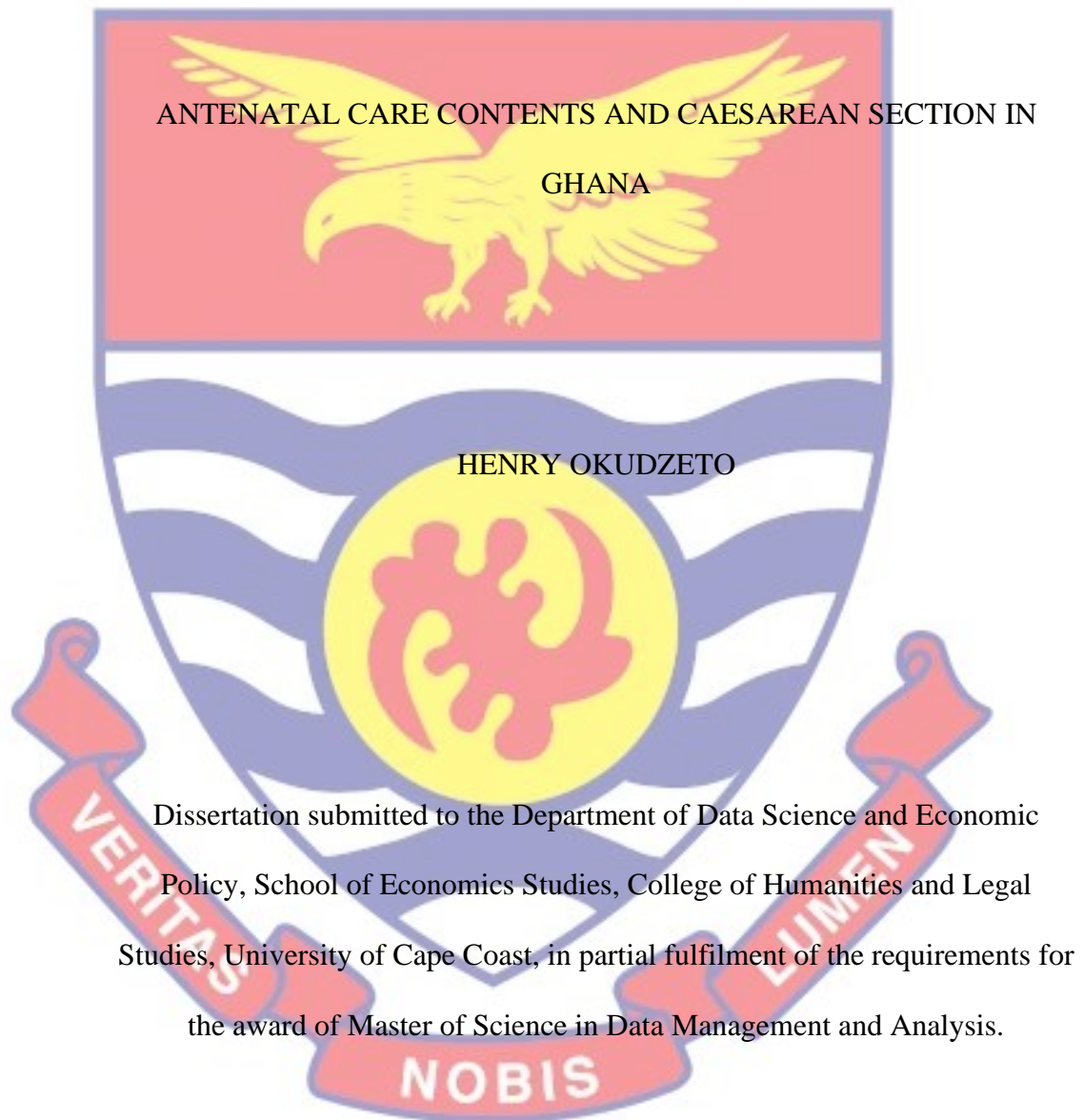


UNIVERSITY OF CAPE COAST



NOVEMBER 2022

DECLARATION

Candidate's Declaration

I hereby declare that this dissertation is the result of my original work and that no part of it has been presented for another degree in this university or elsewhere.

Signature:.....

21st November, 2022

Candidate: Henry Okudzeto

Date

Supervisor's Declaration

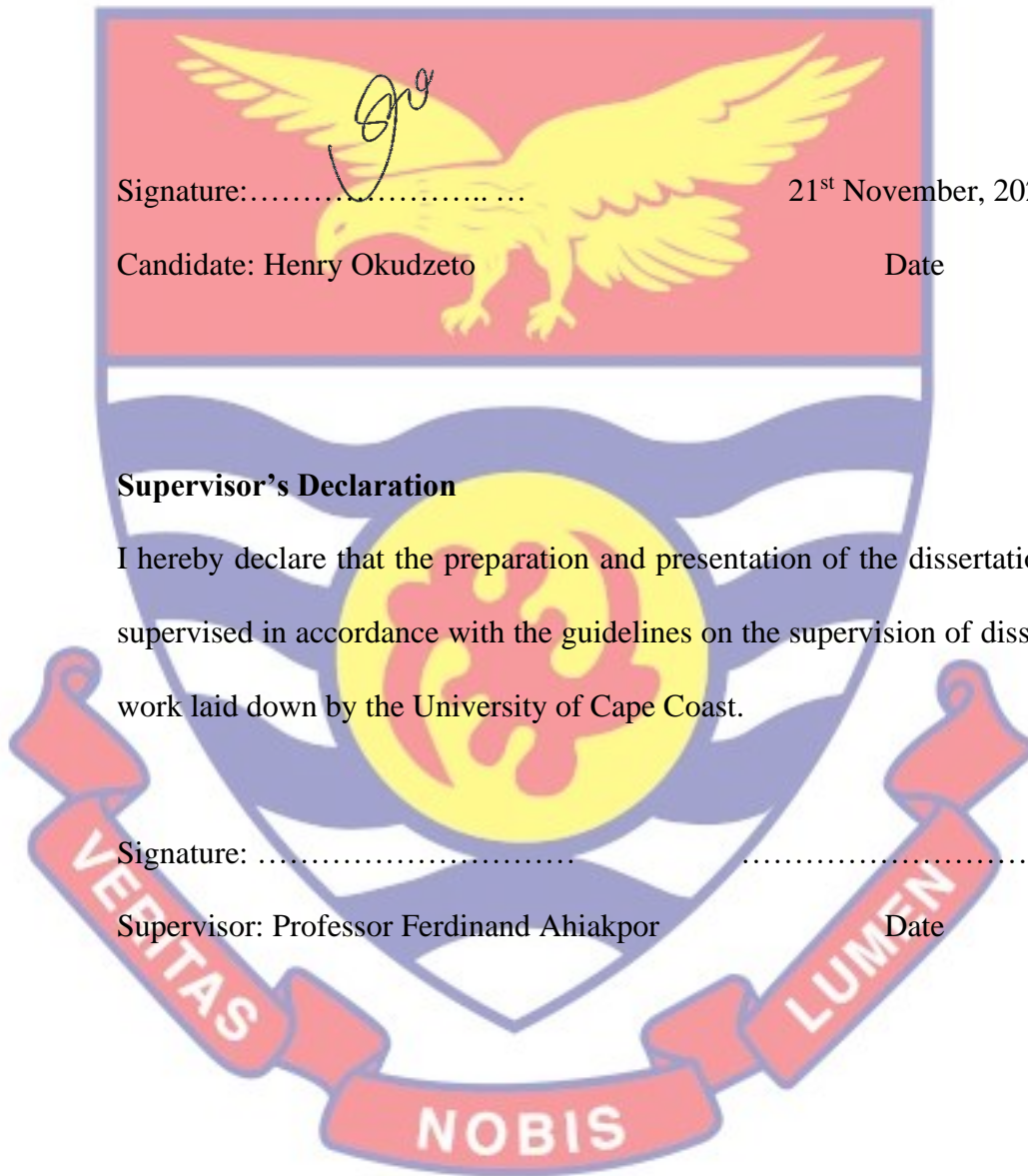
I hereby declare that the preparation and presentation of the dissertation were supervised in accordance with the guidelines on the supervision of dissertation work laid down by the University of Cape Coast.

