute		
Less than 7	85	19.1
≥7	361	80.9
Neonatal Apgar score at 5 minute		
Less than 7	14	3.1
≥7	432	96.9
Admission to NICU		
No	432	96.9
Yes	14	3.1

4.4 Adherence to recommended timing of focused antenatal care amongst post-partum women in the Accra Metropolitan Area

In all, 429(96.2%) of respondents had at least one recommended focused antenatal visit timing correct. Three hundred and ninety-one (87.7%) had at least two visits correctly timed, 293(65.7%) had at least three visits correctly timed whiles 101(22.6%) had at least all four visits correctly timed. 327(73.5%) of respondents knew that the first antenatal visit should be less than 16 weeks. 178(39.9%) of respondents reported for their booking visit at gestational age less than 16 weeks. (Figure 2).

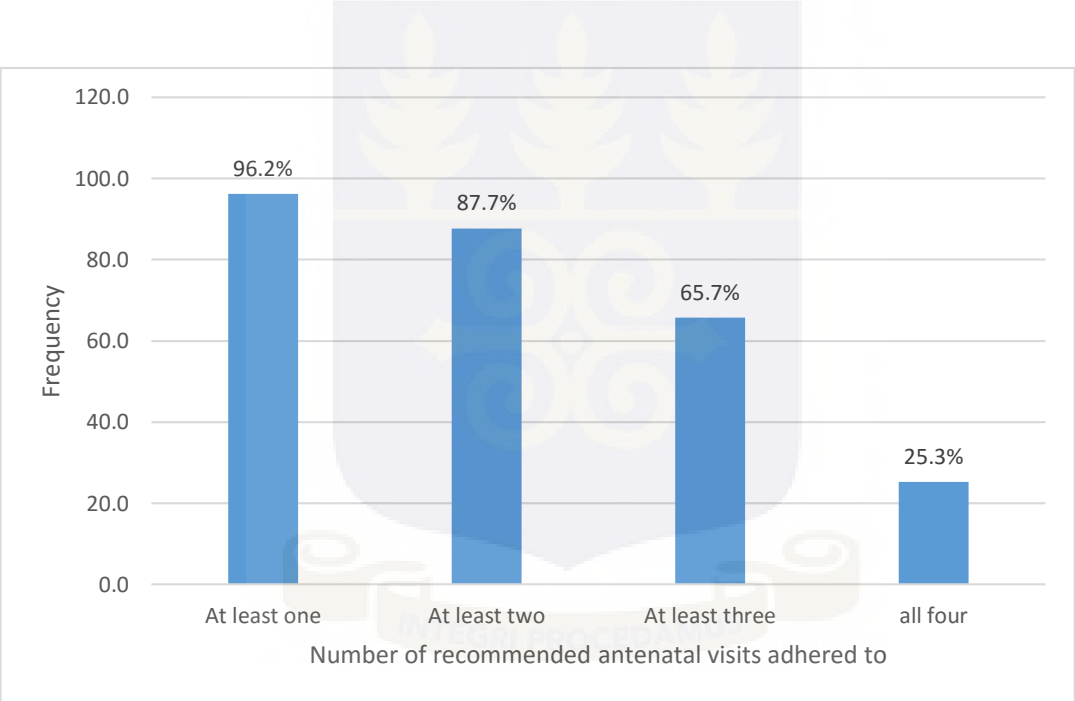

Figure 4: Adherence to recommended timing of focused antenatal care amongst post-partum women in the Accra Metropolitan Area in 2017

4.5 Adherence to recommended timing of focused antenatal care amongst post-partum women who had four or more antenatal visits in the Accra Metropolitan Area

Out of the 378(84.8%) of study participants who had four or more visits, 369(97.6%) had at least one visit at the recommended time, 352(93.1%) had at least two visits at the

recommended time, 372(72.0%) had at least 3 visits at the recommended times and 101 (26.7%) attended at least four of those visits at the recommended focused antenatal attendance times.(Figure 3).

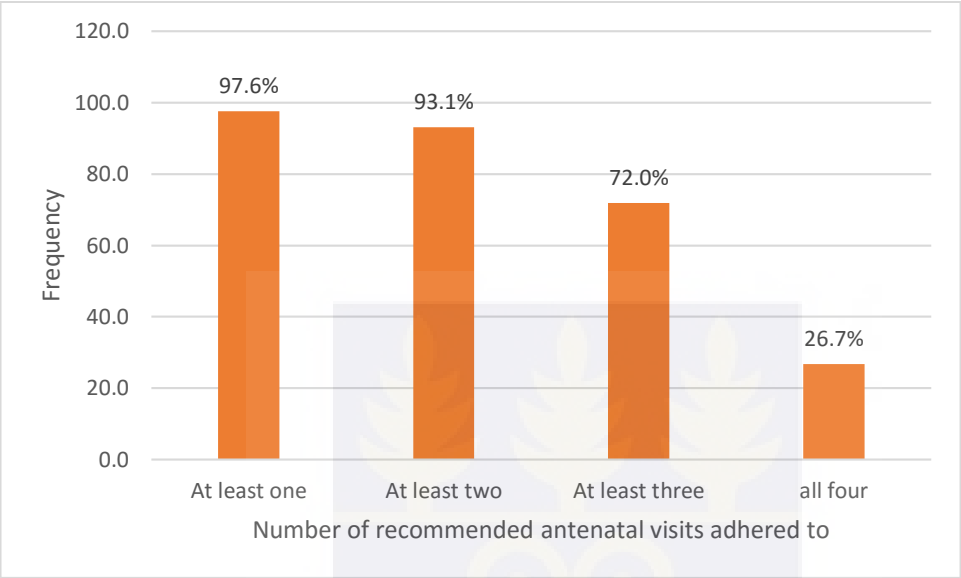

Figure 5: Adherence to recommended timing of focused antenatal care amongst post-partum women who received four or more antenatal visits in the Accra Metropolitan Area.

