ENSIGN COLLEGE OF PUBLIC HEALTH, KPONG, EASTERN REGION, GHANA

FACULTY OF PUBLIC HEALTH

DEPARTMENT OF COMMUNITY HEALTH

FACTORS INFLUENCING THE INTER-PREGNANCY INTERVALS OF PREGNANT WOMEN IN THREE DISTRICT HOSPITALS IN THE VOLTA REGION OF GHANA

BY

ISRAEL ABEBRESE SEFAH

JUNE, 2017

ENSIGN COLLEGE OF PUBLIC HEALTH, KPONG, EASTERN REGION,

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A THESIS SUBMITTED TO THE DEPARTMENT OF COMMUNITY HEALTH, FACULTY OF PUBLIC HEALTH, ENSIGN COLLEGE OF PUBLIC HEALTH IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE MASTER OF PUBLIC HEALTH DEGREE

JUNE, 2017

DECLARATION

I, Israel Abebrese Sefah, the author of this dissertation, do hereby declare that with the exception of references made to other literature and works of other researchers which have been duly acknowledged, the content of this dissertation is the result of my own investigation, and has not been presented for any other degree elsewhere.

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DEDICATION

This research is dedicated to my wife, Mr. Akpene Sedem Ama Sefah and my two children, David Afriyie Sefah and Charis Aseda Sefah, for their invaluable support and prayers during the two-year period of this course.

ACKNOWLEDGEMENT

I am grateful to the Almighty God for his protection and guidance throughout my studies. I am highly indebted to my supervisors, Dr. Phyllis Antwi and Dr. Frank Baiden, for their directions and counselling throughout this thesis.

Finally, I want to thank my lecturers and the entire staff of Ensign College of Public Health for their support throughout my studies.

May God richly bless you all.

DEFINITION OF TERMS

Interpregnancy Interval: It is the time interval (in months) between an index pregnancy and a previous live or non-live birth.

Short Interpregnancy Interval: A short interpregnancy interval (IPI) is defined as any pregnancy occurring before the WHO recommended IPI of 24 months after a live birth and 6 months after an abortion

Long Interpregnancy Interval: A long interpregnancy interval is any pregnancy whose birth spacing is not a short IPI

Family Planning: Family planning (FP) is the decision-making process by couples, together or individually, on the number of children that they would like to have in their lifetime, and the age interval between children.

Postpartum Family Planning: It is defined as the prevention of unintended pregnancy and closely spaced pregnancies through the first 12 months following childbirth.

ACRONYMS

FP	Family Planning
PPFP	Postpartum Family Planning
IPI	Interpregnancy Interval
GHS	Ghana Health Service
GSS	Ghana Statistical Service
MCHIP	Maternal and Child Health Integrated Program
WHO	World Health Organization
UNICEF	United Nations Children's Fund
CPR	Contraceptive Prevalence Rate
MICS	Multiple Indicator Cluster Survey
GNPP	Ghana National Population Policy
VRHD	Volta Regional Health Directorate
FHU	Family Health Unit
MCSP	The Maternal and Child Survival Program
GDHS	Ghana Demographic Health Survey

ABSTRACT

Background: The World Health Organization recommends that after a live birth, the appropriate interpregnancy interval (IPI) should be at least 24 months in order to reduce the risk of adverse maternal, perinatal, neonatal and infant health outcomes. The postpartum period offers a window of opportunity for women to be offered family planning (FP) counselling because of the likelihood of their encounter with the health system.

Method: The study used health facility-based cross-sectional design to interview pregnant women who had at least one child and were presenting to the antenatal clinics in Keta, Ketu-South and Akatsi-South Districts in the Volta Region of Ghana. It was planned to interview all attendants to the facility who consented to participation between January and February, 2017. The questionnaire was structured and developed as an adaptation of questions used in similar work in Ghana. Data was collected on respondents' socio-demographic characteristics, obstetric history including time of last previous delivery, spousal role of FP choices and intentions to adopt postpartum family planning (PPFP). Analyses using Stata version 14 were performed with IPI status (relative to the time of delivery in the previous pregnancy) as the major outcome of interest.

Results: Four hundred pregnant women were interviewed. The mean age and parity of respondents were 29 (standard deviation (SD) ±5) years and 2 (SD±1) children respectively. The mean and median IPI were 35 (SD±5) months and 28 months respectively. The prevalence of short (less than 2 years) IPI was about 40%. The independent predictors of IPI longer than two years were adoption of PPFP (aOR = 2.55, CI 1.29-5.04), current pregnancy having been planned (aOR = 4.5, CI 1.83-11.21), partner having made the decision on the adoption of PPFP

(aOR = 5.82, CI 1.77 – 19.15), being among those with middle (aOR = 2.00, 95% CI 1.03 - 3.90) and high socio-economic status (aOR = 1.26, CI 1.26-20.50) and being older than 25 years (aOR = 1.12, CI 1.02-1.22).

Conclusion: To ensure healthier choices among pregnant women on their IPI in these study areas, there is the need to design PPFP interventions that promote male partner participation.

TABLE OF CONTENTS

DECLARATION ..... **ii**

DEDICATION ..... **iii**

ACKNOWLEDGEMENT ..... **iv**

DEFINITION OF TERMS ..... **v**

ACRONYMS ..... **vi**

ABSTRACT ..... **vii**

TABLE OF CONTENTS ..... **ix**

LIST OF TABLES ..... **xiv**

LIST OF FIGURES ..... **xvi**

LIST OF MAPS ..... **xvii**

LIST OF APPENDICES ..... **xviii**

CHAPTER ONE **1**

1.0 INTRODUCTION 1

1.1 Background 1

1.2 Problem Statement 5

1.3 Justification 7

1.4 Conceptual Framework 9

1.5 Research Questions 10

1.6 General Objective 10

1.7 Specific Objectives 10

1.8 Profile of Study Area 11
1.9 Scope of Study 14
1.10 Organization of Report 14
CHAPTER TWO 15
2.0 LITERATURE REVIEW 15
2.1 Interpregnancy Interval 15
2.2 Components and Determinants of Reproductive Stages in women 17
2.3 Prevalence of Short Interpregnancy Interval 19
2.4 Determinants of Short Interpregnancy Intervals 19
2.4.1 Birth History of Respondents 19
2.4.2 Lactation 20
2.4.3 Maternal Age and Parity 21
2.4.4 Socio-economic Risk Factor 22
2.4.5 Knowledge and Attitude of Women about Contraception and Birth Spacing 23
2.5 Short Interpregnancy Intervals and Risks of Adverse Pregnancy Outcome 24
2.5.1 Abortion 24
2.5.2 Low birth weight, preterm birth and small-for-gestational age 24
2.5.3 Child mortality 24
2.6 Short Interpregnacy Intervals and Maternal Outcome 25
2.7 Family Planning 25
2.8 Benefits of Family Planning 26
2.8.1 Social and Economic Benefits 26
2.8.2 Health Benefits to the Mother 26

2.9 Postpartum Family Planning 28
2.10 Prevalence of Postpartum Family Planning 30
2.10 Family Planning Methods for Postpartum Women 31
2.11 Factors Associated with Postpartum Family Planning Use 31
2.11.1 Demographic Characteristics 32
2.11.2 Socioeconomic Characteristics 32
2.11.3 Fertility Preferences 32
2.11.4 Use of Maternal Health Services 33
2.11 Strategies to Address Unmet Need for Postpartum Family Planning 33
CHAPTER THREE 36
3.0 METHODOLOGY 36
3.1 Study Design 36
3.2 Data Collection Technique and Tools 36
3.2.1 Inclusion Criteria 37
3.2.2 Exclusion Criteria 37
3.3 Study Sites and Population 38
3.4 Study Variables 39
3.4.1 Outcome Variable 39
3.4.2 Risk Factors 39
3.5 Sampling 40
3.5.1 Sampling Technique 40
3.5.2 Sample Size Determination 41
3.6 Pretesting 42

3.7 Data Quality Management 42
3.8 Data Entry and Analysis 43
3.9 Ethical Considerations 44
3.10 Limitations of the Study 45
3.11 Assumptions 45
3.12 Dissemination 46
CHAPTER FOUR 47
4.0 RESULTS 47
4.1 Introduction 47
4.2 Socio-Demographic Characteristics of Respondents 47
4.3 Characteristics of the Male Partner of Respondents 51
4.4 Present and Past Obstetric Characteristics of Respondents 54
4.5 Respondent's Acceptability of Postpartum Family Planning 58
4.6 Respondent's Past Experience and their Intention to Use Postpartum Family Planning 61
4.7 Multivariate Analysis of the Factors Influencing Interpregnancy Intervals of Respondents 65
CHAPTER FIVE 72
5.0 DISCUSSION 72
5.1 Introduction 72
5.2 Socio-Demographic Factors that Influence Interpregnancy Intervals 72
5.3 The Role of Spouses in Influencing Interpregnancy Intervals of their Partners 74
5.4 The Influence of Obstetric History of Respondents and their Interpregnancy intervals . 76
5.5 Past Experience, Acceptability and Intentions of using Postpartum Family Planning in Future 78

5.6 Limitations 81
CHAPTER SIX 84
6.0 CONCLUSION AND RECOMMENDATION 84
6.1 Conclusion 84
6.2 Recommendation 84
REFERENCES 86
APPENDICES 93

LIST OF TABLES

Table 1.1: Socio-Demographic Characteristics of Respondents by their Interpregnancy Interval (IPI) Status…….47

Table 1.2: Socio-demographic Characteristics of Respondents by their Interpregnancy Interval (IPI) Status (Continued)……....48

Table 2.1: Information of Respondents' Partners and their Relationship with their Interpregnancy Interval (IPI) Status……..51

Table 2.2: Information of Respondents' Partners and their Relationship with their Interpregnancy Interval (IPI) Status (Continued)…….52

Table 3A: Information of Current pregnancy and Reproductive (Obstetric) History by Interpregnancy Interval Status of Respondents……55

Table 3B: Information of Current pregnancy and reproductive (Obstetric) history by Interpregnancy Interval Status of Respondents (Continued)……...56

Table 4: Respondent's Interpregnancy Interval Status against their Acceptability of Postpartum Family Planning……. .59

Table 5.1: Respondent's Interpregnancy Interval Status against their Intentions to Use and Past Experience of Postpartum Family Planning…….. .62

Table 5.2: Respondent's Interpregnancy Interval Status against their Intentions to Use and Past Experience of Postpartum Family Planning (Continued)……63

Table 5.3: Relationship between Users/ Non-Users of Family Planning and Future Intentions to Use Family Planning……63

Table 6.1: Factors Influencing Interpregnancy Intervals of respondents from Multiple Logistic Regression……67

Table 6.2: Factors Influencing Interpregnancy Interval of respondents from Multiple Logistic Regression…….68

Table 6.3: Factors Influencing Interpregnancy Intervals of respondents from Multiple Logistic Regression…….69

Table 6.4: Factors Influencing Interpregnancy Intervals of respondents from Multiple Logistic Regression…….70

LIST OF FIGURES

Figure 1: Conceptual framework showing potential factors influencing interpregnancy interval……9

LIST OF MAPS

I. Map of Volta Region Showing all the Districts……..92

LIST OF APPENDICES

Questionnaire……..97

Informed Consent Form…….99

Ethical Review Board Approval Letter……..…….102

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

The timing between one pregnancy and the next, termed the interpregnancy interval (IPI) (also known as birth-to-pregnancy intervals), is known to be associated with risk of pregnancy complications (Conde-Agudelo et al., 2006; Conde-Agudelo et al., 2007). The World Health Organization (WHO) recommends that after a live birth, the appropriate interval before attempting the next pregnancy is at least 24 months in order to reduce the risk of adverse maternal, perinatal and infant outcomes. The basis for the recommendation is that waiting 24 months before trying to become pregnant after a live birth will help avoid the range of IPI associated with the highest risk of poor maternal, perinatal, neonatal, and infant health outcomes. In addition, this recommended interval was considered consistent with the WHO/ United Nations Children's Fund (UNICEF) recommendation of breastfeeding for at least two years. The recommendation further states that after a miscarriage or induced abortion, the recommended minimum interval to next pregnancy is at least six months in order to reduce risks of adverse maternal and perinatal outcomes (WHO, 2005).

A short IPI is defined as any pregnancy occurring before the WHO recommended IPI after a live birth or an abortion. According to WHO Technical Consultation on Birth Spacing, IPI of six months or shorter are associated with elevated risk of maternal mortality and those around 18 months or shorter are associated with elevated risk of infant, neonatal and perinatal mortality, low birth weight, small size for gestational age, and pre-term delivery (WHO, 2005). Research

has shown that both short IPIs (less than 24 month) and long IPIs (more than 60 months) are associated with adverse outcome, but the bulk of adverse effects have been associated with short intervals (Conde-Agudelo A et al., 2006; Conde-Agudelo A et al., 2007). Avoidance of short IPIs can be achieved through the provision of postpartum family planning, but avoidance of long IPIs is more problematic since a desired pregnancy may be precluded by subfertility, availability of a partner, economic issues, or illness.

A report from the Maternal and Child Health Integrated Program (MCHIP) analyzing the 2008 Ghana Demographic and Health Survey (GDHS) data concerning IPI showed that 2% of pregnancies in Ghana occur within very short intervals of less than 6 months, 9% within short intervals of less than 12 months, and another 28% within intervals of 12 – 23 months**.** This implied that over one-third (36%) of all pregnancies in Ghana occurred before the WHO recommended IPI of at least 24 months after the preceding birth. Strikingly, the 2008 GDHS data demonstrated a sharp decrease in infant and childhood mortality rates as the length of the interpregnancy interval increases. Infant mortality decreased by 36%, from 88 deaths per 1000 live births for infants born with IPIs less than 15 months to 56 deaths per 1000 live births for infants born with IPIs between 27 and 38 months. Similarly, higher rates of under-five mortality were observed for children born to mothers with IPI of less than 15 month (131/1000) compared with children born to mothers with IPI between 27 and 38 months (83/1000) (GDHS, 2008).

While family planning (FP) is important throughout an individual's and couple's reproductive life, Postpartum Family Planning (PPFP) focuses on the prevention of unintended and closely spaced pregnancies through the first 12 months following childbirth. The purpose of PPFP is therefore to help women decide on the contraceptive they want to use, to initiate that

contraceptive, and to continue contraceptive use for a year or longer, depending on the reproductive intentions of the woman or couple. A comprehensive PPFP intervention entails continuity of care for the woman and her baby at many points of contact in the health system over a relatively long time horizon (i.e. from the antenatal period to 12 months after birth (WHO, 2013).

The postpartum period provides an important window of opportunity for women to initiate highly effective contraception because they are motivated to prevent another pregnancy. Given the risks associated with closely spaced pregnancies, there has been considerable emphasis on the importance of counseling expectant or recent mothers about their contraceptive options and providing them with their chosen method on a timely basis. The World Health Organization (WHO) estimates that of the 210 million pregnancies that occur yearly worldwide (Singh S et al, 2009), some 80 million (i.e. 38%) are unintended and 33 million (i.e. 41%) of these are due to ineffective use of a contraceptive method (mostly traditional methods) (WHO, 2012). According to W.H.O, approximately 830 women die from preventable pregnancy- or childbirth-related complications around the world every day. Of these deaths, 99% of them occur in developing countries (WHO, 2015).

Each year, FP programmes prevent an estimated 187 million unintended pregnancies, including 60 million unplanned births and 105 million abortions, and avert an estimated 2.7 million infants' death and 215000 pregnancy related deaths (Amy and Tripathi, 2009). Globally maternal mortality has witnessed a significant reduction in the last twenty years and this has partly been due to the increase in contraceptive use, with consequent reduction in unintended pregnancies. Tsui et al. noted that in developing countries, the risk of prematurity and infant mortality doubles

when pregnancy recurs within six months of previous birth (Tsui et al., 2010). Ensuring that every woman has only the number of children she desires is an important means of decreasing maternal mortality. FP can avert more than 30% of maternal deaths and 10% of child mortality if couples space their pregnancies more than 2 years apart. (Cleland et al., 2006) Closely spaced pregnancies within the first year postpartum are the riskiest for mother and baby (DeVanzo et al., 2007). A recent 10-year study of maternal mortality in 46 countries found that the risk of maternal death increases as the number of children per woman rises to four or more. The study also found that maternal deaths declined by 7 – 35% as the number of children per woman fell (Stover and Ross, 2010). PPFP, therefore, helps women who have an unmet need to space and limit future pregnancies, while helping to lower rates of maternal and child death.