Signature:

.....

Supervisor: Professor Ferdinand Ahiakpor

Date



ABSTRACT

Antenatal care (ANC) is very necessary for mothers and their unborn children. The need to start on time helps to avoid certain dangers during pregnancy. The rate of caesarean deliveries is significantly increasing in many countries, and Ghana is no exception. This study will assess the effect of the timing of the first antenatal care initiation and the contents of care on caesarean delivery. The study used secondary data that was extracted from the maternal health survey. The study population was 25,062 women who are between the ages of 15 and 49, as defined in the Ghana Maternal Health Survey 2017. The study included only 9237 mothers who have delivered before and also utilized antenatal care during pregnancy. Data were analysed in Stata, where frequencies and percentages with figures were used as illustrations. The rate of caesarean sections is low among mothers who start their antenatal clinic in the first trimester. There is a higher rate of caesarean sections in urban residences as compared to those in rural residences. This was evidenced by the major cities in Ghana. This could be a result of the availability of well-resourced health facilities within these areas. Antenatal care is improving because most women began with it as a preventive measure. This number is comparable to the 69% who stated that they started their antenatal care in the first trimester. Yet antenatal care needs to be encouraged to be started within 16 weeks of pregnancy. This will have a positive impact on caesarean deliveries.

KEYWORDS

Caesarean section

Delivery

Antenatal care



DEDICATION

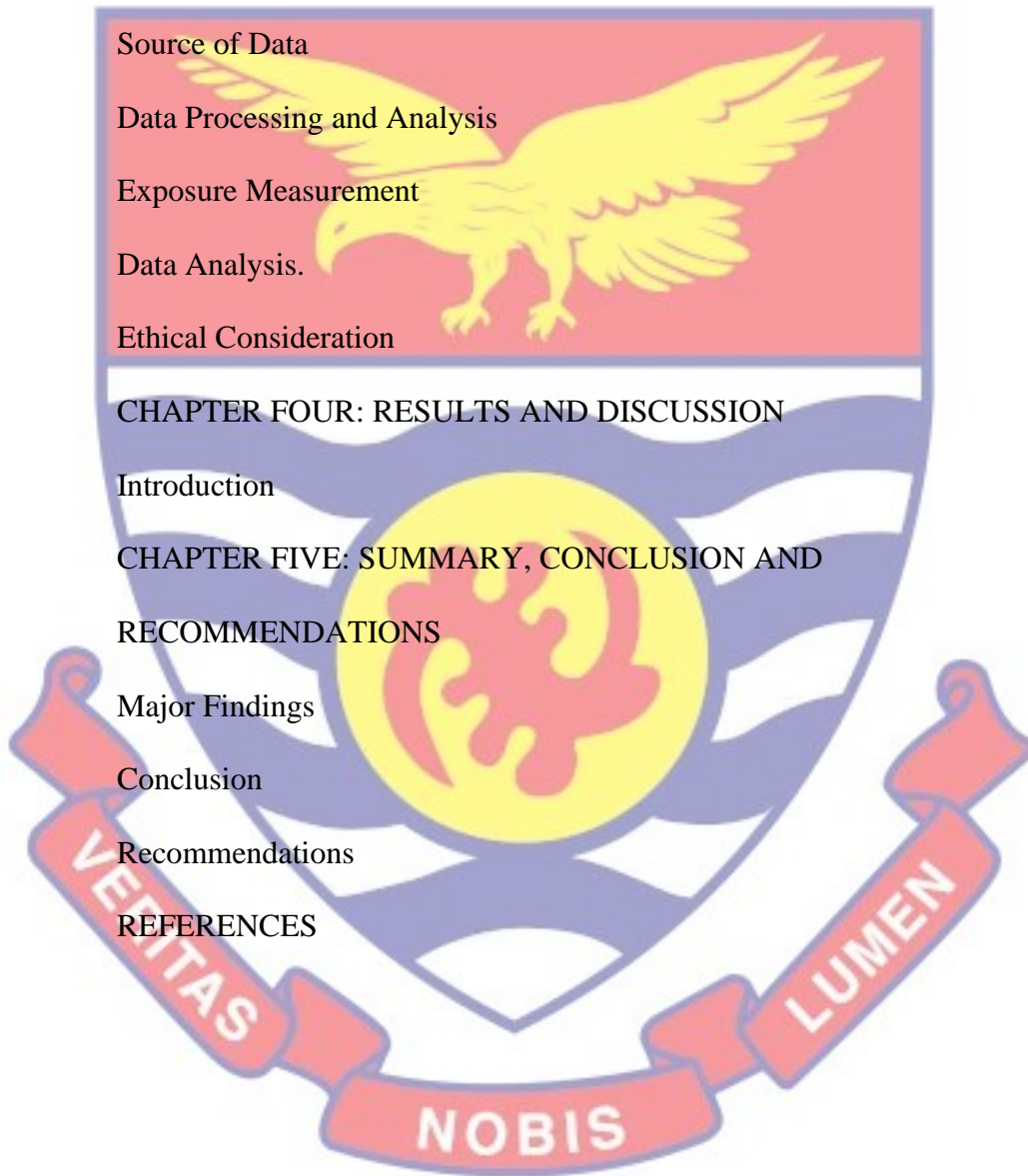
This work is dedicated to the Late Emmanuel Fiifi Mensah Arthur.