4.6 Association between socio-demographic characteristics of respondents and adherence to recommended timing of focused antenatal care among postpartum women who had four or more antenatal visits.

Among postpartum women who had four or more visits, there were no significant differences between the sociodemographic characteristics of those who adhered to the recommended timing of focused antenatal care and those who did not, (Table 4).

Table 4: Socio-demographic characteristics of women who attended 4 or more focused antenatal visits in the Accra Metropolitan Area by adherence to timing of visits.

Variable	No N=277	Yes N=101	Total N=378	Chi-squared/ Fisher's Value	P-value
Age	29.2 ±6.1	29.5 ±5.2	29.3 ±5.9	0.371	0.711**
Age group				0.374	0.541
<25 years	63 (75.9)	20 (24.1)	83 (100.0)		
≥25 years	214 (72.5)	81 (27.5)	295 (100.0)		
Educational level				2.113	0.715
No formal education	37 (80.4)	9 (19.6)	46 (100)		
Primary	29 (70.7)	12 (29.3)	41 (100)		
JHS	114 (72.6)	43 (27.4)	157 (100)		
SHS	65 (74.7)	22 (25.3)	87 (100)		
Tertiary	32 (68.1)	15 (31.9)	56 (100)		
Respondents Occupation				0.099	0.870
Unemployed	42 (75.0)	14 (250)	56 (100)		
Employed	235 (73.0)	87 (27.0)	322 (100)		
Partner's occupation				0.190	0.803
Unemployed	17 (77.3)	5 (22.7)	22 (100)		
Employed	260 (73.0)	96 (27.0)	378 (100)		
Marital status				1.088	0.591
Single	43 (78.2)	12 (21.8)	55 (100)		
Cohabiting	69 (70.4)	29 (29.6)	98 (100)		
Married	165 (73.3)	60 (26.7)	225 (100)		
Religion				0.148	0.787
Muslim	66 (71.7)	26 (28.3)	92 (100)		
Christian	211 (73.8)	75 (26.2)	286 (100)		
Ethnicity				0.910	0.833
Akan	108 (74.0)	38 (26.0)	164 (100)		
Ewe	41 (68.3)	19 (31.7)	72 (100)		
Ga/Dangbe	57 (74.0)	20 (26.0)	89 (100)		
Others	71 (74.7)	24 (25.3)	121 (100)		

***Student's T-test*

4.7 Association between past obstetric and gynaecological characteristics of respondents who had four or more focused antenatal visits and adherence to timing visits.

Among respondents who had 4 or more visits, a history of previous abortion was significantly associated with antenatal visits at the recommended times ($\chi 2$=14.724, p<0.001). An earlier gestational age at booking was associated significantly with adherence to recommended timing of focused antenatal care. (t test=16.388, p<0.001) (Table 5).

Table 5: Past obstetric and gynaecological history of post-partum women who attended four or more focused antenatal care in the Accra Metropolitan Area by recommended timing of visits

Variable	No N=277	Yes N=101	Total N=378	Chi-squared/ Fisher's Value	P-value
Parity	2 (1-3)	2 (1-3)	2 (1-3)		0.281#
Parity				2.421	0.303
1	111 (77.6)	32 (22.4)	143 (100)		
2-3	133 (70)	57 (30.0)	190 (100)		
4+	33 (73.3)	12 (26.7)	45 (100)		
History of stillbirth				2.601	0.197*
No	270 (72.8)	101 (27.2)	371 (100)		
Yes	7 (100.0)	0 (0.0)	7 (100)		
History of abortion				14.724	**<0.001**
No	210 (78.9)	56 (21.1)	266 (100)		
Yes	67 (59.8)	45 (40.2)	112 (100)		

Table 6: Past obstetric and gynaecological history of post-partum women who attended four or more focused antenatal care in the Accra Metropolitan Area by recommended timing of visits(*continued*)

Variable	No N=277	Yes N=101	Total N=378	Chi-squared/ Fisher's Value	P-value
Pregnancy before current delivery				3.219	0.208
Unplanned	107 (68.6)	49 (31.4)	156 (100)		
Planned	82 (78.1)	23 (21.9)	105 (100)		
Not applicable	88 (75.2)	29 (24.8)	117 (100)		
Outcome of prev. pregnancy				0.331	0.871
Live birth	170 (72.3)	65 (27.7)	235 (100)		
Still birth/abortion	11 (73.3)	4 (26.7)	15 (100)		
No previous pregnancy	96 (75.0)	32 (25.0)	128 (100)		
Satisfaction with care during prev. ANC				1.356	0.517
Very satisfied	171 (73.7)	61 (26.3)	232 (100)		
Moderately satisfied/not satisfied	18 (64.3)	10 (35.7)	28 (100)		
No previous antenatal history	88 (74.6)	30 (25.4)	118 (100)		
Satisfaction with care during prev. delivery				0.341	0.852
Very satisfied	166 (72.2)	64 (27.8)	230 (100)		
Moderately satisfied/not satisfied	16 (76.2)	5 (23.8)	21 (100)		
No previous antenatal history	95 (74.8)	32 (25.2)	127 (100)		
Adequate help in taking care of prev. baby				1.062	0.582
Yes	173 (73.3)	63 (26.7)	236 (100)		
No	10 (62.5)	6 (37.5)	16 (100)		
Not applicable	94 (74.6)	32 (25.4)	126 (100)		
Place of delivery in prev. pregnancy				0.022	1.000
Health facility	179 (73.4)	65 (26.6)	244 (100)		
Non health facility	18 (72.0)	7 (28.0)	25 (100)		
Not applicable	80 (73.4)	29 (26.6)	109 (100)		
Current pregnancy				0.000	1.000
Planned	140 (73.3)	51 (26.7)	191 (100)		
Unplanned	137 (73.3)	50 (26.7)	187 (100)		
Gestational age in wks @ booking	19.0 ±6.1	11.2 ±2.9	16.8 ±6.4	16.388	**<0.001****