The major goals of the 1994 Ghana National Population Policy (GNPP) are to reduce the total fertility rate from 5.0 to 3.0 and to increase the contraceptive prevalence rate from 15 to 50 percent between the years 2000 and 2020 respectively. The fertility rate, contraceptive prevalence rate, and the unmet need for family planning were reported by the 2008 GDHS as 4.0, 17% and 35% respectively (GDHS, 2008). The 2011 Multiple Indicator Cluster Survey (MICS) reported an improvement in the CPR from 17% to 23% and reduction in the level of unmet need for family planning from 35% to 23%. A CPR of 22% was estimated from the 2014 GDHS indicating a slight reduction in CPR obtained from the MICS (MICS, 2011). The 2014 GDHS report also showed a recalculated unmet needs estimates for the 2003, 2008 and 2014 using the revised definition of unmet need (Bradley et al., 2012) as 31%, 36% and 30% respectively indicating a stable decline (GDHS, 2014). At current rates, however, the targets set in GNPP are unlikely to be met by 2020.

1.2 Problem Statement

Improving maternal health was one of the eight Millennium Development Goals (MDGs) adopted by the International Community in 2000. Under MDG 5, countries were committed to reducing maternal mortality by three quarters between 1990 and 2015. Since 1990, the number of maternal deaths worldwide has dropped by 43%. The maternal mortality ratio in developing countries in 2015 was 239 per 100,000 live births versus 12 per 100,000 live births in developed countries**.** The World Bank Data on Ghana maternal mortality ratio (MMR) shows about 47% decline from a ratio of 600 per 100, 000 live births in 1990 to 319 per 100,000 live births as at the ending of 2015. This sharp decline has however halted since 2010 with a recorded ratio of 325 deaths per 100,000 live births to date (WHO, 2015)**.** The target under the Sustainable Development Goal 3 is to reduce the global maternal mortality ratio to less than 70 per 100,000 births, with no country having a maternal mortality ratio of more than twice the global average.

The institutional maternal mortality ratio (iMMR), according to the Volta Regional Health Directorate Family Health Unit's (VRHD FHU) 2015 annual report, was 137 deaths per 100,000 live births. This ratio is almost half the country's MMR as at the end of 2015 according to World Bank Data for Ghana MMR. The report also showed that the sharp decline in iMMR has also halted since 2010. The trend in family planning acceptor rate in the region has also seen a consistent decline from 30% since 2012 to 26% in 2015 (VRHD FHU 2015 annual report).

An MCHIP report analyzing the 2008 Ghana Demographic and Health Survey (GDHS) showed that 36% of all non-first births are spaced less than the WHO recommended 24 month IPI, putting women and their infants at increased risk of poor maternal and perinatal outcomes. The

report showed that women in Ghana have a significant unmet need for FP during the two years after birth. The 2014 GDHS also showed that about one third of married women aged 15 – 49 years with one child preferred to have another birth within two years. According to Cleland et al. (2012), if all women in developing countries waited for 24 months after birth before conception, infant deaths would decrease by 10% and child deaths (ages 1 – 4 years) would fall by 21%. Prata et al. (2011) also estimated that PPFP can prevent about 30% maternal mortality and 10% child mortality.

According to the Guttmacher Institute report on abortion in Ghana issued in January 2013, 35% of married women and 20% of sexually active unmarried women have an unmet need for contraception. As a result, more than a third (37%) of all pregnancies in Ghana are unintended: 23% are mistimed and 14% are unwanted. A large proportion of married women – 34% of those with unmet need – cite concerns about health risks or side effects associated with contraceptives as reason why they do not practice contraception (Singh et al., 2009).

Globally, FP is recognized as a key life-saving intervention for mothers and children (WHO 2012b). PPFP has an important role to play in strategies to reduce the unmet need for FP. This is because postpartum women are among those with the greatest unmet need for FP. Yet they often do not receive the services they need to support longer birth intervals or reduce unintended pregnancy and its consequences.

The postpartum period however remains neglected in FP research in Ghana, and there is little or no information on the factors that influence women with short interpregnancy interval PPFP decisions (Eliason et al., 2013). In view of the serious adverse consequence associated with

pregnant women with short IPI, a study that determines the factors influencing IPI among pregnant women is needed.

1.3 Justification

According to an analytical report on the 2008 GDHS issued in January 2015, thirty-six percent of all non-first births in Ghana are spaced less than the recommended 24 month interpregnancy interval, putting women and their infants at increased risk for poor maternal and perinatal outcomes (MCHIP and MCSP report, 2015). In developing countries, if all women waited 24 months after a birth before having another child, infant (< 1 year) mortality, child (1 – 4 years) mortality and maternal mortality would fall by 10%, 21% and 30% respectively (Prata et al., 2011; Cleland et al., 2012).

Among Ghanaian women within two years postpartum, 77% had unmet need for FP; 19% of them were using a method of FP; and only 2% of the women desired another pregnancy within two years. The total unmet need increased as the IPI decreased with an overall unmet need of 68% among women with IPI of 12 – 23 months increasing to 79% for women with IPI of 6 – 11 months (Singh et al., 2009).

Therefore addressing the challenges of achieving the sustainable development goal three concerning maternal and child health must include strategies to reduce the prevalence of short IPI by improving access and use of postpartum family planning.

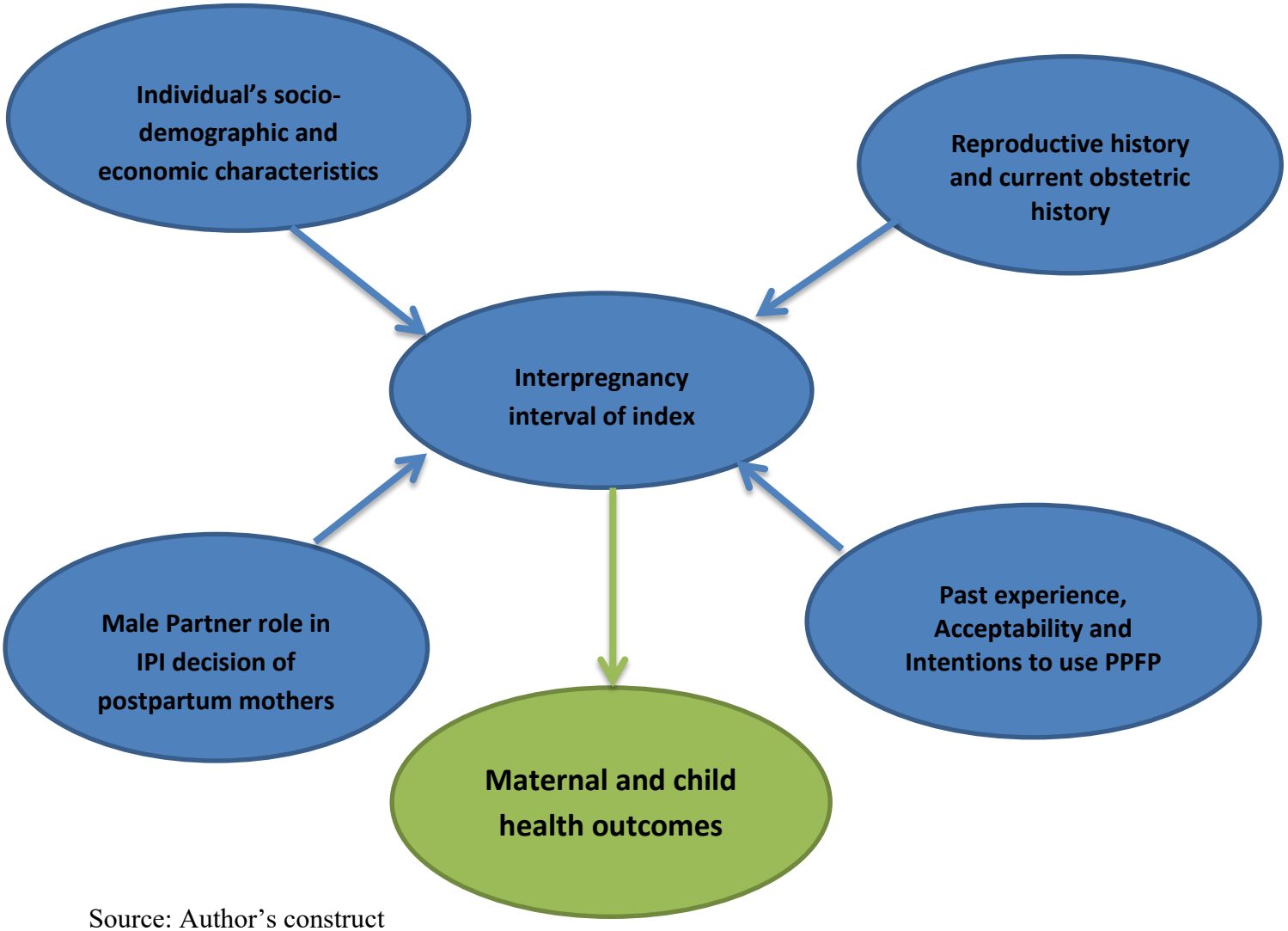
Stephansson et al. (2003) noted that factors such as outcome of previous pregnancies, age and parity of a woman, mode of previous delivery as well as duration of breastfeeding have effect on the length of the IPI. Some studies have also demonstrated socio-economic status as a determinant of IPI (Kaharuza et al., 2001; Gurmu & Mace, 2008). There is however no known study in Ghana or in the Volta that has added to the body of knowledge on factors that affect the IPI from the Ghanaian context.

The child bearing continuum comprising of the antenatal, intra partum, immediate and extended postpartum periods offer great opportunities for contraceptive counseling and initiation of usage of PPFP due to frequent visits to the healthcare facility and regular interactions between pregnant women and health care providers (Warren et al., 2010).

The postpartum period however remains neglected in FP research in Ghana (Eliason et al., 2013), and there is little or no information on the factors that influence IPI and its relationship with PPFP in the Volta Region and Ghana as a whole. This study will also help fill the knowledge gap on the relationship PPFP and IPI which could lead to the development of policies and effective interventions to address the contraceptive needs of this category of women.

The aim of this study is therefore to determine the factors influencing interpregnacy intervals of pregnant women attending antennal care and their postpartum family planning needs.

1.4 Conceptual Framework



Source: Author's construct

Figure 1: Conceptual framework showing potential factors influencing interpregnancy interval

1.5 Research Questions

1. What are the socio-demographic factors that influence interpregnancy intervals (IPIs) among pregnant women?

2. What is the obstetric history of a pregnant woman with different IPIs?

3. What are the intentions and acceptability of postpartum family planning among pregnant women with different IPIs?

4. What role do spouses of pregnant women play in influencing their IPIs?

1.6 General Objective

To determine the factors influencing interpregnancy intervals among pregnant women

1.7 Specific Objectives

1. To determine the socio-demographic factors influencing the interpregnancy intervals
2. To describe the obstetric history of pregnant women with different interpregnancy intervals
3. To determine the intention and acceptability of postpartum family planning among pregnant women with different interpregnancy intervals
4. To determine the role of spouses in influencing interpregnancy intervals of their partners.

1.8 Profile of Study Area

Volta Region is one of the ten regions in Ghana. It lies on the eastern side of the country. It shares boundaries to the west with Greater Accra, Eastern and Brong Ahafo regions, to the north with the Northern Region and has the Gulf of Guinea to the south. Its total land area is 20,570 square kilometers, representing 8.7 percent of the total land area of Ghana.

The population size has increased from 777,288 in 1960 to 2,118,252 by 2010, more than double in just over fifty years. Between the 2000 and 2010 censuses, the population increased by 29.5 percent, which translates into an annual growth rate of 2.5 percent. The data show that Ho and Hohoe Municipalities, together account for just over a quarter (of the total regional population) as having the highest population sizes. The least populated district is South Dayi with only 2 percent of the regional total population. The most densely populated district is Keta Municipal with 358 persons per kilometer, followed by Ketu South with 206 persons per square kilometer, and South Tongu (196 persons per square kilometer). On the other hand, the most sparsely populated districts are Krachi West (29 persons per square kilometer) and Nkwanta South (26.02 persons per kilometer) (PHC, 2010).

The region has a total of 326 health institutions out of which 242 are administered by the Ghana Health Service (GHS), 18 are mission owned, one is quasi-government and 65 are privately owned.

The 2010 Population and Housing Census (PHC) report showed a regional age structure of 38.4% for age 0 – 4 years, 55.1% for age 15 – 59 years and 6.5% for age above 60 years indicating a youthful population. The 2014 GDHS results indicated that there has been a slight

increase in the Total Fertility Rate (TFR) over the past six years, from 4.0 to 4.2. This is in contrast to the marked decline in fertility observed between the mid-1980s and the 1990s. The TFR declined from a high of 6.2 births per woman in 1988 to 5.2 births in 1993, 4.4 in 1998 and 2003, and 4.0 in 2008 before increasing slightly to 4.2 in 2014. The 2014 report however showed that Volta Region has the highest CPR of 32% (which makes it curious why TFR showed an increase) and Northern Region having the lowest with 11%.

Volta Region was selected for this study because no known study of this type has been undertaken there and therefore the information from this study will help in developing PPFP interventions to reduce the prevalence of short IPI and the unmet need for FP in this category of women.

The study was conducted in three public health facilities located in three districts in the southern part of Volta Region and they included Keta Municipal Hospital, Ketu-South District Hospital and Akatsi-South District Hospital.

Akatsi-South District: It is one of the 18 administrative districts in the region and it shares boundaries with Keta Municipal to the south, Ketu-North to the east, to the west by South-Tongu District and to the north by Akatsi-North District. The population of Akatsi-South District, according to the 2010 Ghana Population and Housing Census, is 98684 comprising of 53.9% females and 46.1% males. About 67% of the population lives in rural areas. The Total Fertility Rate (TFR) for the District is 3.4 and a WIFA population of 25911. 97.5% of the economically active population is employed mainly in agriculture, fishing and petty trading. Of the population 11 years and older, about 70% are literate (PHC report, 2010; VRHD annual report, 2015).

Keta Municipality: The population of Keta Municipality, according to the 2010 Ghana Population and Housing Census, is 147168 comprising of 46.4% males and 53.6% females. More than half (53.3%) of the population live in urban areas. The Municipality has a youthful population with 34.6% below 1515 years. The TFR is 3.1 and a WIFA population of 40083. About 64% of the population aged 15 years and older is economically active with 93.5% of them being employed. The main occupations in the Municipality include fishing, farming and petty trading. Of the 27047 persons 11 years and older in the Municipality, about 75% are literate (PHC report, 2010; VRHD annual report, 2015).

Ketu-South Municipality: This Municipality is described as the eastern gateway to Ghana and it is the only district that shares boundary with the capital of another country, Lome in the Republic of Togo. The Municipality is shares border on the west with Keta Municipality, the north with Ketu-North District and the Gulf of Guinea to the south. The population, according to the 2010 Ghana Population and Housing Census, is 160756 with 52.9% being females and 47.1% males. Over half (53.4%) of the population live in rural semi-urban setting. The TFR is 3.1 and a WIFA population of 43661. The Municipality has a youthful population. 71% of the population aged 15 years and older are economically active and 95.5% of them are employed. The main occupations in the Municipality include crafting, agriculture, fishing and petty trading. Of the population 11 years and older, 72% are literate (PHC report, 2010; VRHD annual report, 2015).

1.9 Scope of Study

The study focused on all pregnant women with at least one previous live birth delivery (i.e. parity of one or more) attending ANC clinic, who did not have any contraindication to the use of contraceptives, at the three District Hospitals located in Keta Municipality, Ketu-South District and Akatsi-South District.

1.10 Organization of Report

The report for this thesis begins with a declaration, dedication, acknowledgement, abstract of the project and table of contents. The actual report is organized into six chapters.

Chapter one is made up of the introduction comprising of background of the study, problem statement, justification of the study and study objectives. Chapter two highlighted the review of literature of different authors whose work has some relationship with the project topic. Chapter three focused on the research methodology that was employed in exploring the subject matter in order to achieve the aim of the study. Chapter four dealt with presentation of the results of the study in tables, figures and in narrative format based on the data collected and analyzed. Chapter five also highlighted the discussion portion of the thesis which compared the important results elucidated from the study in relationship with previous work already conducted on the subject matter. Chapter six of the project expounded on the implication of the findings and their significance based on whether objectives were achieved.