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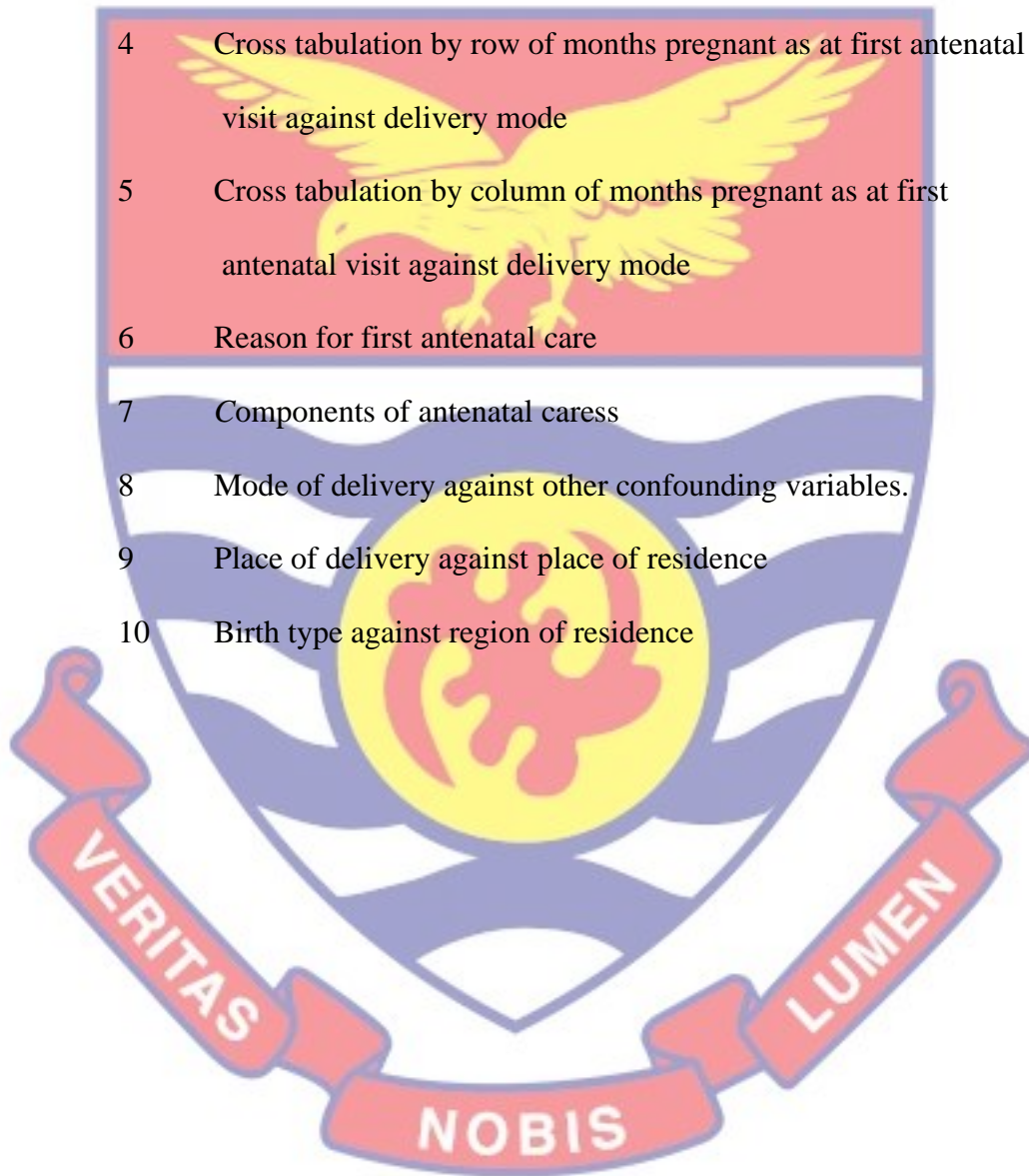
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CHAPTER ONE

INTRODUCTION

Background to the Study

The major cause of death among women of reproductive age is maternal mortality, that is women between the 15 to 49 years (Darteh, 2020). In 2017, 810 women died as a result of preventable causes that relate to pregnancy and childbirth every day (Fuglenes et al., 2011) mater. This means that in a year, about 29500 mothers die as a result of these (Manyeh et al., 2019). Maternal mortality is mostly caused by problems during delivery and delays in receiving emergency obstetric treatment. (Darteh, 2020). Mortality was reduced by 38% between the years 2000 and 2017 (Mgaya et al., 2013; M. A. Nuamah et al., 2017). Young adolescents between the ages of 10 to 14 have a higher risk of complications and death. Mothers or expectant mothers may die of the following complications: severe bleeding after birth, infections, high blood pressure, complications from delivery and unsafe abortion. The Sub-Saharan Africa and Southern Asia record 86% of the total deaths, which is about 254,000 (Nwagbara et al., 2022).

In the Ghana Maternal Health Survey, maternal health is specifically referred to as health care surrounding childbirth; these are, antenatal care, delivery assistance, and postnatal care which include immunizations (Nuamah et al., 2019). The Demographic Health Survey (DHS) maternal health indicators compare maternal health care to national criteria, such as the recommended total number of antenatal care visits and the timing of postnatal care (The DHS Program, 2016). Additionally, the parameters of maternal health care are compared to the status of women (The DHS Program, 2016).

The WHO has recommended that when mothers are pregnant, they need to go for antenatal care (Manyeh et al., 2018). This will help the mother and the unborn baby as a whole during and after the pregnancy stage which will reduce pregnancy complications and stillbirths. It is therefore stated the mother must have at least eight contacts with a health worker either at a health facility or community outreach services. At an antenatal care appointment, there are several checks, scans, tests, and several discussions. Discussions such as when the baby is due, the stage of pregnancy, finding out about the medical history, issues relating to medications and ensuring that the mother is booked for cervical screening. Organising blood tests, checking blood pressure, weight and height of the mother. There is also measuring and listening to the baby's heartbeat. They are also being asked about family violence.

According to the World Health Organisation (WHO) report on postnatal care (PNC), out of the 2.9 million births worldwide, close to half of them die within the first 24 hours after delivery (Laksono et al., 2020). These deaths are as a result of babies born very early or small in size. Other factors like babies with infections can also lead to such death. These deaths can be prevented if the antenatal care of these women were considered as very important. Primary care for newborn includes promoting the need for exclusive breastfeeding. Mothers who deliver in the hospital or a health facility are to schedule postnatal visits with their midwife. Others who deliver at home also need to go to the health facility immediately after delivery. For places where mothers are not able to access the health facility with ease, it is expected that health workers initiate home visits to check on them the first is supposed to be within the first 24 hours,

and the next should be on the third day. A third visit can be made at the end of the first week.