Fishers exact test, **Student's T-test, #Mann-Whitney test

4.8 Association between socio-demographic characteristics and past obstetric and gynaecological history and recommended timing of visits among respondents who had four or more focused antenatal visits

Binary logistic regression showed that the odds of correct timing of focused antenatal care in women with a history of abortion was 2.5 times that of those without a history. [(COR=2.52, 95% (1.56-4.07)]. For every one week increase in gestational age at booking respondents were 30 percent less likely to complete all four antenatal visits at the recommended times. [(COR=0.70 , 95% (0.65-0.76)].

After adjusting for various possible confounders, the odds of correct timing of focused antenatal care in women who had completed Junior High School was 3.3 times that of those without any formal education. [(AOR=3.31, 95% (1.03-10.61)] whilst those who had completed Senior High School had an odds of 4.5 times that of those without formal education for adherence to the recommended timing of focused antenatal care. [(AOR=4.47, 95% (1.14-17.51)]. Women with a history of abortion were 3.7 times that of those without a history. [(AOR=3.66, 95% (1.69-7.96)]. For every one week increase in gestational age at booking respondents were 34 percent less likely to complete all four antenatal visits at the recommended times. [(AOR=0.66,95% (0.60-0.73)]. (Table 6).

Table 7: Logistic regression model for correct timing of four or more focused antenatal visits among postpartum women in the Accra Metropolitan Area

Variable	Crude OR (95% C.I)	P-value	Adjusted OR (95% C.I)	P-value
Age group				
<25 years	1		1	
≥25 years	1.19 (0.68-2.10)		1.24 (0.48-3.22)	0.658
Educational level				
No formal education	1		1	
Primary	1.70 (0.63-4.59)	0.294	3.57 (0.91-14.08)	0.069
JHS	1.55 (0.69-3.48)	0.288	3.31 (1.03-10.61)	**0.044**
SHS	1.39 (0.58-3.34)	0.459	4.47 (1.14-17.51)	**0.031**
Tertiary	1.93 (0.74-4.99)	0.177	3.06 (0.71-13.14)	0.132
Respondents Occupation				
Unemployed	1		1	
Employed	1.11 (0.57-2.13)	0.753	1.95 (0.67-5.72)	0.221
Partner's occupation				
Unemployed	1		1	
Employed	1.25 (0.45-3.50)	0.663	1.65 (0.35-7.83)	0.529
Marital status				
Single	1		1	
Cohabiting	1.50 (0.70-3.26)	0.299	2.16 (0.67-7.00)	0.200
Married	1.30 (0.64-2.64)	0.462	1.52 (0.50-4.63)	0.459
Religion				
Muslim	1		1	
Christian	0.90 (0.53-1.53)	0.701	0.38 (0.13-1.08)	0.069
Ethnicity				
Akan	1		1	0.283
Ewe	1.31 (0.68-2.54)	0.412	2.15 (0.80-5.81)	0.130
Ga/Dangbe	0.10 (0.53-1.87)	0.993	0.67 (0.25-1.83)	0.436
Others	0.96 (0.53-1.73)	0.894	0.99 (0.33-3.00)	0.987
Parity				
1	1		1	0.209
2-3	1.49 (0.90-2.45)	0.121	2.13 (0.69-6.62)	0.190
4+	1.26 (0.59-2.72)	0.554	4.11 (0.85-19.82)	0.078
History of stillbirth				
No	1		1	
Yes	0 (0-0)	0.999	0.00 (0-0)	0.999
History of abortion				
No	1		1	
Yes	2.52 (1.56-4.07)	**<0.001**	3.66 (1.69-7.96)	**0.001**

Table 6: Logistic regression model for correct timing of four or more focused antenatal visits among postpartum women in the Accra Metropolitan Area *(continued)*

Variable	Crude OR (95% C.I)	P-value	Adjusted OR (95% C.I)	P-value
Pregnancy before current delivery				
Unplanned	1		1	0.637
Planned	0.61 (0.35-1.09)	0.093	0.66 (0.27-1.60)	0.358
No previous pregnancy	0.72 (0.42-1.23)	0.231	0.66 (0.06-7.54)	0.738
Outcome of prev. pregnancy				
Live birth	1		1	0.591
Still birth/abortion	0.95 (2.9-3.09)	0.934	0.28 (0.02-3.77)	0.337
No previous pregnancy	0.87 (0.53-1.43)	0.584	1.06 (0.21-5.28)	0.943
Satisfaction with care during prev. ANC				
Very satisfied	1		1	0.428
Moderately satisfied/not satisfied	1.56 (0.68-3.56)	0.239	2.25 (0.35-14.42)	0.392
No previous antenatal history	0.96 (0.58-1.59)	0.861	6.92 (0.29-162.68)	0.230
Satisfaction with care during prev. delivery				
Very satisfied	1		1	0.777
Moderately satisfied/not satisfied	0.81 (0.29-2.30)		0.60 (0.06-5.63)	0.656
No previous antenatal history	0.87 (0.53-1.43)		0.37 (0.02-8.66)	0.533
Adequate help in taking care of prev. baby				
Yes	1		1	0.985
No	1.65 (0.58-4.72)	0.352	1.17 (0.17-8.05)	0.875
No previous pregnancy	0.94 (0.57-1.53)	0.789	1.14 (0.11-12.31)	0.917
Place of delivery in prev. pregnancy				
Health facility	1		1	0.983
Non health facility	1.07 (0.43-2.68)	0.884	1.12 (0.15-8.34)	0.913
No previous pregnancy	0.94 (0.60-1.66)	0.995	0.93 (0.09-9.44)	0.952
Current pregnancy				
Planned	1		1	
Unplanned	1.00 (0.64-1.58)	0.994	0.86 (0.40-1.83)	0.691
Gestational age in wks @ booking	0.70 (0.65-0.76)	**<0.001**	0.66 (0.60-0.73)	**<0.001**