The report ends with lists of references and appendices.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Interpregnancy Interval

Researchers determining factors that affect fertility and fertility outcomes have used various definitions of birth interval which sometimes makes it difficult to compare results. There are four principal terminologies used to describe birth interval. Birth-to-birth interval refers to the time between the index (current) live birth and the preceding live birth without taking into consideration pregnancies that occur in between but do not end in a non-live birth. Inter-outcome interval refers to the time interval between the outcome of the index pregnancy and the outcome of the previous pregnancy. It must be noted that the starting point and / or the end point with this measure can be a non-live birth. Another term is the birth-to-conception interval which is the time between the conception of the current pregnancy and the previous live birth. This measure also omits pregnancy that does not result in live birth (i.e. abortion) from consideration. The last terminology is the interpregnancy interval (IPI) which is the time in between the index pregnancy and a previous live or non-live birth. When the interval is measured after a live birth, it is referred to also birth-to-pregnancy. This measure is feasible compared to birth-to-conception interval since in practice, the reported date of last menstrual period is usually measured and not the initiation of the pregnancy itself. IPI is often used in many studies interchangeably with birth-to-pregnancy interval (WHO, 2005)

Different definitions are used because they are appropriate in different situations. For example, surveys done among populations unsure of conception dates use interbirth intervals, register-based and cohort studies use either pregnancy or birth-to-conception intervals. Thus, lack of a uniform definition of pregnancy intervals presents a problem in interpreting and comparing studies (Winikoff, 1983; Koeinig et al., 1990).

The WHO document that streamlined the optimum birth interval chose to use interpregnancy interval (also known as birth-to-pregnancy interval) as a standard term in making their recommendations (WHO, 2005). It is defined as the interval between the date of a live birth and the start of the next pregnancy. The document recommended that after a live birth, the appropriate interval before attempting the next pregnancy is at least 24 months in order to reduce the risk of adverse maternal, perinatal and infant outcomes. The basis for the recommendation is that waiting for 24 months before trying to become pregnant after a live birth will help avoid the range of IPI associated with the highest risk of poor maternal, perinatal, neonatal, and infant health outcomes. The 24 months recommendation was considered by the WHO to be consistent with the WHO/United Nations International Children's Emergency Fund (UNICEF) recommendation of breastfeeding period of at least 2 years (WHO, 2007). The recommendation further stated that after a miscarriage or induced abortion, the recommended minimum interval to next pregnancy is at least six months in order to reduce risks of adverse maternal and perinatal outcomes. A short IPI is therefore defined as any pregnancy occurring before the WHO recommended IPI after a live birth or an abortion.

2.2 Components and Determinants of Reproductive Stages in women

The variation and effects of birth spacing is appreciated by understanding the determinants of human fertility and reproduction. Women will produce a certain number of children by the end of their reproductive lifetimes because of the way in which they time their various reproductive events. Menarche signals the beginning of fecundity (the biological capacity to reproduce). Following pregnancy, a woman will remain infecundable until the normal pattern of ovulation and menstruation is restored. The time spent in different reproductive states will cause interpopulation and intrapopulation variation in fertility. However, a number of factors determine the time spent in each of these intervals.

One framework which considered socio-cultural factors as the determinant of the three necessary steps in human reproduction: intercourse, conception, and pregnancy (gestation and parturition) indicated that any factor that affects fertility must do so through its effect on one of the "proximate determinants" or the "intermediate fertility variables" (Bongaarts, 1978). The proximate factors comprise of exposure factors and susceptibility factors. Thus, after menarche and before menopause, fertility will depend on factors that affect fecundability, defined as the probability that a fecundable couple will conceive during the month of exposure to unprotected intercourse. The exposure factors that determine the probability of conception include:

1. Age at menarche
2. Age at marriage or entry into sexual union
3. Age at menopause
4. Age at onset of pathological sterility (if earlier than menopause)

The susceptibility factors govern the conditional probability of successful reproduction, given that the exposure occurs. The susceptible factors include:

1. Duration of lactational infecundability
2. Duration of the fecund waiting time to conception; which is determined by the following factors:
    - Frequency of insemination
    - Length of ovarian cycles
    - Duration of fertile time given ovulation
    - Probability of conception from a single insemination in the fertile period
3. Probability of foetal loss
4. Length of the nonsusceptible period associated with each foetal loss
5. Length of gestation resulting in live birth

Proximate determinants exert a direct effect on each of the time interval because they determine the length of these intervals. The postpartum infecundable period is a period between delivery and the first postpartum ovulation. This period is lengthened by lactational behavior and nutritional status of the mother (Howie and McNeilly, 1982; Kaharuza, 2001). The fecund waiting time to conception, also called the fecundable period, occurs from the first postpartum ovulation to conception. Fecundity depends on ovum viability and sperm capacity to fertilize. Sexual activity patterns including low frequency of sexual intercourse and postpartum abstinence, and use of contraception would prolong birth intervals. In some cases, prolonged birth intervals are due to time added by a pregnancy loss.

2.3 Prevalence of Short Interpregnancy Interval

The overall public health importance of short IPI is determined not only by the risks of mortality and morbidity of the preceding child, subsequent child, and the mother, but also by the prevalence of short interval in the population (Kaharuza, 2001) Since most research in developed countries have focused on the association between short birth intervals and adverse perinatal outcomes, different cutoff points for short birth intervals have been used.

A report from the Maternal and Child Health Integrated Program (MCHIP) analyzing the 2008 GDHS data concerning pregnancy spacing showed that 2% of pregnancies in Ghana occur within very short intervals of less than 6 months, 9% within short intervals of less than 12 months, and another 28% within intervals of 12 – 23 months which culminates into a prevalence of 36% of all non-first births as being spaced less than the WHO recommended 24-month IPI (MCHIP and MCSP report, 2015).

2.4 Determinants of Short Interpregnancy Intervals

2.4.1 Birth History of Respondents

Previous child loss and adverse pregnancy outcome are strongly associated with interpregnancy intervals. According to Kaharuza (2001), child replacement strategy after child mortality has been observed in some countries as a determinant of short interval pregnancy.

Sex of the index child was found to be a strong determinant of birth interval among respondents. Study from Manipur showed that average birth interval was significantly shorter for women with a preceding birth of a female child (Singh et al., 2010). The same study also reported that mothers who had previous infant mortality were more likely to have long birth intervals as compared to their counterparts.

Regarding pregnancy plan, study done in Denmark indicated respondents with planned pregnancy were more likely to have longer birth intervals than those who reported that their pregnancy occurred unintentionally. The study also reported that irregular menstruation showed a significant correlation with birth interval (Kaharuza et al., 2001).

Women with history of caesareans section and instrumental deliveries have longer interpregnancy interval on account of longer period to recovery and consequent late resumption of sexual activity. Episiotomy given during instrumental deliveries equally delays initiation of sexual activity. Women that undergo caesarean section delivery are usually advised to delay onset of new pregnancy till about 12 to 18months to prevent the risk of uterine rapture in subsequent pregnancies and attendant morbidity and mortality of mother and/or baby (Owonikoko, 2015).

2.4.2 Lactation

The greater fertility following child mortality has both biological-lactation and behavioral components. Child death removes the protective effect of lactation. Lactation durations are behaviorally determined as mothers may opt to breastfeed for shorter periods.

According to the study conducted in Iran among multiparous women, duration of breastfeeding was found to be an independent predictor of birth intervals. It showed that women who breastfeed their child for longer than 24 months were more likely to have longer birth intervals than those who feed for less than 6 months. This finding is collaborated by several other studies including a study in Nigeria (Hajian-Tilaki, 2009; Kemi and Olurotimi, 2011)

2.4.3 Maternal Age and Parity

Studies have shown the association between maternal age and parity with some of them showing that young mothers in developing countries are more likely to have short IPI. This could be due to the fact that recovery of ovarian function is faster among young mothers than older mothers (Moran et al, 1994). There could also be a reverse situation where older mothers may be more likely to have shorter interval so that they can quickly complete their family size (Moran et al., 1994).

Findings from African countries have shown relationship between maternal age and birth interval. According to a study done in Tanzania, maternal age was inversely related with nonadherence to the recommended minimum length between two live births. The proportion of interbirth intervals that were poorly spaced was highest (76%) among youngest (15 – 19 years) women and declined rapidly with increasing age to as low as 30% among the oldest (45 – 49 years) women (Exavery et al., 2012). Findings from report on Ethiopian Demographic Health Survey (DHS) 2011 showed that young maternal age had significant association with birth interval. The median birth interval increases with ag, ranging from 28.5 months for births to

women aged 15 – 19 years to 38.7 months for births to women aged 40 – 49 months (CSA, 2011).

2.4.4 Socio-economic Risk Factor

An important risk factor for short birth intervals is the social-economic status (SES) of the mother. SES has been defined as "a composite measure that typically incorporates economic status, measured by income, social status, measured by education and work status measured by occupation (Alder et al., 1994).

Education is the most frequently used measure followed by occupation, and composite measures. Of all the SES measures, education has the advantage of being the simplest to collect, is stable over one's lifetime, reasonably accurate, and is associated with lifestyle characteristics and health behaviour. Social status indicators are difficult to define in developing countries since most of them do not know their monthly income as most are self-employed in agriculture or are unemployed. This has led to the usage of amenity score in studies in these setting and is usually population and study specific (Cortinovis et al., 1993)

According to Kaharuza (2001), studies from both developing and developed countries have consistently shown the association between low social status and short IPI.

A study in southern Ethiopia showed that maternal education has protective effect for short IPI as women who had no formal education were 1.9 times more likely to have short IPI as compared to those who had formal education (CSA, 2011).

A study in Nepal showed that the occupation of mothers had a significant predictor of IPI. The study also occupations of husbands were significantly associated with IPIs. Women whose husbands were engaged in agriculture had longer IPI as compared to those working in business and cottage industry. The Ethiopian study also showed women whose husbands were students were found to be significant predictors of short IPI.

Another study in Tanzania revealed that short birth spacing was higher among women that resided in rural areas than their urban counterparts (50% versus 45%) and the difference was statistically significant. (Yohannes, 2011).

2.4.5 Knowledge and Attitude of Women about Contraception and Birth Spacing

Contraceptive method utilization is cited as one of the major determinants of length of birth intervals. The study in Manipur indicated that women who used modern contraception were more likely to have longer birth intervals than those who never used any contraceptive method (Singh et al., 2010).

2.5 Short Interpregnancy Intervals and Risks of Adverse Pregnancy Outcome

2.5.1 Abortion

Studies from developed countries suggest that both short and long IPIs are associated with spontaneous abortion in the subsequent pregnancy, especially if the interval is less than six months or longer than 60 months. (Wohlfahrt et al., 2000; Conde-Agudelo and Belizan, 2000)

2.5.2 Low birth weight, preterm birth and small-for-gestational age

Meta-analysis of studies from 1970 to 1987 in low birth weight (LBW) has shown that the effects of short birth intervals on LBW as inconclusive, but also that the short IPIs may not be an important cause of intrauterine growth retardation (IUGR) in the United States, where most of the reviewed studies were carried out (Kramer, 1987). More studies have shown a positive association between short birth intervals and low birth weight, preterm birth and small-for-gestational age. The LBW outcomes were curvilinear with high risk for the short and very intervals in United States and India (Kaharuza, 2001).

2.5.3 Child mortality

The relationship between birth interval and neonatal, infant and childhood mortality has been studied extensively from World Fertility Surveys, Demographic Health Surveys, and household survey data obtained from a number of developed and developing countries (Kaharuza, 2001).

The association between short birth intervals and perinatal mortality is strong even after controlling for length of gestation, previous child mortality, and other potential confounders. Child mortality trend studies show that despite reduction of child mortality and some associated risk factors decreasing, short birth interval levels have remained unchanged. (Hill and Pebley, 1989). Given the consistent association between short birth intervals and child mortality, reduction in short birth intervals would have a great impact on reducing child mortality.

2.6 Short Interpregnacy Intervals and Maternal Outcome

According to Kaharuza (2001), short IPIs were associated with maternal postpartum depression and an increased risk of uterine dehiscence or rupture during trials of labour following a previous Caesarean section delivery. The effect of birth intervals on maternal mortality is inconclusive with higher risk of death in some studies based on hospital records and no effect in others. (Ronsmans and Campbell, 1998; Conde-Agudelo and Belizan, 2000).

2.7 Family Planning

Family planning (FP) is the decision-making process by couples, together or individually, on the number of children that they would like to have in their lifetime, and the age interval between children. FP is an essential component of health care provided during the antenatal period, immediately after delivery and during the first year postpartum (WHO, 2009). It is one of the leading strategies to improve family life and welfare, control unwanted population growth, and

aid the development of the nation. The terms ‘’family planning’’ and ‘’contraception’’ are often used interchangeably. The term FP works best when talking about couples or when discussing not only the method of contraception but also issues related to family planning information, counseling, commodities, and the health system. However, when discussing issues related to single people and unmarried youth in particular, the term “contraception” or “contraceptive services” is more accurate.

2.8 Benefits of Family Planning

There are several benefits of FP and they comprise of:

2.8.1 Social and Economic Benefits

Family planning reduces health risks to women and gives the more control over their reproductive lives. With better health and greater control over their lives, women can take advantage of education, employment and civic opportunities. Families with fewer children are often able to send those children to school so girls get a chance to attain higher education (Hatcher et al., 2007).

2.8.2 Health Benefits to the Mother

Contraceptive use reduces maternal mortality and improves women’s health by preventing unwanted and high-risk pregnancies and reducing the need for unsafe abortions. Some

contraceptives also improve women's health by reducing the likelihood of disease transmission and protecting against certain cancers. Other maternal benefits of FP are:

- Avoiding too early and too late pregnancies

Family planning helps mothers avoid pregnancy when they are vulnerable because of their youth or old age. The risk of having pregnancy-induced hypertension is much higher in younger mothers. On the other hand, older mothers, who have given birth to five or more children, have a tendency to uterine rupture during labour, which can cause severe vaginal bleeding and haemorrhagic shock.

- Limiting the number of pregnancies

Once the desired number of children has been achieved, a woman can avoid further pregnancy by using FP methods. Any pregnancy and birth equal to or higher than five can have greater risks for the mother. The risk of dying from multiparity increases for a woman who has birth to five or more children; her risk is 1.5 to 3 times higher than those who have given birth to two to three children.

- Preventing abortion

Most abortions result from unwanted pregnancy, and significant numbers of maternal deaths can be attributed to unsafe abortion induced by untrained practitioners (Hatcher et al, 2007).

2.9 Postpartum Family Planning

Postpartum family planning (PPFP) is defined as the prevention of unintended pregnancy and closely spaced pregnancies through the first 12 months following childbirth. Postpartum women are among those with the greatest unmet need for FP. Yet they do not receive the services they need to support longer birth interval or reduce unintended pregnancy and its consequences. PPFP addresses the needs of those who wish to have children in the future (referred to as 'spacers'), as well as those who have reached their desired family size and wish to avoid future pregnancies (referred to as 'limiters').

Rationales for PPFP include:

1. According to an analysis of Demographic and Health Surveys data from 27 countries, 95% of women who are 0 – 12 months postpartum want to avoid a pregnancy in the next 24 months; but 70% of them are not using contraception (Ross and Winfrey, 2001).
2. FP can avert more than 30% of maternal deaths and 10% child mortality if couples space their pregnancies more than 2 years apart (Cleland et al., 2006).
3. Closely spaced pregnancies within the first year postpartum are the riskiest for the mother and baby, resulting in increased risks for adverse outcomes, such as preterm, low birth and small for gestational age. Pregnancy occurring within six months of the last delivery holds a 7.5 – fold increased risk for induced abortion and a 1.6 – fold increased risk of stillbirth.(Da Vanzo et al., 2007)

4. Risk of child mortality is the highest for very short interpregnancy intervals (< 12 months). If all couples waited 24 months to conceive again, under-five mortality would decrease by 13%. (Rutsein, 2008).
5. Postpartum women may not realize they are at risk of pregnancy even if they are breastfeeding. A study in Egypt found that 15% of breastfeeding women, who were not using the Lactational Amenorrhoea Method of contraception, conceived prior to resumption of menses. (Shaaban and Glasierr , 2008)

The purpose of PPFP is to help women to decide on the contraceptive they want to use, to initiate that contraceptive, and to continue contraceptive use for 2 years or longer, depending on the reproductive intentions of woman or couple.

A comprehensive PPFP intervention entails continuity of care for the woman and her baby at many points of contact in the health system over a relatively long time horizon (i.e. from the antenatal period to 12 months after birth). Comprehensive may involve many cadres of health workers at different points along the prenatal to postpartum continuum in both the facility and the community. Coordination within the health system – such as integrating services and providing referral linkages between community and facility, antenatal care (ANC), birthing, postnatal care (PNC), and child health and FP services – may ensure continuity of care and access to services. (WHO, 2012)

2.10 Prevalence of Postpartum Family Planning

Adoption of postpartum contraception enables women to have a more fulfilled life even as they have the opportunity to pursue goals that they might otherwise have been unable to pursue. The prevalence of postpartum family planning varies from country to country with high rates being recorded in developed countries and low rates in developing countries. In Indonesia for instance, postpartum contraceptive rates are as high as 75% (Gebreselassie et al., 2008) compared to Zambia which has a prevalence rate of only 33% (Ross and Winfrey, 2001).