Pregnancy and childbirth remain uniquely complicated and a most important life experience for women, their families and society at large and various interventions have been adopted by the WHO and other bodies to achieve an optimum pregnancy outcome (Id et al., 2020; Tayie, 2008). At the point of delivery, pregnant women can either deliver through the vaginal or caesarean section depending on the conditions surrounding the pregnancy (Prah et al., 2017a). In an attempt to reduce maternal mortality and improve childbirth outcomes, the WHO has developed and adopted a concept of emergency obstetric care services (EmOC) and comprehensive EmOC to be provided for pregnant women at various levels of health facilities (WHO, 2009). Comprehensive care, also known as comprehensive EmOC, requires the ability of a health service organization to perform important signal functions including caesarean section (CS) to improve maternal and perinatal outcomes. (WHO, 2009).

Caesarean section (CS) is one of the oldest surgical procedures in Obstetrics, in which the foetus is delivered via abdominal and uterine incisions (Maroufizadeh et al., 2018). The term "caesarean section" (CS) refers to the delivery of a baby through incisions in the abdominal wall and uterus of the mother. Certain medical indications, such as placenta Previa or transverse lying, necessitate its performance (The DHS Program, 2016). The caesarean section can save the lives of both the mother and the unborn child. Elective caesarean section is when a caesarean section is performed as a result of extensive planning, typically more than 24 hours before delivery. In contrast, an

emergency caesarean section is any caesarean operation that is unplanned or unscheduled. In this situation, the choice is made within twenty-four hours of delivery due to deteriorating mother or fetal health.

The World Health Organization (WHO) promotes Antenatal Care (ANC) and recommends a minimum of eight ANC appointments, with the first visit occurring during the first trimester of pregnancy (Teh et al., 2018). Appropriate ANC introduces pregnant women to the health system, allowing them to give birth at a health centre with trained and qualified personnel. This study is to access the timing and the content of antenatal care for mothers that deliver through Caesarean section using the Ghana Maternal Health Survey 2017.

Statement of the Problem

Childbirth is either done through natural means or through artificial means which is referred to as caesarean section (CS). One's ability to attend the required antenatal care will help her to be able to decide with the help of doctors which form of delivery will be required of a mother. Antenatal care is required to teach the mother about the basic danger signs of pregnancy.

As a matter of fact, for the baby and the mother to be well, they are both expected to attend postnatal care after delivery for them to be assessed to make sure that they are free of any after birth problems. Some mothers do not go for the required number of visits before, during and after their delivery (Duodu et al., 2022).

Therefore, the purpose of this study was to assess the impact of antenatal care visit scheduling (started antenatal care in the first trimester) and antenatal care service components on caesarean section delivery.

The first two days following childbirth are extremely dangerous for moms, and both mother and infant may perish during this period. Providing postnatal care within the first two days after childbirth can help prevent maternal and newborn mortality because it enables the early discovery of abnormalities that could lead to negative maternal and neonatal health outcomes, such as death. In Ghana, understanding of early postnatal care utilization, which is essential for informing policy targeted at lowering maternal mortality, remains limited.

Mothers as well do not take their antenatal care visits seriously as they are supposed to by the standard guidelines. The mortality rate may be on the rise while these services are not well taken seriously which will not achieve the aim of sustainable development goal 3 and its indicators. The goal of this study is to examine the variables of early antenatal care attendance among Ghanaian women who deliver by caesarean section. What is the impact of early antenatal care on delivery by CS?

Purpose of the Study

The main goal of the study was to examine antenatal care contents and caesarean section in Ghana. Specifically, it meant to:

1. determine the first timing of antenatal care visits.
2. examine the contents of antenatal care that mothers received.
3. analyse the effect of timing of first antenatal care initiation and the contents of care on caesarean delivery.

Research Questions

1. When do mothers start their antenatal care?
2. What are the contents of antenatal care that mothers received?

3. What is the relationship between the timing of antenatal care and its contents and caesarean delivery?

Significance of the Study

This study will assess the timing of antenatal care of mothers and the various contents of care and its relationship with caesarean section. The outcome of this study will inform policymakers about the effect of the timing of antenatal care and caesarean section.

Delimitation

The study considered antenatal care contents and caesarean section in Ghana. However, only 9237 mothers who have delivered before and also utilized antenatal care during pregnancy were included. A quantitative approach was adopted which was limited in giving details about the reasons for the relationship between the variables.

Organisation of the Study

The study is structured into five chapters. Chapter one reviews the background of the study, problem statement, study objectives, research questions, significance and justification of the study as well as the organization of the study. Chapter two reviews the existing literature on the subject matter. This is made up of empirical and theoretical underpinnings to the study. Chapter three is basically about the research methodology used in conducting the study. It describes the design and procedures used in obtaining data for the study. The fourth chapter will deal with the data analysis and the major findings of the study. Chapter five examines the summary, recommendations, and conclusions of the study.

CHAPTER TWO

LITERATURE REVIEW

Introduction

This chapter looks into literature about maternal health mainly antenatal care, postnatal care and caesarean section. This chapter is organised thematically under antenatal care, the importance of antenatal care, postnatal care, the importance of postnatal care, caesarean section, medical reasons for caesarean section and its importance.

Antenatal Care

Antenatal care (ANC) can be defined as the care given to pregnant women by trained health professionals to guarantee the optimal health of both mother and child before and during birth (Tekelab et al., 2019). The technique for minimizing maternal morbidity and death is prenatal care. Consequently, it seeks to monitor and preserve the health and safety of the mother and foetus. It also helps to identify pregnancy-related complications and takes the important actions, prepare for birth and as well promote the healthy life of the mother and the unborn child (Dwi et al., 2020; Hijazi et al., 2018). Antenatal care increases the rate of using a skilled birth attendant (Tekelab et al., 2019) and hence will reduce the maternal and neonatal mortality rate.

In a report published in 2019, it stated that in Africa, antenatal care is a success story, since 69% of women have at least one antenatal care visit (Poote & McKenzie-McHarg, 2019). In contrast, less than 80 percent of mothers in Sub-Saharan Africa receive antenatal care in 2018 (Tekelab et al., 2019).