4.9 Association between respondents who had four or more focused antenatal visits socio-demographic characteristics and past obstetric and gynaecological history and birth weights

There were no significant associations between birth weight and selected sociodemographic and past obstetric and gynaecological characteristics of respondents.(Table 7).

Table 8: Logistic regression model for birth weight among post-partum women who attended four or more focused antenatal visits in the Accra Metropolitan Area

Variable	Crude OR (95% C.I)	P-value	Adjusted OR (95% C.I)	P-value
Age group				
<25 years	1		1	
≥25 years	1.67 (0.73-3.83)		1.26 (0.47-3.36)	0.647
Educational level				
No formal education	1		1	
Primary	0.57 (0.09-3.62)	0.557	0.74 (0.11-4.93)	0.757
JHS	0.67 (0.14-3.16)	0.611	0.91 (0.18-4.58)	0.908
SHS	0.45 (0.09-2.21)	0.324	0.72 (0.13-3.86)	0.699
Tertiary	0.31 (0.06-1.62)	0.166	0.47 (0.08-2.77)	0.404

Table 9: Logistic regression model for birth weight among post-partum women who attended four or more focused antenatal visits in the Accra Metropolitan Area (*continued*)

Variable	Crude OR (95% C.I)	P-value	Adjusted OR (95% C.I)	P-value
Respondents Occupation				
Unemployed	1		1	
Employed	2.39 (1.00-5.69)	0.050	1.92 (0.73-5.07)	0.190
Partner's occupation				
Unemployed	1		1	
Employed	2.00 (0.56-7.21)	0.288	1.28 (0.31-5.29)	0.735
Marital status				
Single	1		1	
Cohabiting	1.64 (0.56-4.80)	0.366	1.26 (0.39-4.08)	0.699
Married	2.20 (0.84-5.74)	0.108	1.63 (0.54-4.99)	0.388
Parity				
1	1		1	
2-3	1.74 (0.79-3.84)	0.171	0.46 (0.15-1.43)	0.178
4+	2.52 (0.55-11.47)	0.232		
Current pregnancy			1	
Unplanned	1		1.36 (0.58-3.20)	0.478
Planned	0.91 (0.43-1.94)	0.801	1.41 (0.27-7.26)	0.680
All four visits				
No	1		1	
Yes	1.16 (0.48-2.80)	0.744	0.82 (0.37-1.83)	0.624

4.10 Association between socio-demographic characteristics and past obstetric and gynaecological history and Apgar score at one minute among respondents who had four or more focused antenatal visits

Binary logistic regression showed that among women who had more than 4 focused antenatal visits, those who were 25 years or more were 48 percent less likely to have a one minute Apgar scores of 7. This was however not a significant finding. [(COR=0.52, 95% (0.25-1.06)].

After adjusting for possible confounders, those who had four or more visits and whose ages were 25 years or more were 54 percent less likely to have fetal Apgar scores of 7 or more. This was a significant finding. [(AOR=0.46, 95% (0.22-0.97)].(Table 8).

Table 10: Logistic regression model for Apgar score at one minute among babies born to post-partum women who attended four or more focused antenatal visits in the Accra Metropolitan Area in 2017.

Variable	Crude OR (95% C.I)	P-value	Adjusted OR (95% C.I)	P-value
Age group				
<25 years	1		**1**	
≥25 years	0.52 (0.25-1.06)	0.070	0.46 (0.22-0.97)	**0.042**
Educational level				
No formal education	1		1	
Primary	0.86 (0.32-2.34)	0.769	0.89 (0.32-2.47)	0.817
JHS	1.62 (0.71-3.71)	0.255	1.64 (0.70-3.84)	0.255
SHS	1.23 (0.51-2.99)	0.644	1.32 (0.53-3.33)	0.554
Tertiary	0.73 (0.28-1.88)	0.509	0.91 (0.33-2.47)	0.846
Parity				
P1	1		1	
P2-P3	1.60 (0.92-2.78)	0.094	1.65 (0.93-2.95)	0.090
P4+	1.20 (0.53-2.75)	0.666	1.40 (0.57-3.41)	0.460
Birth weight				
<2.5	1		1	
2.5+	2.04 (0.89-4.70)	0.093	2.05 (0.87-4.84)	0.103
All 4 visits				
No	1		1	
Yes	1.22 (0.67-2.23)	0.508	1.19 (0.64-2.20)	0.579

4.11 Association between socio-demographic characteristics and past obstetric and gynaecological history and Apgar score at five minutes among respondents who had four or more focused antenatal visits

There was no significant association between selected socio-demographic characteristics and past obstetrics and gynaecological history and Apgar score at 5 minutes among respondents who had four or more focused antenatal visits. (Table 9).