According to the Guttmacher Institute report in January 2013, 35% of married women and 20% of sexually active unmarried women in Ghana have an unmet need for contraception. As a result, more than a third (37%) of all pregnancies in Ghana are unintended: 23% are mistimed and 14% are unwanted. A large proportion of married women – 34% of those with unmet need – cite concerns about health risks or side effects associated with contraceptives as reason why they do not practice contraception. Among Ghanaian women within two years postpartum, 77% had unmet need for FP; 19% of them were using a method of FP; and only 2% of the women desired another pregnancy within two years. The total unmet need increased as the IPI decreased with an overall unmet need of 68% among women with IPI of 12 – 23 months increasing to 79% for women with IPI of 6 – 11 months (Singh et al, 2009).

2.10 Family Planning Methods for Postpartum Women

There are several family planning methods that can be used by postpartum women and can be initiated immediately after delivery. Some methods are recommended for all women while others depend on the feeding option chosen for the newborn. For all women, barrier methods such as condoms, diaphragms and cervical caps can be used immediately after delivery. Intrauterine devices and female sterilization can be initiated from the immediate post-delivery period up to about 48 hours if not, then will have to be delayed till 4 and 6 weeks later respectively. For breastfeeding women, the Lactational Amenorrhoea Method (LAM) is started immediately after delivery up to six months; progestogens can be started 6 weeks post- delivery while combined progesterone-oestrogen contraceptives are started after 6 months. In the case of women who are not breastfeeding, other recommended methods are progestogens right after delivery and the combined method 3 weeks after delivery (USAID, 2008).

2.11 Factors Associated with Postpartum Family Planning Use

Several studies have looked at the relationship between postpartum family planning and potential explanatory factors and some of these are:

2.11.1 Demographic Characteristics

In general, older women use postpartum family planning less frequently than younger women. However, there is not a clear trend that the youngest women use family planning more than middle-aged women. One study in Nigeria used birth order or parity and it did not show a clear relationship with PPFP use (Akinlo et al., 2013).

2.11.2 Socioeconomic Characteristics

Wealth has been found to have a strong relationship with PPFP use. Education was also found in all cases to be related to greater PPFP use. In bivariate relationships, being in an urban area was positively related to the use of PPFP. However, this relationship frequently disappeared in multivariate analyses where other control variables were included (Hotchkiss and Do, 2013).

2.11.3 Fertility Preferences

A four country studies showed wantedness of the child that was just born does not been correlate with PPFP use. (Gabreselassie et al., 2010) However, a forward-looking fertility preference were examined for Bolivia, Egypt, Thailand, Kenya and Zambia (Zerai and Tsui, 2001; Hotchkiss and Do, 2013). They were all significantly correlated with PPFP use in all countries except Zambia.

2.11.4 Use of Maternal Health Services

Use of antenatal care and/or delivery care has been examined in most studies that assess their association with PPFP usage and they were found to be related.

2.11 Strategies to Address Unmet Need for Postpartum Family Planning

- **Raise Awareness of FP Needs of Postpartum Women**

Providers, women, their families and communities, as well as policymakers and program managers, are often unaware of the need for PPFP and / or don't know that a woman's fertility can return in the early months after birth and that with timely initiation most contraceptive methods are safe for the breastfeeding mother. In addition, policymakers need compelling arguments to expand their focus beyond antenatal care, labor and delivery care, and child care, to address postpartum care, including PPFP.

- **Ensure No Missed Opportunities across the Continuum of Care**

The continuum of care throughout a woman's pregnancy, childbirth and postpartum provides an array of opportunities to reach her with FP counseling and services. Between 50% and 60% of pregnant women make prenatal visits or have contact with health care providers at or soon after delivery, and additional contacts occur for infants care and other comprehensive maternal, immunization, nutrition and community health care, it provides more acceptable, timely and

effective ways of reaching postpartum women and addressing their FP needs (Huntington and Aplogan, 1994; Saeed et al., 2008).

- **Organize Services**

Efficient organization of services is essential to allow enough time to include FP counseling and decision-making, and to ensure that integrated services , such as birthing units or immunizations sessions, have all the necessary equipment, supplies, contraceptives and trained staff to provide FP, including long-acting and/ or permanent methods. Preservice and in-service training of all MCH healthcare providers should ensure that all are skilled in PPFP counseling and services.

- **Maximize Community-Based Care**

One survey conducted in 2006 revealed that 50% of all births occur outside of health institution and of those, 70% receive no postpartum care (Fort et al., 2006). As a result, these women have limited opportunities to receive FP information or services. And disadvantaged groups such adolescents, minorities, and rural women may have less access. Community health workers can bring information and services to women and men in the communities where they live, rather than requiring them to visit health facilities, which may be distant or otherwise inaccessible. Men may effectively be involved in PPFP in their role in decision-making, in influencing the attitudes of families and communities, and as clients.

- **Expand the Range of Options**

PPFP methods that can be initiated immediately following birth include:

1. The intrauterine device, which can be inserted immediately and up to 48 hours after birth or after four weeks
2. A tubal ligation, which can be performed up to one week after birth or after six weeks
3. A vasectomy, which can be performed for the woman's partner any time during pregnancy or the postpartum period. In fact, vasectomy is a very appropriate and convenient postpartum method because the 12 – week period that it takes before the male is infertile coincides with the normal practice of postpartum abstinence. The extended postpartum period provides the only opportunity for a woman to use the Lactational Amenorrhoea Method (LAM), which can be effectively used up to six months postpartum while the mother is fully breastfeeding, thus providing important nutrition to the infant. (Ross and Winfry, 2001). Other methods, including pills, injections, implants and condoms, can be safely used by the breastfeeding or non-breastfeeding mother, although desired time of initiation may vary by method and breastfeeding status.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Study Design

This study employed health facility-based cross-sectional study design using an interviewer-administered structured questionnaire adapted from both the 2014 Ghana Demographic Health Survey and the questionnaire used in the Eliason et al. (2013) study.

3.2 Data Collection Technique and Tools

Two data sources were accessed using interviewer-administered structured questionnaire i.e. oral information and that from patients' antenatal booklet.

The structured questionnaire was adapted from the 2014 GDHS and the questionnaire used in the Eliason et al. (2013) study. The structure of the questionnaire consisted of respondent's socio-economic information, current partner information, reproductive history, information on current pregnancy and respondent acceptability, intention and past experience of PPFP.

Those aspects of the respondents' information concerning their reproductive history and current pregnancy status were extracted from their antenatal booklet.

Given the difficulties in the collection of income and expenditure data in low- and middle-income country settings to determine the socioeconomic status (SES) of the respondents, we developed a scale by assessing ownership of twelve durable household assets and infrastructure.

Data collectors were staff nurses and midwives who were selected based on their ability to translate the questionnaire into the local language (ewe). They were trained on quality data collection techniques as well as how to protect the privacy and confidentiality of the respondents.

All pregnant women attending the ANC clinic were screened for eligibility and interest in joining the study. A convenience sampling was utilized in recruiting study participants from the successfully screened pregnant women.

3.2.1 Inclusion Criteria

The inclusion criteria used in screening the participants included:

1. All pregnant women with at least one previous live birth delivery (i.e. parity of one or more) who attended ANC clinic during the study period.
2. All eligible pregnant women who attended the ANC clinic and agreed to participate in the study.

3.2.2 Exclusion Criteria

The exclusion criteria used in screening the participants included:

1. Pregnant women with no previous live birth delivery (i.e. nulliparity).
2. Pregnant women with medical conditions which prevented the usage of contraceptives.
3. Pregnant women who did not consent to participate in the study.

3.3 Study Sites and Population

The study was conducted in three public health facilities (i.e. Keta Municipal Hospital, Ketu-South District Hospital and Akatsi-South District Hospital) based on the geographical location in the Region and on the level of development of the districts in which they situated. Another important factor which was considered in their selection was the population of women in the fertility age (WIFA) in the districts in which the hospitals are located.

Keta Municipal Hospital (KMH) is located in Keta, a predominantly urban district in the southern part of the region with a WIFA population of 40,083 ranking as the second highest in the southern part of Volta region and the 4^{th} highest in the region after Ho, Hohoe and Ketu-South respectively according to the 2015 annual Volta Regional Health Directorate (VRHD) report. It is the only government-owned Hospital in the Municipality aside a Catholic-owned Hospital situated at Abor. KMH serves as the preferred referral site to most of the Health Centres in the district.

Ketu-South District Hospital is also located in the southern part of the region sharing boundary with Keta on the east and Togo to the west. The district has three hospitals with two of them being private and the district hospital being the government-owned facility. The district has a

WIFA population of 43661 ranking as the highest in the southern part and the 3rd highest in the region (VRHD 2015 annual report).

Akatsi-South District Hospital is located in Akatsi-South District which also shares boundary with Keta with a WIFA population of 25,911 ranking as the 4th highest in the southern part and the 8th highest in the region. It is the only hospital in the district serving as the only referral site for all the lower health facilities in the district.

3.4 Study Variables

3.4.1 Outcome Variable

The outcome variable that was measured in this study was the preceding IPI status of the pregnant woman. An IPI is defined as the interval between the date of birth of the previous live birth and the estimated date of conception of the index pregnancy. This was determined by subtracting the number of completed weeks of gestation from the date of birth of the index child. An IPI status was determined for each respondent based on the calculated IPI (in months). A respondent with a calculated IPI of less than 24 months, based on the WHO birth spacing standard (WHO, 2007), was assigned a short IPI status and then vice versa.

3.4.2 Risk Factors

The risk factors that were employed in this study included maternal age, parity, marital status, education, ethnicity, socio-economic status measured by the domestic amenity score obtained

from ownership of twelve durable household assets and infrastructure, spousal role, previous pregnancy outcome, past experience with PPFP, PPFP intentions and PPFP acceptability and etc.

3.5 Sampling

3.5.1 Sampling Technique

Purposive sampling was employed in selecting the three Government hospitals based on their geographical location in the region (i.e. the southern part of Volta Region), their level of development and the women in the fertility age (WIFA) population of the district in which the facilities are situated.

A quota-sampling technique corrected for facility antenatal care (ANC) clinic-client load (i.e. probability proportional to the size of the facility's ANC client-load) was used in determining the number of pregnant women to be interviewed in each facility based on the total sample size.

All eligible pregnant women who attended the ANC clinic during the two-month data collection period (i.e. between January 2017 and February 2017) and consented to be part of the study were interviewed.

3.5.2 Sample Size Determination

The precision method was used in computing the sample size based on the 2015 MCHIP report on the 2008 GDHS findings and a confidence interval and margin of error of 95% and 5% respectively (Krejcie and Morgan, 1970).

A quota sample size was utilized in estimating the number of pregnant women that were interviewed in each of the three selected study sites.

The quota was based on the average number of expected registrants and old attendants that were expected to visit the facilities within the study period using the past three months average monthly attendance as a proxy.

Sample Size Formula:

$n = Z^2 \times P (1 – P) / d^2$

n = Estimated sample size

Z = Critical interval of 1.96 at 95% C.I

P = Prevalence of short IPI

d = Margin of error (5%)

Sample Size Calculation:

Prevalence of short IPI = 36% (MCHIP report on the 2008 GDHS findings)

Z = 1.96 (critical value at 95% C.I)

d = 0.05 (accepted margin of error)

$n = (1.96)^2 \times 0.36 (1 - 0.36)/ (0.05)^2$

$n = 354$

The target sample size was adjusted to 400 to account for a 10% rate of non-responders and possible incomplete questionnaires.

Sample size for each of the three public health facility was determined based on their average monthly ANC client load. Keta Municipal Hospital with the highest average monthly ANC client load (i.e. 750) accounted for 40.5% of the total sample size followed by Ketu-South Municipal Hospital (with 643 average monthly attendance) representing 34.7% of the total sample size and lastly by Akatsi-South District Hospital (with 460 average monthly attendance) accounting for 24.8% of the total sample size.

3.6 Pretesting

The data collection tools were pre-tested in 10 pregnant women attending antenatal clinic at South Tongu (Sogakope) District Hospital in the Southern part of Volta Region to enable the necessary modifications of the questionnaire which made it more reliable and easy to administer.

3.7 Data Quality Management

Data quality was ensured by double data entry and data cleaning. Data collectors were selected from the nurses and midwives that worked in that facility. They were then trained to ensure

consistency and correct interpretation of the questionnaire to the understanding of the study participants.

3.8 Data Entry and Analysis

Data collected with the questionnaires were double-entered into Microsoft Excel. The inputs were verified and cleaned to achieve a clean data set. This data set was then exported into STATA (version 14) for analysis.

Socioeconomic status (SES) of the respondents was analyzed by the development of a scale by assessing ownership of twelve durable household assets and infrastructure with weighting of each of these items based on factor scores (eigenvalues) from principal component analysis (PCA) (Manortey et al., 2014). Respondents were assigned individual aggregate SES scores depending on their ownership of these assets. The ranked scores were then categorized into three SES groups as Low, Middle and High.

Descriptive statistics was performed to evaluate the distribution of the participant characteristics and response to the questionnaire. A chi square test of independence was undertaken to ascertain statistically significant association between the outcome variable and all independent variables. Variables that had any cell with expected frequency less than two or table with 20% of the expected frequency less than five (5) was analyzed using the Fisher's exact test instead of chi square. Multivariate analysis was also conducted to further explore statistically significant relationship between all independent variables, which were statistically significant from the

bivariate analysis, and IPI status of the pregnant women while controlling for possible confounders.

3.9 Ethical Considerations

A verbal consent was sought from each pregnant woman attending the clinic in establishing their interest to participate in the study after the risk and benefit of participation were explained and confidentiality assured.

Pregnant women who visited the facility during the study period were screened based on the inclusion and exclusion criteria and those eligible were requested to give their verbal consent to participate.

Considering the sensitivity of the subject matter, personal identifiers of study participants were not taken to ensure anonymity. Data collected from participants were kept strictly confidential under lock and key.

Approval for the study was sought from the Institutional Review Board of Ensign College of Public Health and administrative approval from the Management of the three health facilities.

3.10 Limitations of the Study

The survey was limited by information bias such as recall bias as the accuracy of answers to some of the questions depended on the ability of the respondents to remember. This bias was reduced by reducing the number of such questions on the questionnaire; and the use of the respondents' antenatal booklets as a source of reliable information in answering most of such objective questions.

The study was conducted in only public health facilities which may not be reflective of private health facilities. The study was also limited by iceberg phenomenon as result of the use of hospital data in assessing the burden and determinants of different levels of interpregnancy intervals and post-partum family usage. Another important bias that could have affected the quality of the data collected is the provision of socially desirable response by respondents to subjective questions.

The limitations were reduced by the training of nurses and midwives as data collectors who could translate the questions into ewe for illiterate respondents. Furthermore, the use of interviewer-administered questionnaire ensured a uniform understanding of the questions by respondents.

3.11 Assumptions

It was assumed that those who participated in the study gave correct responses to the data collectors and also that the data collectors accurately captured their responses.

It was also assumed that the number of respondents selected for the study was a true reflection of the population of pregnant women who sought their antenatal care from the three public health facilities.

3.12 Dissemination

The findings of the study were disseminated to the Management of Volta Regional Health Directorate and the Management of the individual Hospitals.

Publication in a peer-reviewed journal and presentations at relevant meetings and conferences will be explored in the future.

CHAPTER FOUR

4.0 RESULTS

4.1 Introduction

This chapter presents the findings of the survey of the factors influencing interpregnancy interval (IPI) of pregnant women presenting at the three District Hospitals during the study period.

4.2 Socio-Demographic Characteristics of Respondents

Of the 400 respondents who presented between the months of January and February 2017 at the Antenatal Clinic of the three District Hospitals where the study was carried out, majority (61.8%) of them were within the age group of 26 – 35 years with mean age and parity of 29 (±5) years and 2 (±5) respectively. Most of the respondents within the 26 – 35 years age group waited for more than 24 months before conceiving their current pregnancy (i.e. had long IPI status) and so was the age group of 36 – 46 years. The only age group that had a higher proportion of short IPI status was the age group of 17 – 25 years. Age was associated with IPI status of the respondents.

Among the respondents, majority of them were married only through traditional rites (49.5%), had middle school/ junior high school as their highest educational level (35.5%), were petty traders (43.3%), had low socio-economic status (59.8%), were resident in Keta District (43.5%) and had between one to three children (85%) (Table 1.1 & 1.2). There was statistically

significant association with between IPI status and the respondents' socio-demographic characteristics with the exception of their area of resident.