The WHO recommends that every mother or expectant mother is to have four antenatal care visits with the first one starting in the first trimester. In contrast, low turnout throughout the prenatal period breaks the critical link in the continuum of care and contributes to poor birth outcomes (Poote & McKenzie-McHarg, 2019; Tekelab et al., 2019). This turns out to affect the

mother and the fetus which also affects the mode of delivery. Mothers who have no antenatal or low antenatal visits are more likely to deliver at home or with unprofessional birth attendants. Some may miss their due dates. Identification and management of obstetric complications such as preeclampsia, tetanus toxoid immunization, intermittent preventive treatment for malaria during pregnancy (IPTp), and identification and management of infections such as HIV, syphilis, and other sexually transmitted infections (STIs) are essential interventions in ANC (Poote & McKenzie-McHarg, 2019)

During ANC, healthy behaviour such as breastfeeding, the need to start postnatal care, and planning for childbirth are also acquired. ANC attendance is influenced by geographical, socioeconomic, religious, cultural, and demographic factors (Sakeah et al., 2017). In Ghana, the maternal mortality ratio is 310 per 100,000 live births. Neonatal and infant mortality is 25 out of 1000 and 37 out of 1000 respectively meanwhile ANC coverage was estimated to be 97.3% (P. K. Appiah et al., 2020).

Goal of Antenatal Care

The first visit is between 8 to 12 weeks. At this stage, pregnancy will be confirmed. The women will be screened, treated and given preventive measures. There is a development of a birth and emergency plan. The second visit starts between 24 weeks and 24 weeks. At this stage, the health care provider will

assess maternal and fetal wellbeing. Review and modification of birth and emergency plan. There is also advice and counsel. The third visit is when the pregnancy is 32 weeks. At this time maternal and fetal well-being are also assessed.

In a study conducted using the three health and demographics surveillance sites, it was found that women with low socioeconomic status were likely to report at least four antenatal care visits. Moreover, women who did not have national health insurance are also less likely to have four antenatal care visits (Sakeah et al., 2017).

Content of Care

In a 2016 study conducted by Helga et al in Iceland, using a longitudinal cross-sectional cohort study design (Gottfredsdottir et al., 2016). Approximately 66% of all the participants had formal education and were more likely to have attended structured birth classes. As compared to multiparous women, more primiparous women 46% perceived that little time was spent on information regarding birth preparedness and complication readiness and as a result, they were not adequately prepared for birth. In addition, women who had planned CS were satisfied with the information provided in antenatal care regarding the approaching birth. However, women who had vacuum extraction or emergency CS were more likely to report inadequate time spent on birth information (Prah et al., 2017b). And evidently, women who reported having few antenatal visits believed that too little time was spent on antenatal care information, which likely contributed to their birth difficulties. Overall, Icelandic women have high expectations of the content of care which they

defined to be the number of antenatal visits and information given during every antenatal care class (Padmadas et al., 2000).

Obstetrics, Fertility, and Reproductive Health Related Characteristics

Two decades ago, a retrospective study was conducted in Kerala (India) using the National Family Health Survey database to assess the demographic, antenatal care, spatial and socioeconomic variables associated with CS deliveries. The study results present significant differences in the mothers' age at birth and CS deliveries. For instance, mothers aged 30 years and above are at higher risk as compared to mothers under 20 years. Also, CS deliveries are influenced by first-time deliveries compared to subsequent deliveries. The tendency to undergo CS was further influenced by the number of antenatal care visits, however, there was an expected result which showed that the proportion of CS is almost double for mothers who had over 5 times the antenatal care visits compared to those with fewer visits. This is in complete contrast to several studies that explain that CS deliveries should be low with a higher number of antenatal care visits since there could be early identification of obstetric complications (Padmadas et al., 2000; Villar & Bergsjö, 1997).

Post-natal Care

In sub-Saharan Africa, 48 percent of women give delivery with trained assistance. Additionally, 13 percent of women who gave birth at home received postnatal care within 2 days (Beraki et al., 2020) where the baby is generally assessed and birth weight and other vitals are been recorded in the maternal book of the mother. At least 125,000 women and 870,000 newborns died in the first week after birth in Africa in 2015, according to the World Health Organization (Mahmood et al., 2010). The postpartum period accounts for 61%

of all maternal deaths each year. On the first day of life, more than half of these deaths occur (F. Appiah et al., 2021). According to Okawa et al, factors contributing to maternal and new-born mortality include young maternal age, primiparity or grand-multiparity, short intervals between births, maternal health issues, and not breastfeeding (Okawa et al., 2015; Sakeah et al., 2017). Appiah et al stated that in 2017, Sub-Saharan Africa accounted for 66% of the global death. Generally, postnatal care is highly utilized in urban areas than the rural areas due to the lack of facilities and proximity to the health facility (Probandari et al., 2017).

A standard postnatal care involves physical examinations, education on exclusive breastfeeding and family planning. Postnatal care programmes are among the weakest of all reproductive and child health programmes in Africa. In a study that was conducted in Greater Accra, where mothers were taken from the Regional Hospital through to the district level, it was found that mothers who deliver in the regional hospitals have prior instructions concerning their postnatal care visits while those in the districts and the sub-districts have fewer information about their visits despite the gap in education on recognizing problems and how to prevent them serious complications after birth (Owen et al., 2020)

Key indicators for postnatal care include the mother and infant receiving care within three days after birth and subsequent visits. The care is supposed to be provided at the health facility where a healthcare provider will assess the mother and baby. There is also a timely initiation of breastfeeding within the first hour after birth. Newborns who are sick are taken for treatment immediately.

Caesarean Section

Caesarean section (CS) is a life-saving (Dankwah et al., 2019) surgical intervention performed when complications occur during pregnancy and/or labour. CS is the most common major operation worldwide for the mother and the baby. Research by Id et al. (2020) indicated that when the mother or the baby's life is in danger, a caesarean section is frequently performed. Psychosocial factors such as anxiety about vaginal delivery and even the mother's wish to have a caesarean section for no obstetric indication influenced the decision to undergo a caesarean section (Prah et al., 2017c).

Nearly 18 million caesarean births are conducted each year around the world, according to the World Health Organization (WHO) (Lyell et al., 2016). 24.5 percent of women in Western Europe, 32 percent of women in North America, and 41 percent of women in South America had caesarean sections in 2016. (Keag et al., 2018). Although caesarean sections have had a significant impact on maternal and fetal outcomes over the past decade, there is still a long way to go. Short- and long-term maternal and newborn problems have been linked to caesarean sections. It is not clear whether caesarean sections are related to better results for mothers and newborns, even though the procedure's use has increased dramatically in recent years (Gedefaw et al., 2021; Hyde et al., 2012).

Medical conditions such as macrosomia, pregnancy-induced hypertension, maternal weight, among others are the causes of CS (Dankwah et al., 2019). This is to help ease delivery for both the mother and the baby.