Table 11: Logistic regression model for Apgar Score at 5 minutes for focused antenatal care attendants who had four or more visits in the Accra Metropolitan Area in 2017

Variable	Crude OR (95% C.I)	P-value	Adjusted OR (95% C.I)	P-value
Age group				
<25 years	1		**1**	
≥25 years	0 (0-0)	0.997	0.00 (0.00-0.00)	0.997
Educational level				
No formal education	1		1	
Primary	0.89 (0.05-14.68)	0.934	0.90 (0.05-15.52)	0.944
JHS	0.85 (0.09-7.79)	0.886	0.66 (0.07-6.50)	0.722
SHS	35899441.44 (0-0)	0.997	24196638.31 (0.00-0.00)	0.997
Tertiary	0.33 (0.033-3.25)	0.340	0.32 (0.03-3.82)	0.364
Parity				
P1	1		1	
P2-P3	1.79 (0.39-8.14)	0.449	2.39 (0.50-11.48)	0.278
P4+	1.20 (0.11-3.50)	0.587	0.82 (0.12-5.60)	0.839
Birth weight				
<2.5	1		1	
2.5+	0 (0-0)	0.998	0.00 (0.00-0.00)	0.998
All 4 visits				
No	1		1	
Yes	0.45 (0.11-1.69)	0.236	0.48 (0.12-1.89)	0.293

4.12 Association between selected respondents' socio-demographic characteristics and past obstetric and gynaecological history among women who had four or more focused antenatal visits and admission of their babies to NICU.

There were no significant associations between selected respondents' socio-demographic characteristics and past obstetric and gynaecological history and admission of their babies to NICU. (Table 10).

Table 12: Logistic regression model for admission to NICU among babies born to post-partum women who attended four or more focused antenatal care in the Accra Metropolitan Area in 2017

Variable	Crude OR (95% C.I)	P-value	Adjusted OR (95% C.I)	P-value
Age group				
<25 years	**1**		**1**	
≥25 years	1.27 (0.27-6.02)	0.759	1.61 (0.32-8.14)	0.568
Educational level				
No formal education	1		1	
Primary	0 (0-0)	0.998	0 (0-0)	0.998
JHS	1.48 (0.17-13.0)	0.723	1.38 (0.15-12.56)	0.777
SHS	1.61 (0.16-15.9)	0.685	1.35 (0.13-14.24)	0.804
Tertiary	2.0 (0.18-22.8)	0.577	1.43 (0.11-18.25)	0.784
Parity				
1	1		1	
2-3	0.49 (0.14-1.77)	0.278	0.50 (0.13-1.94)	0.317
4+	0.52 (0.06-4.43)	0.549	0.55 (0.06-5.30)	0.603
Birth weight				
<2.5	1		1	
2.5+	0.36 (0.07-1.74)	0.202	0.44 (0.09-2.25)	0.323
All 4 visits				
No	1		1	
Yes	0.60 (0.13-2.83)	0.520	0.65 (0.13-3.11)	0.586

4.13 Association between selected respondents' socio-demographic characteristics and past obstetric and gynaecological history among women who had four or more focused antenatal visits and occurrence of still birth.

There was a single postpartum woman who had a still birth among those who had four or more antenatal visits. Hence the association between adherence to timing of focused antenatal care and still births could not be determined in this study.

CHAPTER FIVE

DISCUSSIONS

5.0 Timing of focused antenatal care

This study found that close to 40 percent of the respondents had their first antenatal visit less than 16 weeks. This is less than that recorded in the GDHS 2014 which was 64 percent. The reason for this could be the fact that Accra being a metropolitan area may have more women engaged in formal employment who may not be able to easily take time off work to start antenatal care especially when they do not have problems in early pregnancy. This relatively late reporting for the first antenatal visit is detrimental and may lead to incomplete focused antenatal intervention schedule. (Agha & Tappis, 2016). Late reporting for the booking antenatal visit has also been associated with women who do not receive adequate education on danger signs of pregnancy. This figure is however higher than the 25 percent of pregnant women in Uganda whose booking visit occurred before 16weeks (Ugandan Bureau of Statistics, 2011). This difference may be attributed to the differences in socio-demographic characteristics between Ghana and Uganda.

The 40 percent respondents who had their booking visit before 16 weeks is better than the 64 percent of antenatal women who present for their booking visit in the third trimester that was recorded in Kenya. (Eijk et al., 2006). The Kenyan study was however a rural community and also a community survey where access to patients antenatal records may be a challenge.

The proportion of women attending focused antenatal care in the Accra Metropolitan area and having four or more visits was about 85 percent. This is close to the 87 percent national figure of Ghanaian pregnant women who have four or more antenatal visits (Ghana Statistical Service (GSS), Ghana Health Service (GHS), & ICF Macro International, 2014) and the 87% reported in Vietnam (Tran et al., 2012) but higher than the 48 percent recorded

in Uganda((Ugandan Bureau of Statistics, 2011) However only 22.6 percent of women receiving focused antenatal care in the Accra Metropolis had at least these four visits in the recommended focused antenatal times. From this study, out of the women who had four or more antenatal visits 27 percent of them had at least four visits occurring within the recommended times for focused antenatal care. This observation may probably be because even though some antenatal centres are designated as focused antenatal care centres, they may be doing more than four visits may have a timing schedule that may not coincide with the recommended focused antenatal schedule. This may have an impact on the effectiveness of various interventions provided during various visits because the interventions in focused antenatal care are hinged to specific gestational ages to allow for effective remedies to be provided to women.

The average gestational age at booking from this study which was about 17 weeks. It is better than that recorded in North Central Nigeria of 19 weeks (Ifenne & Utoo, 2012). The reasons for this difference however is not clear. It is also better than the gestational age at booking of 20 weeks recorded in Eastern Tanzania. (Gross, Alba, Glass, Schellenberg, & Obrist, 2012). This difference may be attributable to the fact that the latter study was carried out in a rural district where the socio-demographic characteristics of the respondents are likely to be different from this study which was undertaken in the Accra Metropolis. This rural urban difference also agrees with work done in Pakistan where urban women were found to initiate antenatal care early compared to those in rural areas. (Agha & Tappis, 2016).