The results showed that most of the respondents who were married through traditional rites (67.7%), had middle/ junior high school as their highest educational level (69.7%), with low socio-economic status (54.0%) and had between one to three children (59.5%) had a long IPI status. It was evident from the study that Ketu-South District was the only area of residence, out of the three districts where the study was carried out, that the respondents mostly (57.5%) had short IPI status (Table 1.1 & 1.2).

Table 1.1: Socio-demographic Characteristics of Respondents by their Interpregnancy Interval (IPI) Status

SOCIO DEMOGRAPHIC CHARACTERISTICS, n = 400	Total, n (%)	Interpregnancy Interval (IPI) Status		Chi square ([a]Fisher exact test) p-value
		Short IPI, n (%)	Long , n (%)	
Age (years)				**<0.001****
17 – 25	104 (26.0%)	59 (56.7%)	45 (43.3%)	
26 – 35	247 (61.8%)	90 (36.4%)	157 (63.65)	
36 – 46	49 (12.2%)	10 (20.4%)	39 (79.6%)	
Mean Age (SD) = 29 (±5)				
Marital status				**0.002***
Married through church/mosque/court wedding	69 (17.3%)	28 (40.6%)	41 (59.4%)	
Married only by traditional rites	198 (49.5%)	64 (32.3%)	134 (67.7%)	
Engaged, yet to be married	33 (8.3%)	13 (39.4%)	20 (60.6%)	
Co-habitation	73 (18.3%)	44 (60.3%)	29 (39.7%)	
Divorced/ Separated/ Widowed/ Single	27 (6.6%)	10 (37.0%)	17 (63.0%)	
Educational status				**0.006***
Primary/ Elementary	100 (25.0%)	36 (36.0%)	64 (64.0%)	
Middle school/ Junior High	142 (35.5%)	43 (30.3%)	99 (69.7%)	
Senior High/ Vocational	66 (16.5%)	36 (54.5%)	30 (45.5%)	
Tertiary/ Polytechnic	19 (4.8%)	9 (47.4%)	10 (52.6%)	
No formal education	73 (18.3%)	35 (47.9%)	38 (52.1%)	
Employment status				**0.005***
Unemployed	69 (17.3%)	32 (46.4%)	37 (53.6%)	
Fishmonger/ Fish farmer	44 (11.0%)	26 (59.1%)	18 (40.9%)	
Farmer	25 (6.3%)	4 (16.0%)	21 (84.0%)	
Petty trader	173 (43.3%)	67 (38.7%)	106 (61.3%)	
Salaried worker (Public)	9 (2.3%)	5 (55.6%)	4 (44.4%)	
Salaried worker (Private)	15 (3.8%)	6 (40.0%)	9 (60.0%)	
Others	65 (16.3%)	19 (29.2%)	46 (70.8)	

Source: Survey Data, January – February, 2017

Note: (*) for statistically significant variable when p-value < 0.05 and (**) for statistically significant variable when p-value < 0.001. [a]Fisher's exact test is applied when an expected frequency < 2.

Table 1.2: Socio-demographic Characteristics of Respondents by their Interpregnancy Interval (IPI) Status (Continued)

SOCIO DEMOGRAPHIC CHARACTERISTICS, n = 400	Total, n (%)	Interpregnancy Interval (IPI) Status		Chi square ([a]Fisher exact test) p-value
		Short IPI, n (%)	Long IPI, n (%)	
Socio-economic Status				
Low	239 (59.8%)	110 (46.0%)	129 (54.0%)	0.006*
Middle	133 (33.3%)	39 (29.3%)	94 (70.7%)	
High	28 (6.9%)	10 (35.7%)	18 (64.3%)	
Religion				
Christian	351 (87.8%)	138 (39.3%)	213 (60.7%)	0.332
Muslim	16 (4.0%)	8 (50.0%)	8 (50.0%)	
Traditionalist	29 (7.2%)	12 (41.4%)	17 (58.6%)	
Others	4 (1.0%)	1 (25.0%)	3 (75.0%)	
Number of Children (Parity)				
Mean parity (SD) = 2 (±1)				0.417
One – Three	340 (85.0%)	138 (40.5%)	202 (59.5%)	
Four – Six	56 (14.0%)	19 (33.9%)	37 (66.1%)	
Seven – Nine	2 (0.5%)	1 (50.0%)	1 (50.0%)	
Area of Residence				
Keta District	174 (43.5%)	58 (33.3%)	116 (66.7%)	<0.001**
Ketu-South District	113 (28.3%)	65 (57.5%)	48 (42.5%)	
Akatsi-South District	93 (23.2%)	23 (24.7%)	70 (75.3%)	
Others	20 (5.0%)	13 (65.0%)	7 (35.0%)	

Source: Survey Data, January – February, 2017

Note: (*) for statistically significant variable when p-value < 0.05 and (**) for statistically significant variable when p-value < 0.001. [a]Fisher's exact test is applied when an expected frequency < 2.

4.3 Characteristics of the Male Partner of Respondents

Of the 400 respondents, majority (51%) had partner with age ranging between 20 – 35 years (Table 2.1). In that age group, most of the respondents (53.9%) had a long IPI status. The age of the respondents' male partners was associated with their IPI status (Table 2.1).

The result of the study showed that middle school/ junior high school was the highest educational status of a majority (33.5%) of the respondents' partners. There was a statistically significant association between respondents' IPI status and their partners' educational status (Table 2.1).

Most (19.3%) of the respondents' partners were salary workers in a private firm followed by those whose occupation was fishmonger/ fish farming according to Table 2.1. The respondents whose partners had these occupations mostly experienced long IPI. There was a statistically significant association between partner's occupation and IPI status.

Majority (67.3%) of the respondents' partner had no past marital relationship and 53.9% of these had long IPI status. The result also showed that most of the respondent's partners (65.5%) had no child outside the relationship and 53.1% of them had long IPI status. Similarly, most (78.7%) of the spouse of the respondents had no wife/ partner aside the respondents (Table 2.1).

The results showed that most (50.0%) of the respondents had been in a relationship with their spouse for a period of between 1 – 5 years. As the duration of relationship increases, the proportion of long IPI status increases. There was a statistically significant association between IPI status of respondents and the above spousal characteristics as shown in Table 2.2 below.

Table 2.1: Information of Respondents' Partners and their Relationship with their Interpregnancy Interval (IPI) Status

CHARACTERISTICS OF THE RESPONDENTS' MALE PARTNER n = 400	Total, n (%)	Interpregnancy Interval (IPI) Status		Chi square ([a]Fisher exact test) p-value
		Short IPI, n (%)	Long IPI, n (%)	
Age of Partner (years)				0.041*
20 – 35	204 (51.0%)	94 (46.1%)	110 (53.9%)	
36 – 50	169 (42.3%)	59 (34.9%)	110 (65.1%)	
51 – 70	10 (2.5%)	2 (20.0%)	8 (80.0%)	
No age provided	17 (4.2%)			
Partner's educational status				0.125
Primary/ Elementary	46 (11.5%)	16 (34.8%)	30 (65.2%)	
Middle school/ Junior High	134 (33.5%)	44 (32.8%)	90 (67.2%)	
Senior High/ Vocational	96 (24.0%)	40 (41.7%)	56 (58.3%)	
Tertiary/ Polytechnic	56 (14.0%)	29 (51.8%)	27 (48.2%)	
No formal education	68 (17.0%)	30 (44.1)	38 (55.9%)	
Partner's employment status				0.005*
Unemployed	13 (4.0%)	3 (23.1%)	10 (76.9%)	
Fishmonger/ Fish farmer	60 (18.6%)	27 (45.0%)	33 (55.0%)	
Farmer	53 (16.5%)	20 (37.7%)	33 (62.3%)	
Petty trader	38 (11.8%)	19 (50.0%)	19 (50.0%)	
Salaried worker (Public)	31 (9.6%)	11 (35.5%)	20 (64.5%)	
Salaried worker (Private)	62 (19.3%)	30 (48.4%)	32 (51.6%)	
Others	65 (20.2%)	19 (29.2%)	46 (70.8%)	
Partner's religion				0.042*
Christian	312 (78.0%)	120 (38.5%)	192 (61.5%)	
Muslim	17 (4.2%)	11 (64.7%)	6 (35.3%)	
Traditionalist	51 (12.8%)	24 (47.1%)	27 (52.9%)	
Others	20 (5.0%)	4 (20.0%)	16 (80.0%)	
Partner's Past Relationship				<0.001**
Married before present relationship	124 (31.0%)	32 (25.8%)	92 (74.2%)	
No previous marital relationship	269 (67.3%)	124 (46.1%)	145 (53.9%)	
No knowledge of partner's past relationship	7 (1.8%)	3 (42.9%)	4 (57.1%)	

Table 2B: Information of Respondents' Partners by their Interpregnancy Interval (IPI) Status (Continued)

Table 2.2: Information of Respondents' Partners and their Relationship with their Interpregnancy Interval (IPI) Status (Continued)

CHARACTERISTICS OF THE SPOUSE OF RESPONDENTS, n = 400	Total, n (%)	Interpregnancy Interval (IPI) Status		Chi square ([a]Fisher exact test) p-value
		Short IPI, n (%)	Long IPI, n (%)	
Does partner has any child outside this relationship?				<0.001**
Yes	138 (34.5%)	37 (26.8%)	101 (73.2%)	
No	262 (65.5%)	122 (46.6%)	140 (53.4%)	
Duration of relationship with partner (years)				0.001*
1 – 5	200 (50.0%)	84 (42.0%)	116 (58.0%)	
6 – 10	124 (31.0%)	59 (47.6%)	65 (52.4%)	
+ 10	76 (19.0%)	16 (21.1%)	60 (78.9%)	
Does partner has another wife / partner beside respondent				0.001*
Yes	85 (21.3%)	20 (23.5%)	65 (76.5%)	
No	315 (78.7%)	139 (44.1%)	176 (55.9%)	
Who decided the timing of the current pregnancy? n = 400				< 0.001**
Man (Husband)	49 (12.3%)	7 (14.3%)	42 (85.7%)	
Woman (Wife)	14 (3.5%)	4 (28.6%)	10 (71.4%)	
Both (Shared decision)	159 (39.8%)	55 (34.6%)	104 (65.4%)	
Undecided	178 (44.5%)	93 (52.2%)	85 (47.8%)	

Source: Survey Data, January – February, 2017

Note: (*) for statistically significant variable when p-value < 0.05 and (**) for statistically significant variable when p-value < 0.001. [a]Fisher's exact test is applied when an expected frequency < 2.

4.4 Present and Past Obstetric Characteristics of Respondents

The results from the study showed that 39.75% of the respondents that presented at the antenatal clinic (ANC) of the three District Hospitals during the study period waited for less than 24 months after their last delivery before conceiving their current pregnancies (Table 3.2).

The results further showed that majority (51%) of the respondents were in their third trimester. Also, 57.4% of those respondents in the third trimester had a long IPI status. There was no statistically significant association between IPI status of respondent and the level of the trimester of their current pregnancy (Table 3.1).

Most (58%) of the respondents had carried between 1 – 3 number of pregnancies and the proportion of respondents with long IPI as against those with short IPI widens as the number of pregnancies carried (gravidity) increases. About 89% and 74% of the respondents had never lost a child after delivery nor had experienced miscarriage / abortion respectively. There was no association between gravidity and the IPI status of the respondent while a past history of miscarriage/ abortion and the experience of losing a child after live birth had a statistically significant association with IPI status (Table 3.1).

Majority (67.4%) of the respondents who practiced exclusive breastfeeding after their last delivery had a long IPI status while exactly half of those who did not practiced exclusive breastfeeding experienced short IPI. The practice of exclusive breastfeeding after last delivery among respondents had an association with their IPI status (Table 3.1).

The study showed that most (86.3%) of the respondents delivered their last child through normal delivery. Majority of those who delivered their last child by either normal delivery or caesarean section all had long IPI status. There was no association between the mode of delivery of the last child and the IPI status of the respondents (Table 3.1)

Our findings again showed that 69.2% of the respondents had a previous knowledge of birth spacing for at least 24 months. There was an association between this knowledge among respondents and their IPI status.

According to the results, majority (46%) of the respondent described their current pregnancy as one that was wanted and the timing was right and was followed (35.8%) by those who neither wanted nor expected their current pregnancy to occur. The relationship between respondents' perception of the timing of their current pregnancy and their IPI status was statistically significant (Table 3.2).

Table 3.1: Information of Current pregnancy and Past Obstetric Characteristics against Interpregnancy Interval Status of Respondents

RESPONDENT'S OBSTETRIC CHARACTERISTICS, n =400	Total, n (%)	Interpregnancy Interval (IPI) Status		Chi square (a Fisher exact test) p-value
		Short IPI, n (%)	Long IPI, n (%)	
Trimester of current pregnancy				0.493
First	41 (10.3%)	15 (36.6%)	26 (63.4%)	
Second	155 (38.8%)	57 (36.8%)	98 (63.2%)	
Third	204 (51.0%)	87 (42.6%)	117 (57.4%)	
Age of last child (months)				<0.001**
0 - 24	116 (29.0%)	116 (100%)	0 (0.0%)	
25 - 60	237 (59.3%)	43 (18.1%)	194 (81.9%)	
61 - 150	47 (11.8%)	0 (0.0%)	47 (100%)	
Number of pregnancies carried (Gravidity)				0.073
1 - 3	232 (58.5%)	103 (44.4%)	129 (55.6%)	
4 - 6	150 (37.5%)	51 (34.0%)	99 (66.0%)	
+ 6	18 (4.0%)	5 (27.8%)	13 (72.2%)	
Mode of delivery of last child				0.558
Normal delivery	345 (86.3%)	134 (38.8%)	211 (61.2%)	
Instrumental delivery	12 (3.0%)	6 (50.0%)	6 (50.0%)	
Caesarean section	43 (10.8%)	19 (44.2%)	24 (55.8%)	
Exclusive breastfeeding practiced after last delivery				0.001*
No	164 (41.0%)	82 (50.0%)	82 (50.0%)	
Yes	236 (59.0%)	77 (32.6%)	241 (67.4%)	
Ever had miscarriage/ abortion?				0.021*
No	294 (73.5%)	127 (43.2%)	167 (56.8%)	
Yes	106 (26.5%)	32 (30.2%)	74 (69.8%)	
Ever lost a child after delivery (n =399)				0.327
No	355 (88.8%)	144 (40.6%)	211 (59.4%)	
Yes	44 (11.0%)	14 (31.8%)	30 (68.2%)	

Source: Survey Data, January – February, 2017

Table 3.2: Information of Current pregnancy and Past Obstetric Characteristics against Interpregnancy Interval Status of Respondents (Continued)

RESPONDENT'S OBSTETRIC CHARACTERISTICS, n =400	Total, n = 400 (%)	Interpregnancy Interval (IPI) Status		Chi square ([a]Fisher exact test) p-value
		Short IPI, n (%)	Long IPI, n (%)	
Description of how current pregnancy occurred				0.013*
Wanted and at the right time	184 (46.0%)	59 (32.1%)	125 (67.9%)	
Wanted but not at the right	73 (18.3%)	32 (43.8%)	41 (56.2%)	
Not wanted and unexpected	143 (35.8%)	68 (47.6%)	75 (52.4%)	
Knowledge about birth spacing of at least 24 months				<0.001**
No	123 (30.8%)	71 (57.7%)	52 (42.3%)	
Yes	277 (69.2%)	87 (31.4%)	190 (68.6%)	
Always successful in preventing pregnancy in the past				<0.001**
No	142 (35.5%)	81 (57.0%)	61 (43.0%)	
Yes	258 (64.5%)	78 (30.2%)	180 (69.8%)	
IPI Status of Respondents				
Calculated IPI	400 (100%)	159 (39.75%)	241 (60.25%)	
Mean IPI (SD) = 35 (±25) months				
Median IPI = 28 months				

Source: Survey Data, January – February, 2017

Note: (*) for statistically significant variable when p-value < 0.05 and (**) for statistically significant variable when p-value < 0.001. [a]Fisher's exact test is applied when an expected frequency < 2.

4.5 Respondent's Acceptability of Postpartum Family Planning

The acceptability of postpartum family planning by respondents was assessed with characteristics such as: respondents' acceptability of avoiding pregnancy with postpartum family planning, partners of respondents' acceptability of avoiding pregnancy with modern family planning, the need for seeking permission from partners before using modern family planning, the decision to use family planning without the knowledge of partners and lastly whether respondents' mother, mother in-law and father in-law accept their use of modern family planning as means of avoiding pregnancies.