The WHO recommends eight (8) antenatal visits before delivery for early diagnosis of complications to enhance positive birth outcomes (World Health Organization, 2016). For early detection of difficulties leading to a CS, prenatal care must begin in the first trimester and be maintained until delivery (Okumus & Sohbet, 2013a). It was projected that less than half of Turkish women who underwent a caesarean section (CS) received antenatal care in all three trimesters and that 67.8% of the women who went to the antenatal clinic did so at the offices of obstetricians (Okumus & Sohbet, 2013a).

Women who did not think they needed it did not get the service. An educational campaign could help dispel the misconception that antenatal treatment is only for women who are at risk of difficulties during childbirth. Obstetricians are more likely to perform CS on pregnant women who receive prenatal care from them, so better coordination between them and midwives is needed in the future to promote normal births (Okumus & Sohbet, 2013a). This could be that people who think they may have issues with delivery are those that visit the antenatal clinics which should not be the case. Adding to that, insufficient antenatal care is also seen as a key factor in the rise of utilizing antenatal clinics. A study in Tanzanian showed that the fear of caesarean section makes it difficult for women to seek intrapartum care from health facilities (Mrisho et al., 2009). A current manuscript showed that caesarean section is likely to be performed three times more in private facilities than in public facilities (Singh et al., 2018).

In a descriptive exploratory qualitative research carried out in the western region of Ghana to explore the care given to mothers before and after caesarean section, most mothers were not satisfied with the level of privacy,

information and physical support provided for them by their midwives before surgery (Afaya et al., 2020). This makes them shy away from using the facility. Some of the positive experiences by the mothers were related to the psychological support and pain management offered to them before and after CS (Afaya et al., 2020).

The prevalence of elective CS rate was estimated to be around 35.3% of all births (Konlan et al., 2019). An appreciable number of mothers opted for CS without any medical or surgical indications (Ahmed & Mohammad, 2019). Reasons for choice included pain-free birth, advice from family and friends, religious advice, prestige, financial capability, maternal age, the desire to also give birth on a special date and late child delivery (Ahmed & Mohammad, 2019; Darteh, 2020; Konlan et al., 2019; Richard Adongo Afaya et al., 2018).

Complications may follow after a caesarean section just like any other major surgery, a study found that over a third of women who had caesarean section (38%) had adhesions, and this occurred more often if they had had a previous caesarean section or abdominal surgery (M. A. Nuamah et al., 2017).

This increasing desire for caesarean section can only be reduced when women are given adequate education on the importance of normal birth during antenatal care (Okumus & Sohbet, 2013b). A study recommended that Nurses and midwives during the antenatal period should educate their clients carefully about caesarean section, especially those who may opt for it without any medical or surgical indication (Harrison & Goldenberg, 2016; Konlan et al., 2019). Expectant mothers should be made aware of the many complications such as adhesions that accompanies caesarean section (M. A. Nuamah et al., 2017; Richard Adongo Afaya et al., 2018)

Some studies have attributed the increase in caesarean section to multiple factors. These are health facility type(Huang et al., 2013), and socioeconomic characteristics of expectant mothers (Manyeh et al., 2018; Parrish et al., 1994). Manyeh et al also stated that the age of the mother(Ecker et al., 2001; Parrish et al., 1994), birth order and weight(Parrish et al., 1994),

place of residence, level of education, history of caesarean section, maternal request, and level of income are some factors.

The importance of caesarean section is the lower risk of sexual dysfunction, lower risk of a baby being deprived of oxygen, and lower risk of a baby experiencing trauma while passing through the birth canal. A mother may also experience some disadvantages such as the likelihood to repeat caesarean section in future deliveries, there could be a higher risk. Mothers will need to stay in the for longer recovery periods like up to five days after delivery. Even though these are the importance and disadvantages, it is sometimes the best option. A doctor may schedule an advance due date or it may become the only way forward during labour because of an emergency.

Medical Reasons for Caesarean Section

Prolonged Labour

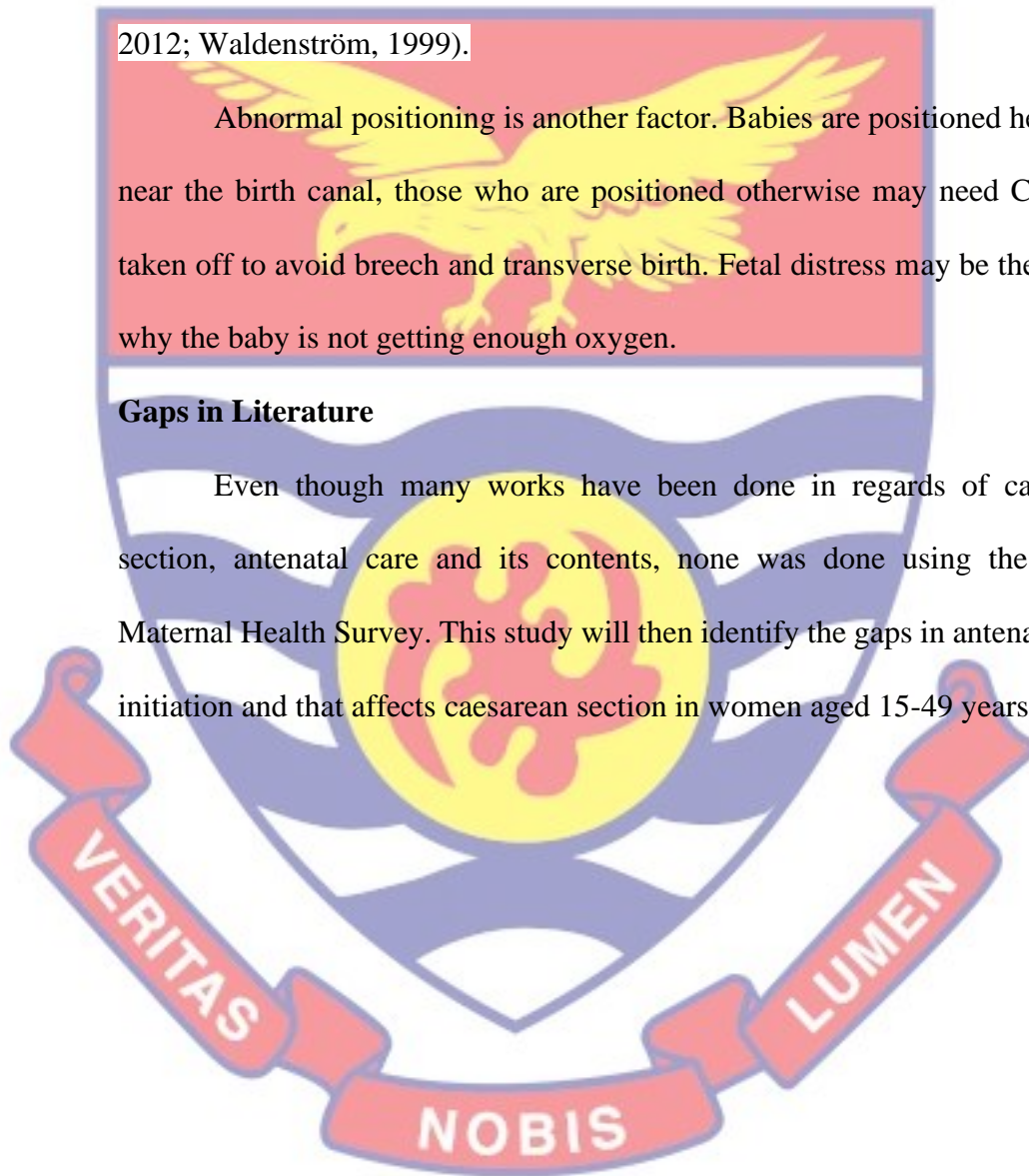
The WHO defines prolonged labour as active labour that lasts for more than 12 hours(WHO, 2008). Prolonged labour is the failure of progress or stalled labour. This is when a mother is in labour for 20 hours or more for first time mothers and 14 hours and more for mothers who have given birth before. Babies that are too large to pass through the birth canal tend to slow cervical thinning. A mother carrying multiple babies could also be a factor. Prolonged labour is related to an increased risk of complicated deliveries and interventions, such as