5.1 Determinants of adherence to focused antenatal care

From this study, the most significant determinants of adherence to the recommended timing of all four focused antenatal visits were women whose level of education was up to either

junior or senior high school, a previous history of abortion and early initiation of antenatal care. With reference to education as a determinant for adherence to timing of focused antenatal care among women with four or more antenatal visits, the most significant determinant was women whose educational background was the Senior High School Level (p=0.031). This result agrees with work done in Pakistan which showed that women with secondary education had an odds of 5 that of those without formal education for adherence to the timing of focused antenatal care. (Mumtaz & Salway, 2007) The likely explanation for this trend is that women with tertiary education are likely to be engaged in formal jobs which may not enable them to attend antenatal care at the prescribed periods. Women with secondary education are likely to be involved in informal jobs and therefore may be able to easily make time to attend focused antenatal care. Women with a previous history of abortion are likely to have all four recommended focused antenatal visit timing right because they may want to prevent any mishap from happening in the index pregnancy. This assertion holds for women who had previous spontaneous abortions in the past. Even though a further question requested for whether these abortions were spontaneous or induced as well as the number of times, these were not mutually exclusive and therefore made it difficult to tell whether the effect of abortions on correct timing of antenatal care was due predominantly to those that were spontaneous or induced. These findings agree with that of (Gross et al., 2012) where poor outcomes of such as miscarriage or stillbirth in previous pregnancies were found to be associated with early initiation of antenatal care. Women who report early for booking visit were more likely to have the recommended first focused antenatal visit correct. They are therefore likely to have all four recommended timing of antenatal visits correct compared to those who initiate antenatal care late.

Even though other studies (Manzi et al., 2014) have reported late reporting for the first antenatal care in para 4 or more compared to para 1, this study focussed on the effect of

parity not on the booking visit but on the recommended timing of antenatal visits among those who had four or more visits. The study found out that the odds of attending at least all four antenatal visits at the recommended times in para 4 or more was 4 that of primiparous women. This was however not statistically significant. (p=0.078). The reason for this may probably be because the women with parity of 4 or more may have attended antenatal care for each pregnancy making them more knowledgeable about the timing of focused antenatal care compared the women who had just delivered their first children.

This study also found that within the subgroup of women who had 4 or more antenatal visits, the odds of attending all four antenatal visits at the recommended times among women who were employed was twice that of those who were not employed however this was not statistically significant.(p=0.221). Previous studies had established a link between employment status of women and adherence to timing of first antenatal visit. In Ghana, women who are employed are more likely to adhere to antenatal care guidelines compared to the unemployed. (Amoakoh- Coleman M, Agyepong AI, Kayode GK, Grobbee ED, Klipstein-Grobusch K, 2016). In Pakistan too, gainfully employed women have been found to be more likely to adhere to timing of focused antenatal care.(Mumtaz & Salway, 2007). This study did not record this finding as significant probably because of the limited number of health facilities used. There may be the need to carry out this study on a wider scale that may include many more centres.

Again from this study, among women who had four or more visits, those who were moderately or less satisfied with the care given to them in their previous delivery had an odds of twice that of those who were satisfied for observing the recommended timing of focused antenatal care. This finding was however not significant. Other studies had showed that poor healthcare provider attitude in previous antenatal experience was associated with poor adherence to timing of focused antenatal care. (Andrew et al., 2014; Gross et al., 2012).

There may be the need to examine where the previous antenatal visits during which clients were not satisfied were held and whether they had changed facilities for antenatal care to be able to understand this phenomenon. This was not looked at in this study.

Amoakoh-Coleman et al found out that an age less than 25 were more likely to initiate antenatal care early(Amoakoh-Coleman M, Agyepong AI, Kayode GK, Grobbee ED, Klipstein-Grobusch K, 2016). This study found out that among postpartum women who had four or more focused antenatal visits, those aged 25 or more had approximately an odds of 25% more than that of those less than 25 years but this was not a statistically significant finding.

With regards to planning of pregnancy as a predictor of adherence to timing of focused antenatal care, previous studies had produced conflicting results. Unplanned pregnancies in Brazil have been found to be significantly associated with adherence to timing of focused antenatal care compared to planned pregnancies. (Bassani et al., 2016). Manzi et al however found that planned pregnancies were associated with adherence to the timing of first antenatal care. (Manzi et al., 2014). From this study, women who have four or more antenatal visits with unplanned pregnancies are 14 percent less likely to adhere to the timing of focused antenatal care. This was however not a significant finding.

With regard to knowledge about recommended timing for the first antenatal attendance 73.5 percent of the respondents knew about the fact that the first antenatal visit should be at gestational age less than 16 weeks. This is similar to results obtained in Uganda. (Kisuule et al., 2013). This knowledge of the recommended timing of the first antenatal did not translate into practice as only 40 percent of the respondents actually reported for their first antenatal visit before 16weeks. This was because some of them had other issues to attend to and some felt that they were well and did not have any health issues and therefore there was

no need to report early for the booking visit. Financial constraints were also adduced by some respondents as a reason for not attending the booking visit before 16 weeks.

5.2 Outcomes of focused antenatal care

Amongst women who had four or more focused antenatal visits, those who were 25 or more years were less likely to have good fetal outcomes at one minute post-delivery. This was a significant finding (p=0.042). This is because those less than 25 years were more likely to have no or less number of children compared to those aged 25 years or more. It has been demonstrated that women with just one living child are more likely to be adherent to the timing of focused antenatal care as they feel insecure with just one child because of the possibility of losing that child through mishap such as illness or an accident. (Agha & Tappis, 2016).