With the exception of the acceptability to the use of modern family planning by respondents' mother in-law and father in-law, all the above characteristics of respondents had a statistically significant association with their IPI status as is shown in Table 4.

According to the results, majority (75.0%) of the respondent accepted that they would avoid pregnancy by using postpartum family planning. Most (65.3%) of these category of respondents had a long IPI status compared to those who did not accept the use of postpartum family planning as a means of avoiding pregnancy.

The results also showed that most (51%) of the pregnant women who were interviewed responded that their partners would agree to their use of modern family planning as means of avoiding pregnancy. The respondents who said that their partners would not agree to their use of modern family planning mostly (58.2%) had short IPI status as compared to those who said their partners would not object who mostly (65.3%) had a long IPI status (Table 4).

The study found that majority (67.3%) of the respondents would need permission from their spouse before using the modern family planning. Compared to those who would not need spousal permission before using PPFP, majority (64.7%) of those who would need spousal permission had a long IPI status.

Again, the study showed that majority (52.8%) of respondents do not accept the use of modern family planning without the knowledge of their spouse and most (54.0%) of these women had long IPI status.

The results also showed that most of the respondents were not sure of whether their external family (including mother, mother in-law and father in-law) would accept their decision to use modern family planning as a means of avoiding unexpected pregnancies (Table 4).

Table 4: Respondent's Interpregnancy Interval Status against their Acceptability of Postpartum Family Planning

ACCEPTABILITY OF POSTPARTUM FAMILY PLANNING USAGE, n = 400	Total, n (%)	Interpregnancy Interval (IPI) Status		Chi square ([a]Fisher exact test) p-value
		Short IPI, n (%)	Long IPI, n (%)	
Do you accept to avoiding pregnancy by using postpartum family planning				0.001*
No	67 (16.8%)	39 (58.2%)	28(41.8%)	
Yes	300 (75.0%)	104 (34.7%)	196 (65.3%)	
Not sure	33 (8.2%)	16 (48.5%)	17 (51.5%)	
Partner's acceptance of avoiding pregnancy with modern family planning,				<0.001**
No	113 (28.3%)	64 (56.6%)	49 (43.4%)	
Yes	204 (51.0%)	62 (30.4%)	142 (69.6%)	
Not sure	83 (20.7%)	33 (39.8%)	50 (60.2%)	
Need for partner's permission before using modern family planning				0.01*
No	81 (20.3%)	44 (54.3%)	37 (45.7%)	
Yes	269 (67.3%)	95 (35.3%)	174 (64.7%)	
Not sure	50 (12.4%)	20 (40.0%)	30 (60.0%)	
Do you accept to use family planning secretly without partner's knowledge?				0.006*
No	211 (52.8%)	97 (46.0%)	114 (54.0%)	
Yes	146 (36.4%)	43 (29.5%)	103 (70.5%)	
Not sure	43 (10.8%)	19 (44.2%)	24(55.8%)	
Does your mother accept your use of family planning?				0.021*
No	103 (25.8%)	39 (37.9%)	64 (62.1%)	
Yes	127 (31.8%)	40 (31.5%)	87 (68.5%)	
Not sure	170 (42.4%)	80 (47.0%)	90 (52.9%)	
Does your mother in-law accept your use of family planning?				0.256
No	103 (25.8%)	42 (40.8%)	61 (59.2%)	
Yes	103 (25.8%)	34 (33.0%)	69 (67.0%)	
Not sure	194 (48.4%)	83 (42.8%)	111 (57.2%)	
Does your father in-law accept your use of family planning?				0.079
No	96 (24.0%)	38 (39.6%)	58 (60.4%)	
Yes	87 (21.8%)	26 (29.9%)	61 (70.1%)	
Not sure	217 (54.2%)	95 (43.8%)	122 (56.2%)	

4.6 Respondent's Past Experience and their Intention to Use Postpartum Family Planning

From the study, few (34%) of the respondents had used postpartum family planning (PPFP) after their last delivery. Among those who used PPFP, majority (78.7%) had long IPI status compared to those who failed to use (50.8%). There was an association between respondents' IPI status and usage of PPFP after last delivery.

As is shown in table 5.2, injectable (for every one to three months) was the most widely used PPFP method (66.9%) by respondents followed by pill (14.0%).

Among the respondents who were willing to give birth again, most (24.1%) of them preferred to wait for at least two years before getting pregnant followed by those who chose three years. Those respondents who preferred to wait for two years had a high proportion of short IPI status (55.6%) compared to those who preferred to wait for three years and as is shown in Table 5.1.

About 50% of the respondents intend to avoid getting pregnant too soon after delivery by adopting a family planning method; this is followed by those (25%) who prefer to insist on condom use by their spouse as means to avoid getting pregnant. Most (70.2%) of the former group of respondents had long IPI status compared to the latter group who mostly (51%) had short IPI status.

The most (36.7%) preferred PPFP method to be used by respondents after delivery was injectable (every one to three months) followed by implant (17%) (Table 5.1).

Lastly, the results showed that majority (38.3%) of non-users of PPFP intend to adopt family planning after delivery followed by those (34.5%) who intend to insist that their partners use

condom. Among the users of PPFP, an even more greater number (71.3%) intend to adopt modern family planning method as means of avoid unintended pregnancies (Table 5.3).

Table 5.1: Respondent's Interpregnancy Interval Status against their Intentions to Use and Past Experience of Postpartum Family Planning

POSTPARTUM FAMILY INTENTIONS AND PAST EXPERIENCE	Total, n (%)	Interpregnancy Interval (IPI) Status		Chi square ([a]Fisher exact test) p-value
		Short IPI, n (%)	Long IPI, n (%)	
Length of time respondent prefers to wait before getting pregnant again, n = 374				
No more children	138 (36.9%)	44 (31.9%)	94 (68.1%)	0.018*
One year	1 (0.3%)	0 (0.0%)	1 (100.0%)	
Two years	90 (24.1%)	50 (55.6%)	40 (44.4%)	
Three years	66 (17.6%)	25 (37.9%)	41 (62.1%)	
Four years	50 (13.3%)	17 (34.0%)	33(66.0%)	
Above four years	29 (7.8%)	13 (44.8%)	16 (55.2%)	
Main plan to avoid getting pregnant too soon after delivery, n = 400				
Avoiding sex	30 (7.5%)	15 (50.0%)	15 (50.0%)	0.002*
Insisting on condom use by partner	100 (25.0%)	51 (51.0%)	49 (49.0%)	
Having sex only during safe period	58 (14.5%)	29 (50.0%)	29 (50.0%)	
Adopting a family planning method	198 (49.5%)	59 (29.8%)	139 (70.2%)	
Other means	14 (3.5%)	5 (35.7%)	9 (64.3%)	
Preferred family planning method to use after delivery, n = 400				
Exclusive breastfeeding	23 (5.8%)	11 (47.8%)	12 (52.2%)	
Condom use by partner	36 (9.0%)	19 (52.8%)	17 (47.2%)	0.111
Rhythm	31 (7.8%)	17 (54.8%)	14 (45.2%)	
Pill (morning - morning)	23 (5.7%)	8 (34.8%)	15 (65.2%)	
Injectables (every one to three months)	147 (36.7%)	61 (41.5%)	86 (58.5%)	
I.U.D	8 (2.0%)	2 (25.0%)	6 (75.0%)	
Implant (long term)	68 (17.0%)	24 (35.3%)	44 (64.7%)	
Sterilization (Permanent)	36 (9.0%)	11 (30.6%)	25 (69.4%)	
None of the methods	28 (7.0%)	6 (22.2%)	22 (77.8%)	

Source: Survey Data, January – February, 2017

Note: (*) for statistically significant variable when p-value < 0.05 and (**) for statistically significant variable when p-value < 0.001. [a]Fisher's exact test is applied when an expected frequency < 2.

Table 5.2: Respondent's Interpregnancy Interval Status against their Intentions to Use and Past Experience of Postpartum Family Planning (Continued)

POSTPARTUM FAMILY INTENTIONS AND PAST EXPERIENCE	Total, n (%)	Interpregnancy Interval (IPI) Status		Chi square ([a]Fisher exact test) p-value
		Short IPI, n (%)	Long IPI, n (%)	
Did you use family planning after last delivery? n = 400				**<0.001****
Yes	136 (34.0%)	29 (21.3%)	107 (78.7%)	
No	264 (66.0%)	130 (49.2%)	134 (50.8%)	
Family planning method used after last delivery, n = 136				
Exclusive breastfeeding	4 (2.9%)	3 (75.0%)	1 (25.0%)	0.056
Condom use by partner	2 (1.5%)	1(50.0%)	1 (50.0%)	
Rhythm	6 (4.4%)	2 (33.3%)	4 (66.7%)	
Pill (morning - morning)	19 (14.0%)	2 (10.5%)	17 (89.5%)	
Injectables (every one to three months)	91 (66.9%)	18 (19.8%)	73 (80.3%)	
I.U.D	3 (2.2%)	0 (0.0%)	3 (100.0%)	
Implant (long term)	9 (6.6%)	1 (11.1%)	8 (88.9%)	
Sterilization (Permanent)	1 (0.75%)	0 (0.0%)	1 (100.0%)	
Emergency contraception	1 (0.75%)	1 (100.0%)	0 (0.0%)	

Source: Survey Data, January – February, 2017

Note: (*) for statistically significant variable when p-value < 0.05 and (**) for statistically significant variable when p-value < 0.001. [a]Fisher's exact test is applied when an expected frequency < 2.

Table 5.3: Relationship between Users/ Non-Users of Family Planning and Future Intentions to Use Family Planning

Plan to Avoid Pregnancy after Delivery	Total, n (%)	Family Planning Use after Last Delivery		p - value = < 0.001
		Yes, n = 136(34%)	No, n = 264(66%)	
Adopting a family planning method	198 (49.5%)	97 (71.3%)	101 (38.3.0%)	
Having sex only during safe period	58 (14.5%)	15 (11.0%)	43 (16.3%)	
Insisting on condom use by partner	100 (25.0%)	9 (6.6%)	91 (34.5%)	
Avoiding sex	30 (7.5%)	8 (5.9%)	22 (8.3%)	
Other means	14 (3.5%)	7 (5.1%)	7 (0.4%)	

4.7 Multivariate Analysis of the Factors Influencing Interpregnancy Intervals of Respondents

In the bivariate analyses to determine association between the interpregnancy interval (IPI) status of respondents and factors influencing their occurrence, several of these factors had a statistically significant association with the outcome variable.

After regressing IPI status of respondents and all the factors that demonstrated statistically significant association during the bivariate analysis, controlling for confounders, some of factors did not retain their statistical significance as their adjusted odd ratio passed through the null. The factors that did not retain their statistical significance included: age of respondent's partner, educational status of respondent, employment status of respondent, partner's religion, partner's past relationship, the presence/ absence of a step child, the presence/ absence of another partner beside respondent, the practice of exclusive breastfeeding after last delivery and respondent experience of miscarriage/ abortion. The rest of the above factors included: acceptability of avoiding pregnancy by using modern family planning by the respondent or the respondent's spouse and other external relatives, the length of time respondent intends to wait before conceiving again and lastly the respondent's preferred PPFP after delivery of this pregnancy.

The respondent characteristics that retained their statistical significance after the multivariate analysis included: age of respondent, their socio-economic status, respondents, description of the timing of their last pregnancy, the person (s) who decided the timing of the current pregnancy and whether respondents used PPFP after their last delivery.

The results showed that the odds of experiencing a long IPI was about 1.12 times (aOR = 1.12, 95% CI 1.023 – 1.219) in older respondents compared to the younger ones as is shown in Table 6.1. The adjusted odd ratio was statistically significant as it did not pass through the null and the confidence interval was narrow indicating interval validity.

The multivariate analysis again showed that the odds of experiencing a long IPI was about 2-folds (aOR = 2.00, 95% CI 1.027 - 3.904) in respondents who had a middle level socio-economic status and about 5-folds (aOR = 5.07, 95% CI 1.256 - 20.505) in respondents who had a high level socio-economic status compared to those who had low socio-economic status. Both adjusted odds ratios did not pass though the null but confidence interval for the middle level socio-economic status was narrow while that for high level socio-economic status was wider affecting latter's internal validity (Table 6.1).

Respondents who described their pregnancy and the timing of their pregnancy as one that was wanted and expected had about 5-folds (aOR = 4.51, 95% CI 1.826 - 11.214) odds of experiencing long IPI compared to those who described their pregnancy as unwanted and mistimed as is shown in Table 6.2.

The results showed that respondents whose current pregnancy timings were decided by their husbands were about 6 times more likely (aOR = 5.82, 95% CI 1.770 - 19.149) to experience long IPI status compared to those whose timings were undecided/ unintended (Table 6.4).

Analyzing the importance of PPFP in preventing short IPI, the multivariate analysis showed that the odds of experiencing a long IPI status is about 3-folds (aOR = 2.55 1.291 - 5.042) in

respondents who used modern family planning after their last delivery compared to those who did not as is shown in Table 6.3.

Table 6.1: Factors Influencing Interpregnancy Intervals of respondents from Multiple Logistic Regression

Respondent Characteristics	Crude Odd ratio (cOR) (95% CI)	Adjusted Odd Ratio (aOR) (95% CI)
Age of Respondent	1.12 (1.077 – 1.174)	1.12 (1.023 - 1.219)*
Age of Respondent's Partner	1.06 (1.023 – 1.088)	0.99 (0.929 - 1.047)
Duration of relationship with partner (years)	1.08 (1.030 – 1.126)	1.07 (0.985 - 1.154)
Educational status		
Primary/ Elementary	1.64 (0.886 – 3.027)	0.57 (0.225 - 1.458)
Middle school/ Junior High	2.12 (1.185 – 3.795)	1.12 (0.441 - 2.829)
Senior High/ Vocational	0.77 (0.394 – 1.496)	0.63 (0.222 - 1.771)
Tertiary/ Polytechnic	1.02 (0.372 – 2.812)	0.52 (0.071 - 3.776)
No formal education (r)	1	1
Employment status		
Unemployed (r)	1	1
Fishmonger/ Fish farmer	0.60 (0.279 – 1.287)	0.37 (0.114 - 1.202)
Farmer	4.54 (1.410 – 14.619	1.69 (0.287 - 9.996)
Petty trader	1.37 (0.779 – 2.404)	0.74 (0.329 - 1.666)
Salaried worker (Public)	0.69 (0.171 – 2.798)	0.96 (0.135 - 6.745)
Salaried worker (Private)	1.30 (0.416 – 4.041)	0.19 (0.021 - 1.637)
Others	2.09 (1.026 – 4.275)	0.67 (0.240 - 1.889)
Socio-economic Status		
Low (r)	1	1
Middle	2.06 (1.308 – 3.229)	2.00 (1.027 - 3.904)*
High	1.53 (0.680 – 3.463)	5.07 (1.256 - 20.505)*

Source: Survey Data, January – February, 2017

Table 6.2: Factors Influencing Interpregnancy Interval of respondents from Multiple Logistic Regression

Respondent Characteristics	Crude Odd ratio (cOR) (95% CI)	Adjusted Odd Ratio (aOR) (95% CI)
Partner's Religion	0.95 (0.822 – 1.091)	0.89 (0.708 - 1.118)
Partner's Past Relationship		
Married before present relationship	2.46 (1.539 – 3.927)	1.22 (0.449 -3.325)
No previous marital relationship (r)	1	1
No knowledge of partner's past relationship	1.14 (0.250 – 5.193)	0.40 (0.026 - 6.142)
Does partner has any child outside this relationship?		
Yes	2.41 (1.536 – 3.776)	1.39 (0.527 - 3.666)
No (r)	1	1
Don't know	1.76 (0.318 – 9.806)	1.84 (0.122 - 27.708)
Does partner has another wife/ partner beside respondent		
Yes	2.56 (1.478 – 4.430)	1.62 (0.684 - 3.857)
No (r)	1	1
Don't know	0.787 (0.110 – 5.661)	0.36 (0.0236 - 5.586)
Exclusive breastfeeding practiced after last delivery		
No (r)	1	1
Yes	2.06 (1.370 – 3.114)	1.04 (0.504 - 2.136)
No breastfeeding	1	1.56 (0.053 - 45.344)
Ever had miscarriage/ abortion		
No (r)	1	1
Yes	1.76 (1.094 – 2.827)	1.14 (0.558 - 2.308)
Description of how current pregnancy occurred		
Wanted and at the right time	1.65 (0.948 – 2.884)	4.53 (1.826 - 11.214)*
Wanted but not at the right	0.86 (0.488 – 1.518)	1.22 (0.528 – 3.267)
Not wanted and unexpected (r)	1	1
Acceptability of avoiding pregnancy using postpartum family planning		
No (r)	1	1
Yes	2.63 (1.529 – 4.507)	1.31 (0.528 – 3.267)
Not sure	1.48 (0.640 – 3.420)	1.44 (0.398 -5.248)