operative delivery (Cheng et al., 2010; Gaudernack et al., 2020; Lowe, 2007). The major cause of prolonged labour is Obstructed labour (Opoku & Nguah, 2015). . Women with prolonged labour had an increased risk of a negative birth experience (Soriano-Vidal et al., 2016; Walker et al., 2015). Some studies have also not found any negative experience of prolonged labour (Bergqvist et al., 2012; Waldenström, 1999).

Abnormal positioning is another factor. Babies are positioned head first near the birth canal, those who are positioned otherwise may need CS to be taken off to avoid breech and transverse birth. Fetal distress may be the reason why the baby is not getting enough oxygen.

Gaps in Literature

Even though many works have been done in regards of caesarean section, antenatal care and its contents, none was done using the Ghana Maternal Health Survey. This study will then identify the gaps in antenatal care initiation and that affects caesarean section in women aged 15-49 years.



CHAPTER THREE

METHODOLOGY

Introduction

This chapter is vital for the conduct of this research which involves all necessary activities for the study. The methodology is the science behind the systematic way of applying appropriate methods for undertaking a research activity. The methodology is a blueprint for conducting a study (Colling, 2003). This chapter includes research design,

Research Design

As the blueprint for data collection, measurement, and analysis, research design refers to the overall plan you pick to combine study components in an orderly and logical manner. This ensures that your research topic was effectively addressed. The study is a quantitative one that relies on data from secondary sources. This will help identify knowledge gaps which can serve as the foundation of further systematic investigation. Designing a study to incorporate quantitative research methods is known as quantitative research design

Source of Data

The study uses secondary quantitative data from the Ghana Maternal Health Survey (The DHS Programme, 2017) conducted in 2017. The data was taken after permission was granted from the Demographic and Health Survey (DHS) website.

Table 1: Regions and the number of people sampled

Region	Freq.	Percent
Western	2334	9.31
Central	1603	6.40
Greater Accra	2535	10.11
Volta	1466	5.85
Eastern	2172	8.67
Ashanti	3136	12.51
Brong Ahafo	2302	9.19
Northern	4202	16.77
Upper East	2709	10.81
Upper West	2603	10.39
Total	25062	100.00

Source: Field Survey (2022)

Table 1 shows the number of women sampled from each region. This is based on the ten administrative regions. The regions with the highest number of women are Northern, Ashanti, Upper East, Upper West and Greater Accra while Volta Region have the least number of participants.

Data Processing and Analysis

Data cleaning

The data was cleaned by taking off variables that would not be used for the analysis. The data was made from 25,062 mothers who are fifteen to forty-nine years. Mothers who have not given birth before were not included. That's mothers with zero birth were dropped. 17,142 mothers gave birth before the survey and 7,920 mothers were dropped because they have not given birth

before the survey. All missing variables for the mode of delivery were also dropped and the sample size is now 9,237 mothers.

Independent variables

The independent variable is caesarean section. This is to verify whether a mother's delivery was caesarean delivery or not. This variable was coded as yes for caesarean delivery "1" and no for caesarean delivery "0." All missing values were dropped.

Exposure Measurement

Covariates included aspects of sociodemographic antenatal care service use, fertility, and reproductive health. The mother's age, education level, religion, marital status, job position, and birth order of the most recent kid are all sociodemographic variables. The time of the first prenatal care appointment, the number of antenatal care visits and the substance of antenatal care are other exposure variables that were considered.

Data Analysis.

The data was obtained in Stata format and was analysed using STATA version 17 statistical software. Analytical, as well as descriptive statistics, were calculated. Using the control model, the study examined the relationship between caesarean section and the timing of antenatal care commencement and the content of care by incorporating covariates in the bivariate logistic regression with a p-value less than 0.5.

Ethical Consideration

The DHS website (<https://dhsprogram.com>) was used to access all of the datasets, and no ethical approval was necessary. However, the secondary data was used appropriately and for the purpose of the study only.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

This chapter presents the findings of the study and offers discussion of these findings in comparison to literature. Results were shown using charts, tables and figures. The results will be discussed based on research questions. The analysis was done for 9237 mothers who have delivered before and also utilized antenatal care during pregnancy. All missing observations were dropped.

Table 2: Demographic characteristics of respondents

Variable	Freq.	Percent
Ethnicity		
Akan	3176	34.38
Ga/Dangme	389	4.21
Ewe	809	8.76
Guan	303	3.28
Mole-Dagbani	3121	33.79
Grusi	502	5.43
Gurma	597	6.46
Mande	123	1.33
Other	217	2.35
Region Of Residence		
Western	831	9.00
Central	583	6.31
Greater Accra	852	9.22
Volta	448	4.85
Eastern	760	8.23
Ashanti	1106	11.97
Brong Ahafo	905	9.80
Northern	1459	15.80
Upper East	1247	13.50
Upper West	1046	11.32
Type Of Place of Residence		
Urban	4647	50.31
Rural	4590	49.69
Religion		

Table 2:Cont

Table 2:Cont.		
		13.51
Anglican	54	0.58
Methodist	349	3.78
Presbyterian	401	4.34
Pentecostal/Charismatic	3276	35.47
Other Christian	1085	11.75
Islam	2435	26.36
Traditional/Spiritualist	173	1.87
No Religion	216	2.34
Ever Attended School		
Yes	6657	72.07
No	2580	27.93
Total	9237	100.00

Source: Field Survey (2022)

The survey considers nine thousand two hundred and thirty-seven mothers who have given birth before and had at least attended antenatal care while pregnant. The majority are Akans with a total of 3176 mothers which represents 34.4%, followed by the Mole-Dagbani ethnic group which is 3121 representing 33.8%. The next larger group is the Ewe which represents 8.8% of the total sample.