This study showed that women who had all four antenatal visits at the recommended times were 18 percent less likely to have normal weight babies even though this was not statistically significant. This is at variance with the findings in other studies which show a positive influence of timeliness of antenatal care on fetal birthweight. (Servan-mori et al., 2016).

Our study findings also showed that among women who had four or more focused antenatal visits, and adhered to the correct timing of antenatal visits were 19 percent more likely to have good fetal Apgar scores at one minute compared to those who did not. This finding was however not significant (p=0.579). The association could be explained by the fact that adherence to timing of focused antenatal care enabled interventions to be carried out at times that allowed for good fetal and maternal wellbeing. Adherence to timing of focused antenatal care however did not also significantly affect the Apgar score at 5 minutes from

this study even though the results showed that those with four or more antenatal visits were 52 percent less likely to have good fetal Apgar scores at 5 minutes. The reasons for this finding are not clear.

There were no significant findings with respect to timing of focused antenatal care and admission of babies to NICU.

The effect of recommended timing of focused antenatal care among women who had four or more antenatal visits on the incidence of still birth could not be determined in this study because of the single case of still birth recorded in this subgroup.

5.3 Limitations of the study

The respondents may not have been able to accurately recollect some past obstetrics and gynaecological history such as histories of and number of abortions.

With regards to questions asked about satisfaction with care during antenatal and previous deliveries the answers obtained may have been socially desirable to possibly prevent offending the current care givers. This may be a limitation to the study.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusion

About 85 percent of women receiving focused antenatal care in the Accra Metropolitan area have four or more visits. Only 27 percent of women who had four or more antenatal visits adhered to the recommended timing. Among women who had four or more antenatal visits, early initiation of antenatal care, an educational level up to Junior or Senior High School as well as women with a history of abortion were predictors for adherence to the timing of focused antenatal care. Women whose ages were more than 25 years were less likely to have good fetal Apgar scores at 1 minute. There is the need to educate women on the recommended timing of antenatal care as the WHO introduces the new 8 visit schedule for a positive pregnancy experience.

6.2 Recommendations

1. There should be improved education of all women on the need for early initiation of antenatal care by the Public Health Division of the Ghana Health Service and Civil Society Organisations.

2. The findings of this study should inform the Ghana Statistical Service and its partners about the need to include the proportions of women with correct timing of all the four focused antenatal visits in the Ghana Demographic and Health Survey.

3. The Research and Development Division of the Ghana Health Service should periodically audit the timing of and interventions given during the current focused antenatal care schedule.

4. Women without histories of abortion or mishaps during previous pregnancies need to be targeted specifically for special attention and public education as they are more likely not to be adherent to timing of focused antenatal care. This should be done by the Public Health Division of the Ghana Health Service and Civil Society Organisations.

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APPENDICES

Appendix A: Consent Form

INFORMATION LEAFLET FOR PARTICIPANTS

RESEARCH TOPIC: ADHERENCE TO TIMING OF FOCUSED ANTENATAL CARE AND FETAL OUTCOMES IN THE ACCRA METROPOLITAN AREA.

Background information

I am a student in the School of public health, College of Health Sciences of the University of Ghana and pursuing a master's in public health. My assistants and I are carrying out a study to find out the effect of one provider to one client versus one provider to a group of clients counselling on the uptake of postpartum contraception.

We are very happy to invite you to participate in the study. We would be grateful if you could kindly read this leaflet or we will explain its contents to you so that you can decide whether to take part in the study or not.

PURPOSE OF THE STUDY

The purpose of this study is to determine the proportions of pregnant women who attend focused antenatal care at the recommended times as well as the factors that lead to adherence to the recommended timing of focused antenatal care. The study will also assess the health of babies born to mothers who attend focused antenatal care at the recommended times.

STUDY PROCEDURE, BENEFITS AND COSTS

Participation in this research will involve answering a questionnaire which will last about 10 minutes at the postpartum clinic. Information that will be required from you will include

your demographic data, obstetrics and gynaecology history (both past and current). Other information will be obtained from your clinical records.

The information will be useful in improving the current focused antenatal care services. This will help to improve the health of the mother during pregnancy and help mothers to deliver healthy babies. There are no costs involved on your part in participating in this research. The study will not affect whatsoever the kind of care you receive. In accepting to take part in this study the discomforts that you may have are mainly the time taken to answer the questions and the inconvenience in answering some of the questions which may be personal. If you decide to participate in this study, you will not have to answer every question, and you may withdraw whenever you wish.

CONFIDENTIALITY

The research team guarantee that all information obtained will be kept in the strictest confidence.

Your name and identity are not needed for the study. The information you would provide however is going to be identified by a special code number and would be treated strictly as confidential. You are assured that your name shall not appear or be mentioned in any report that may come out as a result of this study. This study has been reviewed and approved by the Ethical clearance will be sought from the Ghana Health Service Ethical Review Committee since the Ridge Hospital a Ghana Health Service facility. Permission will be sought from the Accra Regional Health Directorate and from the management of the Accra Ridge Hospital.

If you have any questions or concerns, we will be happy to address them.

You may contact the principal investigator:

1. Kwaku Asah-Opoku

Department of Obstetrics and Gynaecology,

Korle-Bu Teaching Hospital.

P.O.Box 77.

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PARTICIPANT'S CONSENT FORM

I have explained fully to the subject the nature and purpose of the study and risk involved in its performance. I have addressed to the best of my knowledge all questions related to the study.

Signature: _____ Date: _____

I _____ have read the above information/ the information has been read to me or translated to me and I have fully understood it.

My concerns have been fully addressed. My signature/thumb print below indicates that I agree to participate in the study. I fully understand what is going to be done and I agree to voluntarily take part in the study.