Source: Survey Data, January – February, 2017

Table 6.3: Factors Influencing Interpregnancy Intervals of respondents from Multiple Logistic Regression

Respondent Characteristics	Crude Odd ratio (cOR) (95% CI)	Adjusted Odd Ratio (aOR) (95% CI)
Partner's acceptability of avoiding with modern family planning		
No (r)	1	1
Yes	2.99 (1.857 – 4.819)	1.18 (0.484 - 2.893)
Not sure	1.98 (1.113 – 3.520)	2.23 (0.794 - 6.252)
Need for partner's permission before using modern family planning		
No (r)	1	1
Yes	2.18 (1.316 – 3.604)	1.55 (0.637 - 3.752)
Not sure	1.78 (0.873 – 3.646)	2.26 (0.627 - 8.120)
Accept to use family planning secretly without partner's knowledge		
No (r)	1	1
Yes	2.04 (1.303 – 3.187)	1.12 (0.561 - 2.221)
Not sure	1.07 (0.556 – 2.080)	0.68 (0.229 - 2.00)
Does your mother accept your use of family planning		
No (r)	1	1
Yes	1.33 (0.767 – 2.289)	0.97 (0.404 - 2.3334
Not sure	0.69 (0.416 – 1.129)	0.86 (0.382 - 1.917)
Did you use family planning after last delivery?		
Yes	3.58 (2.224 – 5.762)	2.55 (1.291 - 5.042)*
No (r)	1	1
Length of time respondent intends to wait before getting pregnant again		
No more children	2.67 (1.543 – 4.622)	0.98 (0.387 - 2.496)
One year	1	1
Two years	1	1
Three years	2.05 (1.072 – 3.920)	1.47 (0.588 - 3.688)
Four years	2.43 (1.184 – 4.974)	1.03 (0.334 - 3.188)
Above four years	1.54 (0.663 – 3.570)	0.948 (0.237 - 3.786)

Source: Survey Data, January – February, 2017

Table 6.4: Factors Influencing Interpregnancy Intervals of respondents from Multiple Logistic Regression

Respondent Characteristics	Crude Odd ratio (cOR) (95% CI)	Adjusted Odd Ratio aOR (95% CI)
Main plan to avoid getting pregnant too soon after delivery		
Avoiding sex (r)	1	1
Insisting on condom use by partner	0.96 (0.425 – 2.415	1.03 (0.292 - 3.610)
Having sex only during safe period	1	1.03 (0.311 - 3.390)
Adopting a family planning method	2.36 (1.082 – 5.128)	0.97 (0.281 - 3.356)
Other means	1.8 (0.487 – 6.649)	0.61 (0.101 - 3.616)
Who decided the timing of this current pregnancy		
Man (Husband)	6.56 (2.799 - 15.397)	5.82 (1.770 - 19.149)*
Woman (Wife)	2.74 (0.827 - 9.047)	1.27 (0.242 - 6.638)
Both (Shared decision)	2.07 (1.333 - 3.211)	0.95 (0.471 - 1.931)
Undecided (r)	1	1

Source: Survey Data, January – February, 2017

Notes: Asterix when confidence interval does not pass through the null, figures without asterix are not statistically significant; r = represents reference category; cOR (95% CI) = unadjusted odds ratio from simple logistics regression with a 95% confidence interval, aOR (95% CI) = adjusted odds ratio from a multiple logistics regression (all variables were included in the model).

CHAPTER FIVE

5.0 DISCUSSION

5.1 Introduction

This chapter discusses the key findings of the results of this survey which was conducted among pregnant women, with at least a previous live birth, who presented at the Antenatal Clinic (ANC) of Keta, Ketu-South and Akatsi-South District Hospitals during the period of January 2017 and February 2017. The study sought to determine factors influencing interpreganancy interval (IPI) among 400 respondents who were conveniently selected and interviewed with a structured questionnaire which was adapted from the 2014 GDHS and the questionnaire used in the Eliason et al. (2013) study.

5.2 Socio-Demographic Factors that Influence Interpregnancy Intervals

Evidences from different studies have stressed the role of socio-demographic characteristics, among other factors, in influencing birth intervals among women (Singh et al., 2010; Yohannes et al., 2011).

An important determinant of IPI among women is their age. The multivariate analysis demonstrated retention of the statistically significant association between IPI and maternal age obtained through the bivariate analysis. This shows a true relationship between the two variables devoid of bias due to confounders. It was revealed from the results that the odds of experiencing

a long IPI was about 1.12 times (aOR = 1.12, 95% CI 1.023 – 1.219) in respondents who had higher age compared to those with lower age as is shown in Table 6.1. Though the association was weak, the adjusted odd ratio was statistically significant as it did not pass through the null and the confidence interval was narrow indicating interval validity.

The association between maternal age and IPI is consistent with a study in Uganda, among others studies, that showed that young mothers in developing countries were more likely to have short IPIs compared to the older ones (Namkee and Shariff, 1994; Desta and Teklemariam, 2016). Research has shown that the recovery of ovarian function is faster among young mothers than older mothers and may be an important determinant of short IPIs among young mothers (Moran et al, 1994). However, some studies have also shown that older mothers were more likely to have a shorter interval so that they can quickly complete their family size (Kaharuza, 2001; Owonikoko et al., 2015).

The results of this study showed that maternal education has no association with an increased risk of short IPI as the multivariate analysis revealed that the observed association of education and IPI in the bivariate analysis was due to the presence of confounder(s). Some studies have shown that low maternal education is significantly associated with short IPI while others showed no relationship between maternal education and short IPI (Kaharuza, 2001). The study in Uganda showed no association between short IPI and education status which is consistent with our study. (Namkee and Shariff, 1994).

Studies from both developing and developed countries have consistently shown association between low socio-economic status (SES) and short IPI.(Abebe and Yohannis, 1996; Klerman et

al., 1998; Duncan et al., 1997). Given the difficulties in the collection of income and expenditure data in determining the SES of respondents, assessment of the ownership of household and personal assets of respondents with weighting of each of these items based on the eigenvalues from principal component analysis is one of the most effective means of evaluating SES (Manortey et al., 2014). This approach was employed in this study and the multivariate analysis showed that the odds of experiencing a long IPI was about 2-folds (aOR = 2.00, 95% CI 1.027 - 3.904) in respondents who had a middle level socio-economic status and about 5-folds (aOR = 5.07, 95% CI 1.256 - 20.505) in respondents who had a high level socio-economic status compared to those who had low socio-economic status (Table 6.1).

Some other socio-economic characteristics that were studied found no association with respondent's IPI status and they included: educational status, employment status, area of residence (whether urban, semi-urban or rural), marital status and religion. These findings disagree with studies that have shown female education (Abdel-Fattah et al., 2007; Youssef, 2005), respondent's occupational status (Begna et al., 2013) and area of residence of respondents (Yohannes et al., 2011) as strong predictors of birth intervals.

5.3 The Role of Spouses in Influencing Interpregnancy Intervals of their Partners

The bivariate analysis of the survey showed that there were statistically significant associations between interpregnancy interval of respondents and some of the characteristics of their spouse. These characteristics included the spousal age, occupational status, past marital relationship (i.e. whether their partner had ever married before the current relationship), how long they have been

in relationship with the current spouse and whether their spouse has a child or another partner outside the current relationship.

After further analytical work that was performed by regressing IPI status against all the statistically significant respondent's characteristics obtained through the bivariate analysis, almost all of the above characteristics lost their statistically significant association. This could imply that the earlier observed relationships between IPI status and spousal influences were partly due to confounders.

The only spousal characteristics which showed a statistically significant relationship from the multivariate analysis was the spousal influence in deciding the timing of the respondent's current pregnancy. The analysis revealed that respondents whose current pregnancy timings were decided by their husbands were about 6 times more likely (aOR = 5.82, 95% CI 1.770 - 19.149) to conceive after waiting for at least 24 months, as recommended by WHO (WHO, 2007), compared to those whose timings were undecided/ unintended (Table 6.4). According to Eliason et al. (2013) similar studies in Sub-Saharan Africa have pointed to the critical role played by male partners in the family planning decision-making process of women. The finding in this study demonstrate how critical it is to involve male partners in assisting a woman to regulate the desired timing of her next pregnancy through the use of appropriate postpartum family planning method.

5.4 The Influence of Obstetric History of Respondents and their Interpregnancy intervals

The results from the study showed that 39.75% of the respondents that presented at the antenatal clinic (ANC) of the three District Hospitals during the study period could not wait for at least 24 months after their last delivery before conceiving their current pregnancies. This prevalence among the respondents is slightly higher than the national prevalence which was contained in the Maternal and Child Health Integrated Program (MCHIP) report in 2014 which analyzed the 2008 GDHS data concerning birth spacing. The report showed that 2% of pregnancies in Ghana occur within very short intervals of less than 6 months, 9% within short intervals of less than 12 months, and another 28% within intervals of 12 – 23 months which culminates into a prevalence of 36% of all non-first births which is less than the WHO (2007) recommended 24-month IPI (MCHIP and MCSP report, 2015). According to Kaharuza (2001), though different cut off points are used in most researches in developed countries, the prevalence of short birth intervals in developed countries ranges from 5 – 30%.

The bivariate analysis demonstrated statistically significant association between IPI status and some obstetric characteristics such as respondent's gravidity practice of exclusive breastfeeding after last delivery (index child), history of miscarriage/ abortion, previous knowledge of spacing of births for at least 24 months and a history of loss of a child and the description of the timing of the current pregnancy. The only obstetric characteristic that did not show association with IPI status from the bivariate analysis was the mode of delivery of last of last pregnancy.

In the multivariate logistic regression, controlling for all the statistically significant variables as confounders, the only obstetric characteristics which retained its statistical significance was the

respondents' description of the timing of their current pregnancy as the adjusted odd ratios of one of the sub-variables passed did not pass through the null (Table 6.2). This implied that the observed associations between IPI status and those obstetric characteristics were partly contributed to by confounders.

From the study, the respondents who described their pregnancy and the timing of their pregnancy as one that was wanted and expected had about 5-folds odds (aOR = 4.51, 95% CI 1.826 - 11.214) of experiencing long IPI compared to those who described their pregnancy and the timing of their pregnancy as unwanted and unexpected as is shown in Table 6.2. This is consistent with a study in Denmark regarding pregnancy planning, which indicated that respondents with planned pregnancies were more likely to have longer birth intervals than those who reported that their pregnancies occurred unintentionally (Kaharuza et al., 2001). Birth spacing is best achieved with the use of PPFP as the service supports longer birth interval or reduces unintended pregnancy and its attendant consequences. Studies conducted in countries like Bolivia, Egypt, Thailand and Kenya have all shown that forward-looking fertility preference significantly correlates with PPFP use except in Zambia where there was no correlation (Zerai and Tsui, 2001; Hotchkiss and Do, 2013).

This study further revealed that 35.8% of the respondents described the timing of their pregnancy as unwanted and mistimed. This is almost similar to what was captured in the Guttmacher Institute report (2013) on abortion in Ghana which showed that more than a third (37%) of all pregnancies in Ghana are unintended: 23% are mistimed and 14% are unwanted (Singh et al., 2009).

The above result is not consistent with studies that have demonstrated relationship between obstetric history of women and their IPIs. A study in Ogbomoso, located in South-West of Nigeria, showed significant relationship between IPI and respondents mode of delivery during their last pregnancy and practice of exclusive breastfeeding (Owonikoko et al., 2015). The weakness of the Owonikoko et al. study was that there was no multivariate analysis rule out the effect of confounders on the relationship as was done in our study.

5.5 Past Experience, Acceptability and Intentions of using Postpartum Family Planning in Future

The purpose of PPFP is to help women to decide on the contraceptive they want to use, to initiate that contraceptive, and to continue contraceptive use for 2 years or longer, depending on the reproductive intentions of woman or couple.

The acceptability of postpartum family planning by respondents was assessed with characteristics such as: respondents' acceptability of avoiding pregnancy with postpartum family planning, partners of respondents' acceptability of avoiding pregnancy with modern family planning, the need for seeking permission from partners before using modern family planning, the decision to use family planning without the knowledge of partners and lastly whether respondents' relations (including mother, mother in-law and father in-law) accept their use of modern family planning as means of avoiding pregnancies.

The bivariate analysis showed statistically significant association between respondent's IPI status and their acceptability of PPFP, the need for seeking permission from partners before using modern family planning and the decision to use family planning without the knowledge of partners with the exception of whether their mother in-law and father in-law accept their use of PPFP. Though the multivariate analysis revealed a non-statistical significance among the acceptability indicators, it is still important to mention that majority (75.0%) of the respondent accepted PPFP as means of avoiding unintended pregnancies and most (65.3%) of these category of respondents had a long IPI status compared to those that did not accept the use of postpartum family planning as a means of avoiding pregnancy who mostly had a short IPI status. This suggests that self-approval to PPFP use by respondents does not guarantee usage after delivery since it is affected by several other factors as multivariate analysis demonstrated that the observed bivariate association was partly contributed to by confounders.

The results also showed that most (51.0%) of the pregnant women who were interviewed responded that their partners would agree to their use of modern family planning as means of avoiding pregnancy and majority (67.3%) of the them responded that they would need permission from their spouse before using the modern family planning. Since the multivariate analysis demonstrated that respondents' whose PPFP decision were made by their husbands had a higher odds (aOR = 5.82, 95% CI 1.770 - 19.149) of waiting for at least 24 months before conceiving again, spousal acceptability was more important than personal approval in birth spacing. This finding is consistent with Eliason et al. (2013) who noted that personal conviction of women with regards to PPFP is superseded by their partners' approval. A study in Malawi

demonstrated that spousal communication on family planning led to men facilitating contraceptive use by their partner (Shattuck et al., 2011).

Women's intentions to use family planning have received attention as an alternative or supplement to information about unmet need (Roy et al., 2003). Ross and Winfrey (2001) observed that while unmet need rests on fertility preferences, statements of intentions to use family planning pertains to actual family planning use. This means that by expressing intention to practice contraception, women are able to better visualize their future need for family planning and therefore are more likely to translate it into actual use.

Respondents' intentions to use PPFP were assessed by asking questions about how long they intend to wait after delivery, how they intend to avoid getting pregnant soon after delivery and those who agreed to delay getting pregnant were asked the family planning method they intend to use.

There was no relationship between respondents' IPI and how long they intend to wait after delivery. The multivariate analysis however revealed that respondents who used modern family planning after their last delivery were about three times (aOR = 2.55, 95% CI 1.291 - 5.042) more likely to wait for at least 24 months before conceiving again (Table 6.3).

The cross-tabulation between intentions to use modern family planning in the future and user/ non-users of PPFP after the last delivery showed that majority (38.3%) of non-users intended to adopt PPFP after delivery followed by those who intend to avoid unintended pregnancies by insisting that their partners use condom. The former result is slightly greater than the results

obtained from the 2014 Ghana Demographic Health Survey (GDHS, 2014) which showed that 35.9% of non-users intend to use family planning after delivery.

The results also shows that respondents' who intend to use PPFP after delivery mostly (36.7%) prefer the use of injectable (from one to three months) as PPFP method followed by the insertion of implant (17.0%). Injectable (for every one to three months) was again the most widely used PPFP method (66.9%) by respondents who indicated that they used PPFP after their last delivery. This is consistent with the 2008 and 2014 GDHS which showed injectable as the most preferred method of contraception followed by pill (according to 2008 GDHS) and implant (according to 2014 GDHS).

5.6 Limitations

The results from this study should be viewed with consideration of some limitations. One limitation is the use of a convenient sampling in the recruitment of study participants who attended ANC during the study period. This design limitation was minimized by the calculation of sample size based on the National prevalence of short IPI and the use of multiple centers for the data collection with each study site offering number of study participants based on their monthly ANC client load.

Another limitation that threated the internal validity of the study was information bias. Information bias could have resulted from recall bias as result of difficulty in the provision of birth dates, mode of delivery and obstetric history. This bias was reduced by reducing the

number of such questions on the questionnaire; the use of the respondents' antenatal booklets as a source of reliable information in answering most of such objective questions; and asking them about information on recently ended pregnancy and current pregnancy. Another important bias that could have affected the quality of the data collected is the provision of socially desirable response by respondents to subjective questions. The limitations were reduced by the training of nurses and midwives as data collectors who could translate the questions into ewe for illiterate respondents. Furthermore, the use of interviewer-administered questionnaire ensured a uniform understanding of the questions by respondents.

Selection bias is a limitation to the external validity of this study as it affects the generalization of the findings beyond the study area and population. The study was conducted in only public health facilities which may not be reflective of private health facilities. The data was collected from only pregnant women that utilized ANC clinic leaving out those who don't. This limitation was minimized by the use of three Government Hospitals located in three Districts in the Volta Region of Ghana. The three Districts were chosen based on their development status as one was urban and the others were semi-rural and rural.

Again, only pregnant women were interviewed excluding non-pregnant mothers who may have long interval because they are subfecund or are using PPFP method as the use of only pregnant women may have overrepresented mothers with short IPI. Nevertheless, the prevalence of short IPI was almost similar to the National prevalence reported in the MCHIP report in 2014 which

analyzed the 2008 GDHS data concerning birth spacing. We therefore believe that selection bias was minimized in this study and the results are largely representative of the study population.

The researchers recommend that future research on this subject should measure both the preceding and subsequent IPIs for each respondent and a mean value determined or the two values compared as this could have given a better picture of the IPI status of the respondents. The preceding birth interval is the period between the previous pregnancy and the index child, while the subsequent interval is the period between the index child and the next pregnancy. This study utilized the latter period.

Future research should explore follow up of pregnant women to establish whether their PPFP intentions were met and how that affects subsequent IPI.

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATION

This chapter summarizes the key findings of the study in relation to the specific objectives and suggests recommendations to reduce unintended and unexpected pregnancies and their attendant consequences.

6.1 Conclusion

Interpregnancy interval among the study population in the three District Hospitals (in Keta, Ketu-South and Akatsi-South District in The Volta Region of Ghana) were independently predicted by maternal age, maternal socio-economic status, usage of PPFP after previous delivery, spousal approval of use of PPFP and the decision of respondents' IPI by their male partners.

6.2 Recommendation

Given the emphasis on promotion of family planning for purposes of birth spacing, the results of this study are very relevant to public health and population policy and therefore the researcher recommend a more robust study design in future to determine the factors influencing interpregnancy intervals.

Considering the finding of the importance of male involvement with the family planning uptake of their partners, the researcher recommend that PPFP providers could involve male partners in the decision-making process of PPFP and birth spacing through the inclusion of a mandatory session of couple counselling by health workers as part of the routine ANC of each pregnant woman.

The majority of work in FP in Ghana including the present study has been cross-sectional. Given the developmental priority the country places on FP and the need for an improved understanding of the dynamics of FP rejection, adoption, continuation and discontinuation, it is recommended that a state-commissioned cohort studies are conduced within the context of the work of the National Population Council.

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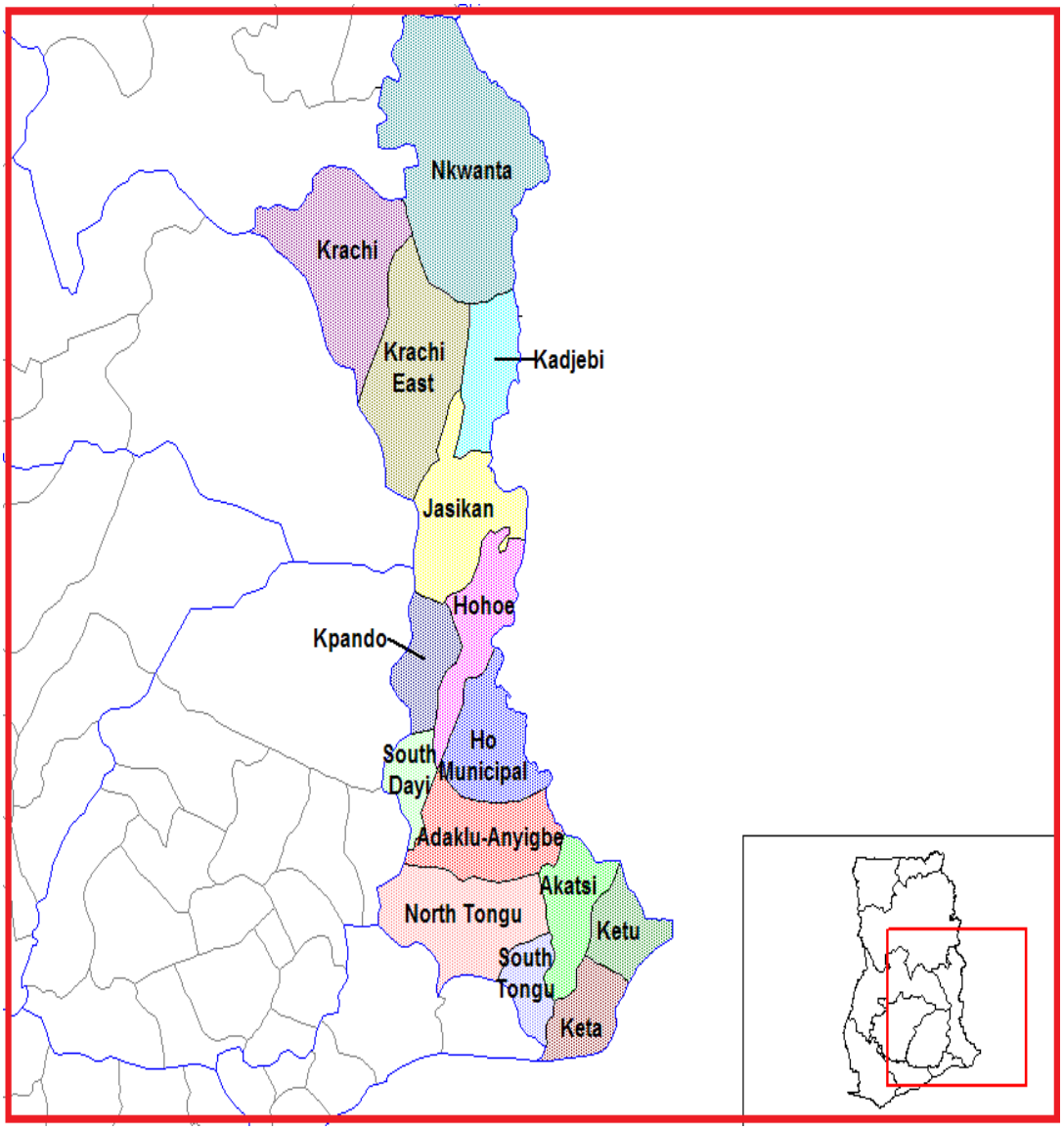
APPENDICES

I. Map of Volta Region Showing all the Districts



II. Questionnaire

A	**RESPONDENT BACKGROUND INFORMATIONS**	
1	Age (in years)	
2	Highest completed educational level	i. Primary ii. Middle/JSS iii. SSS/SHS/Vocational iv. Tertiary/Polytechnic v. No formal education
3	Ethnic group	i. Ewe ii. Akan iii. Ga iv. Others……
4	Religion	I. Christian II. Muslim III. Traditionalist IV. Other……..
5	Occupation	I. Unemployed II. Fishmonger/Fish farmer III. Farmer IV. Petty trader V. Salaried worker (Public) VI. Salaried worker (private) VII. Other……..
6	Number of children	
7	Area of residence (District/ Municipality)	I. Keta II. Aflao III. Akatsi IV. Others
8	Marital status	I. Married through church/mosque/court wedding, II. Married only by traditional rites III. Engaged, yet to be married IV. Co-habitation (living together) V. Divorced/Separated/Widowed VI. Single VII. Other:_____

B	CURRENT PARTNER (Responsible for current pregnancy) INFORMATION	
9	Age of partner?	
10	Highest completed educational level	I. Primary II. Middle/JSS III. SSS/SHS/Vocational IV. Tertiary/Polytechnic V. None
11	Ethnic group	I. Ewe II. Akan III. Ga IV. Other
12	Religion	I. Christian II. Muslim III. Traditionalist IV. Other
13	Occupation	I. Unemployed II. Fishmonger/Fish farmer III. Farmer IV. Petty trader V. Salaried worker (Public) VI. Salaried worker (private) VII. Other……..
14	Previously married before present relationship?	I. Yes II. No III. Don't know
15	Partner has any child beside those with you?	I. Yes II. No III. Don't know

C	RELATIONSHIP ISSUES	
16	Years of marriage or relationship with present partner	
17	Does your partner stay in the same house as you?	1. Yes 2. No
18	Does your husband/partner have another wife/spouse beside yourself?	1. Yes 2. No
19	Did your partner dominate in deciding whether / or not to use modern Family Planning after last delivery?	1. Yes 2. No 3. Shared decision
20	Who decided the timing of this pregnancy?	1. Man (husband) 2. Woman (Wife) 3. Both (shared decision) 4. Undecided 5. Other……

D	**ECONOMIC BACKGROUND**	
21	Does your household own any of the following? (*Read responses)*	I. Canoe / Fishing boat (1=Yes, 2=No) II. Fishing net (1=Yes, 2=No) III. Computer (1=Yes, 2=No) IV. Refrigerator (1=Yes, 2=No) V.Outboard motor (1=Yes, 2=No) VI. Radio (1=Yes, 2=No) VII.Television (1=Yes, 2=No) VIII.Mobile telephone (1=Yes, 2=No) IX. Own a House (1=Yes, 2=No) X. Bicycle / Motor cycle(1=Yes, 2=No) XI. Farm land (1=Yes, 2=No) XII. Car/ Truck(1=Yes, 2=No)
E	**REPRODUCTIVE (OBSTETRIC) HISTORY AND CURRENT PREGNANCY**	
22	How many months is this current pregnancy? (Extract from client ANC booklet)	
23	How old is your last child (if dead, how old will the child be by now)(in Age and exact months)? (Extract from client ANC booklet)	
24	What is the calculated IPI in months (i.e. the time interval between the current pregnancy and the previous live birth? (Extract from client ANC booklet)	(Leave this row. It will be estimated later)
25	How many times have you been pregnant? (Extract from client ANC booklet)	
26	What was the mode of delivery of your last baby?	I. Normal delivery II. Instrumental delivery III. C/S
27	Did you practice exclusive breastfeeding for your last baby?	I. Yes II. No III. No breastfeeding
28	Have any of your pregnancies ended in miscarriage or abortion?	I. Yes II. No
29	If YES, how many times?	*99 if not applicable*
30	How many children have you delivered?	
31	Have any of your children passed away?	1. Yes 2. No *99 if not applicable*
32	How would you describe how your present pregnancy happened?	*1. Wanted and at the right time,* *2. Wanted but not at the time it came* *3. Not wanted and unexpected*

F	**ACCEPTABILITY OF POST-PARTUM FAMILY PLANNING**	
33	Do you think it is acceptable for a woman to use family planning to avoid pregnancy after delivery?	1 Yes, 2.No 3. Not Sure
34	Do you think your partner will accept your use of a modern family planning method?	1 Yes 2.No 3. Not sure
35	Do you think you will need your partner's permission before you can use a modern family planning method?	1 Yes 2.No 3. Not Sure
36	If need be, would you use a family planning method without your partner knowing i.e. secretly?	1 Yes 2.No 3. Not Sure
37	Does any of the following think it is acceptable to use contraceptives to avoid pregnancy?	**Your mother** 1 Yes 2.No 3. Not sure **Your mother–in-law** 1 Yes 2.No 3. Not sure **Your father-in-law** 1 Yes 2.No 3. Not sure **Your religious leaders** 1 Yes 2.No 3. Not sure
G	**PAST EXPERIENCE WITH POST-PARTUM FAMILY PLANNING**	
38	Did you use family planning after your last delivery?	1. Yes 2. No 3. Not Sure
39	If yes to question 38: Which of these methods did you use to avoid getting pregnant after last delivery? (Mark √ for method used) *(Multiple answers allowed to indicates various approaches used in the past)*	I. Exclusive breastfeeding II. Condom by partner III. Rhythm IV. Pill (morning-morning) V. Injectables (every one to three months) VI. IUD VII. Implant (long term) VIII. Sterilization (permanent) IX. Emergency contraception *X.* Withdrawal *XI.* Others:…….
40	If yes to question 38: Who informed you about the method?	I. Health worker II. Partner III. Relative IV. Friend V. Internet VI. Television and radio VII. Others:……
41	If no to question 38: Why did you not use any contraception? (Respondent can tick more than one)	I. I wanted have a child II. I don't know about PPFP III. I did not think I could be pregnant IV. My religion forbids V. My partner objected to its use VI. I am afraid of side effects VII. I am afraid of becoming infertile VIII. Others
42	Do you know about spacing birth for at least 24 months?	I. Yes II. No

43	In the past, were you always successful in preventing pregnancy soon after delivery?	I. Yes II. No
H	**POST-PARTUM FAMILY PLANNING INTENTIONS**	
44	After this pregnancy, how long do you wish to wait before getting pregnant again?	i. One year ii. Two year iii. Three years iv. Four years v. No more children *vi.* Other
45	How do you plan (main way) to avoid getting pregnant too soon after delivery? *(Read out the options)*	I. Avoiding sex II. Insisting on condom use by partner III. Having sex only during safe period IV. Adopting a family planning method V. Other, specify:_____
46	If you wished to do family planning after delivery, which method would you prefer most	I. Exclusive breastfeeding II. Condom III. Rhythm IV. Pill (morning-morning) V. Injectables (every one to three months) VI. IUD VII. Implant (long term) VIII. Sterilization (permanent) IX. Emergency contraception *X.* None (will prefer not to use any FP)
47	Have you been counseled on using Family planning after delivery in this pregnancy?	I. Yes II. No III. No Sure
I	**POST-DELIVERY FOLLOW-UP**	
48	We wish to be able to follow you up to know if your post-delivery family planning intentions were actualized. Would you agree to be contacted?	1. Yes 2. No
49	If yes to Q48, can you describe where we can locate you? Telephone contact:…… DETAILED DESCRIPTION (Please be as detailed as possible)	

III. Informed Consent Form

SUBJECT NUMBER: ….....

PROJECT TITLE: FACTORS INFLUENCING INTERPREGNANCY INTERVALS AMONG PREGNANT WOMEN PRESENTING AT THREE DISTRICT HOSPITALS IN THE VOLTA REGION OF GHANA

BACKGROUND

Dear Participant, my name is Israel Abebrese Sefah. I am a student from Ensign College of Public Health, Kpong, Eastern Region. I am conducting a study on the "Factors Influencing Interpregnancy Intervals among Pregnant Women Presenting at Three District Hospitals in the Volta Region of Ghana".

PROCEDURES

The study will involve answering questions from a questionnaire regarding socio-demographic information, current partner information, spousal role in postpartum family planning decisions, reproductive history and respondent's acceptability, intention and past experience of postpartum family planning. This is purely an academic research that forms part of my work for the award of a Masters Degree.

BENEFITS

The results of this study would help inform policy-makers how to develop to interventions targeted at reducing incidence of short interpregnancy interval and its negative consequences and strategies to increase uptake of postpartum contraceptives and lastly to add to existing knowledge.

ANONYMITY AND CONFIDENTIALITY

I would like to assure you that whatever information you will provide will be handled with strict confidentiality and will be used purely for research purposes. Your responses will not be shared

with anybody who is not part of the study team. The data collected will be kept under key and lock.

RIGHT TO REFUSE

Participation in this study is voluntary and you can choose not to answer any individual question or all the questions. You are at liberty to withdraw from the study at any time. However, I will encourage you to fully participate since your opinions are important to help us to determine the factors that influence interpregnancy intervals and the use of postpartum family planning.

DISSEMINATION OF RESULTS

The results of this study will be mailed to you, if you provide your address below.

……

……

In case you need more information about the survey, you may contact me on this number 0209164151

COSTS AND/OR PAYMENTS TO SUBJECT FOR PARTICIPATION IN RESEARCH

There will be no costs for participating in the research. Also, you will not also be paid to participate in this research project.

CONSENT

I declare that the purpose, procedures as well as risks and benefits of the study have been thoroughly explained to me in a language I am comfortable with and I have understood.

I hereby agree to answer the questionnaire

Name of participant/respondent……..

Signature/Thumbprint of participant …….
Date……. / …… / ……..

INTERVIEWER'S STATEMENT:

I, the undersigned, have explained this consent form to the subject in a language that she understands and the subject has freely agreed to participate in the study.

Name of Interviewer:…….

Signature of interviewer: …….. ……..

Date: ……. / …….. / …….

Address …….

WITNESS' STATEMENT:

I, the undersigned, have witnessed the subject's willingness to participate in this study after due explanations given her.

Name of Witness:…….

Signature/Thumb Print of Witness: …….

Date: ……. / …….. / …….

Address …….