Signature: _____ Date: _____

Appendix B-Questionnaire

ADHERENCE TO TIMING OF FOCUSED ANTENATAL CARE AND FETAL OUTCOMES IN THE ACCRA METROPOLITAN AREA.

SOCIODEMOGRAPHIC CHARACTERISTICS

1. Date
2. ID NO .....
3. Age in years.....
4. Residence .....
5. Educational status

[0]No formal education [1] Primary [2] JSS [3] SSS [4] Tertiary (specify)

6. Occupation of respondent

[0]Student [1] Farmer [2] Unemployed [3] Salaried worker (public) [4] Salaried worker (private) [5] Trader [6] Artisan [7] Specify……..

7. Occupation of partner

[0]Student [1] Farmer [2] Unemployed [3] Salaried worker (public) [4] Salaried worker (private) [5] Trader [6] Artisan [7] Specify……

8. Marital status

[0] Married [1] Single [2] Cohabiting [3] Widowed [4] Divorced/Separated [4] Others-specify.....

9. Religion

[0]Christian [1] Moslem [2] Traditional [3] Others. Please specify …….....

10. Ethnic origin

[0] Akan [1] Ewe [2] Ga/Dangbe [3] Guan [4]Others(specify).....

OBSTETRICS AND GYNAECOLOGY HISTORY

11. Parity .....
12. Last menstrual period……

13. History of stillbirth

[0]Yes [1] No

14. If yes to question 13, how many?

[0] One [1] Two [2] Three [3] More than three

15. History of abortion

[0]Yes [1] No

16. If yes to question 15 was it

[0]Spontaneous (miscarriage) [1] Induced

17. If the answer to question 16 is spontaneous, how many times

[0] One [1] Two [2] Three [3] More than three

18. If the answer to question 16 is induced, how many times

[0] One [1] Two [2] Three [3] More than three

19. Pregnancy before current delivery

[0]Unplanned [1] Planned [2] Not applicable

20. What was the outcome of the pregnancy before the current delivery?

[0] Live Birth [1] Still birth [2] Abortion

21. If the answer to question 20 is a live birth

[0] Baby was admitted at the hospital [1] Baby was not admitted at the hospital

22. If baby was admitted at the hospital how old was the baby in weeks at the time of admission …….

23. What was the reason for admission?

[0] Baby too small [1] Baby too big [2] Baby did not cry

[3] Baby had breathing difficulties [4] Baby had some congenital anomalies

[5] Others. Please specify.....

24. Were you satisfied with the care given to you by staff during the antenatal attendance for the previous pregnancy?

[0]Very satisfied [1] Moderately satisfied [2] Not satisfied

25. Were you satisfied with the care given to you by staff at the delivery of your previous child?

[0]Very satisfied [1] Moderately satisfied [2] Not satisfied

26. Did you receive adequate help at home to take care of the baby before this current delivery?

[0] Yes [1] No [3] Not applicable

27. Place of delivery of pregnancy before the current delivery

[0] Hospital/clinic [1] Maternity home [2] Traditional birth attendant [3] Home [4] Others (Please state). [5]Not applicable

28. For the current delivery, the pregnancy was

[0]Unplanned [1] Planned

29. Birth interval between current delivery and the previous one.

..... (Months)

30. At what gestation should the first antenatal visit be undertaken?

……weeks

31. If the first antenatal visit from the abstraction form is after 16 weeks, What is the reason?

[0] I was not aware [1] I had to attend to other issues [2] I felt well

[3] I did not have money [4] others. Please specify.....

Appendix C: Data Abstraction Form

ADHERENCE TO TIMING OF FOCUSED ANTENATAL CARE AND FETAL OUTCOMES IN THE ACCRA METROPOLITAN AREA.

Timing of Antenatal care and interventions

	1st visit	2nd visit	3rd visit	4th visit	5th visit	6th visit	7th visit	8th visit	9th visit	10th visit	11th visit	12th visit
1	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date
2	GA:	GA:	GA:	GA:	GA:	GA:	GA:	GA:	GA:	GA:	GA:	GA:

3. At what gestation was the earliest ultrasound scan done.....

4. Expected date of delivery by earliest ultrasound scan.....

5. Total number of antenatal visits.....

6. Date of delivery (Gestational age at delivery).....

FETAL OUTCOMES

7. Birth weight of baby.....

8. Outcome of delivery

[0]Live birth [1] Still birth

9. Neonatal Apgar score at 1 minute.....

10. Neonatal Apgar score at 5 minutes……

11. Admission of baby to NICU

[0] Yes [1] No

12. If yes to question 11, what were the reasons for admission?

[0] Baby too small [1] Baby too big [2] Baby did not cry

[3] Baby had breathing difficulties [4] Baby had some congenital anomalies

[5] Others. Please specify.....

Appendix D: Ethical Clearance

GHANA HEALTH SERVICE ETHICS REVIEW COMMITTEE

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

My Ref. GHS RDD ERC Admin App 17462
Your Ref. No.

Research & Development Division
Ghana Health Service
P. O. Box MB 190
Accra
Tel: +233-302-681109
Fax + 233-302-685424
Email: ghserc@gmail.com

Kwaku Asah-Opoku
School of Public Health
University of Ghana
Legon-Accra

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

GHS-ERC Number	**GHS-ERC: 19/12/2016**
Project Title	Adherence to timing of focused antenatal care and fetal outcomes in the Accra Metropolitan Area
Approval Date	28th March, 2017
Expiry Date	27th March, 2018
GHS-ERC Decision	**Approved**

This approval requires the following from the Principal Investigator

- Submission of 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.

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.....
PROFESSOR MOSES AIKINS
(GHS-ERC VICE CHAIRPERSON)

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