The survey took place in the 10 regions in Ghana after which there was a division into 16 regions. From Table 2 *Table 2: Demographic characteristics of respondents*, the highest number of respondents came from the Northern Region of Ghana. They are one thousand four hundred and fifty-nine which corresponds to 15.8%. The next highest number of mothers are from the upper east with a frequency of one thousand two hundred and forty-nine which corresponds to 13.5% while the Volta region had the lowest number of mothers. There were 448 mothers that represent 4.9% of the sample. The type of residence that mothers stay is classified into 2, rural and urban. There are 4647 mothers that reside in urban areas while 4590 reside in rural areas. Three thousand two hundred and seventy-six mothers are charismatic or Pentecostals

with a percentage of 35.5%, followed by Islam with a number of 2435 which corresponds to 26.4%. The list is those that are Anglicans with a frequency of 54 which is less than 1% of the sample. Majority of the women have never attended school. More than half, that is 72.1% have ever attended school while 27.9 have never attended school.

Timing of first antenatal care

Table 3: When antenatal care was started

months pregnant at first antenatal care	Freq.	Percent
1 st Trimester	6403	69.32
2 nd Trimester	2707	29.31
3 rd Trimester	127	1.37
Total	9237	100.00

Source: Field Survey (2022)

Table 3 above shows the timing of antenatal care by mothers. The data show that majority of mothers were able to go for their first antenatal care visit during their first trimester. Out of the 9237 mothers, 6403 which corresponds to 69.32% indicated that they have their first antenatal care clinic visit during the first trimester of their pregnancy. Also, 2707 mothers reported that they went to the antenatal clinic during the second trimester. This shows that 29% for the second trimester and 127 which corresponds to 1.4% are those that attend their antenatal care in the third trimester.

Table 4: Cross tabulation by row of months pregnant as at first antenatal visit against delivery mode

delivery by caesarean section	months pregnant at first antenatal care			Total
	1st Trimester	2nd Trimester	3rd Trimester	
yes	74.08	25.36	0.56	100.0
no	68.57	29.92	1.50	100.0
Total	69.32	29.31	1.37	100.0

Source: Field Survey (2022)



Table 4 shows a cross tabulation of delivery by caesarean section against months pregnant when antenatal care was initiated. Mothers who delivered through CS have 74% of them who started their antenatal visit with the first trimester. Also 25% of them started their visit in the second trimester while less than 1% of them started their visit in the third trimester. Majority of those that delivered

through CS have started their antenatal clinic as recommended by the WHO guidelines.

Also, with the mothers who did not deliver through CS have majority (69%) of them starting their antenatal visit in the first trimester. Only 29% of them started their antenatal clinic in the second trimester while less than 2% started their antenatal clinic in the third trimester.

Overall, irrespective of the mode of delivery, majority of the mothers were able to start their antenatal clinic within the first trimester.

Table 5: Cross tabulation by column of months pregnant as at first antenatal visit against delivery mode

delivery by caesarean section	months pregnant at first antenatal care			Total
	1 st Trimester	2 nd Trimester	3 rd Trimester	
Yes	14.46	11.71	5.51	13.53
No	85.54	88.29	94.49	86.47
Total	100.00	100.00	100.00	100.00

Source: Field Survey (2022)

Table 5 shows a cross tabulation by column the delivery mode against months pregnant at first pregnant. For those who started antenatal visit in the

first trimester, only 14% of them gave birth through CS while majority (86%) of them did not deliver through CS. For those who initiated visit in the second trimester, only 12% of them delivered through CS while majority of them (88%) did not deliver through CS. Also, for those that initiated their antenatal visit in the third trimester, only 14% of them delivered through CS while 86% of them do not.

Table 6: Reason for first antenatal care

first antenatal care because of	Freq.	Percent
problems or check-up		
Problem	1231	13.33
Just check-up	8006	86.67
Total	9237	100.00

Source: Field Survey (2022)

Mothers were asked the reason for their first visit. Majority of them went for their first antenatal care just for a check-up. More than half (86.7%) reported that they went for the visit due to a check-up and only 13% said they went to the ANC clinic because of problems. This means it is more likely that mothers who are pregnant will visit the hospital or the ANC clinics for a check-up.

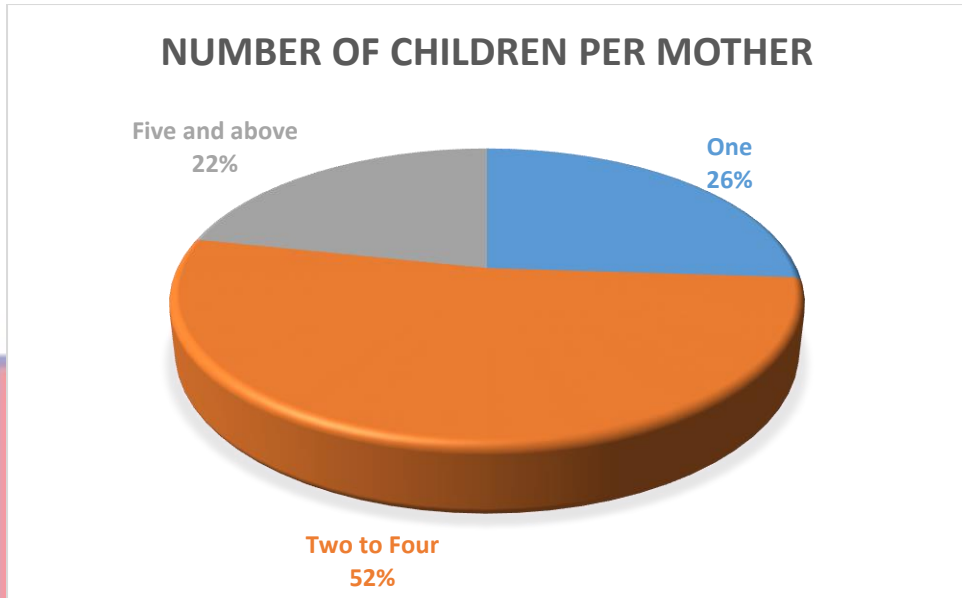
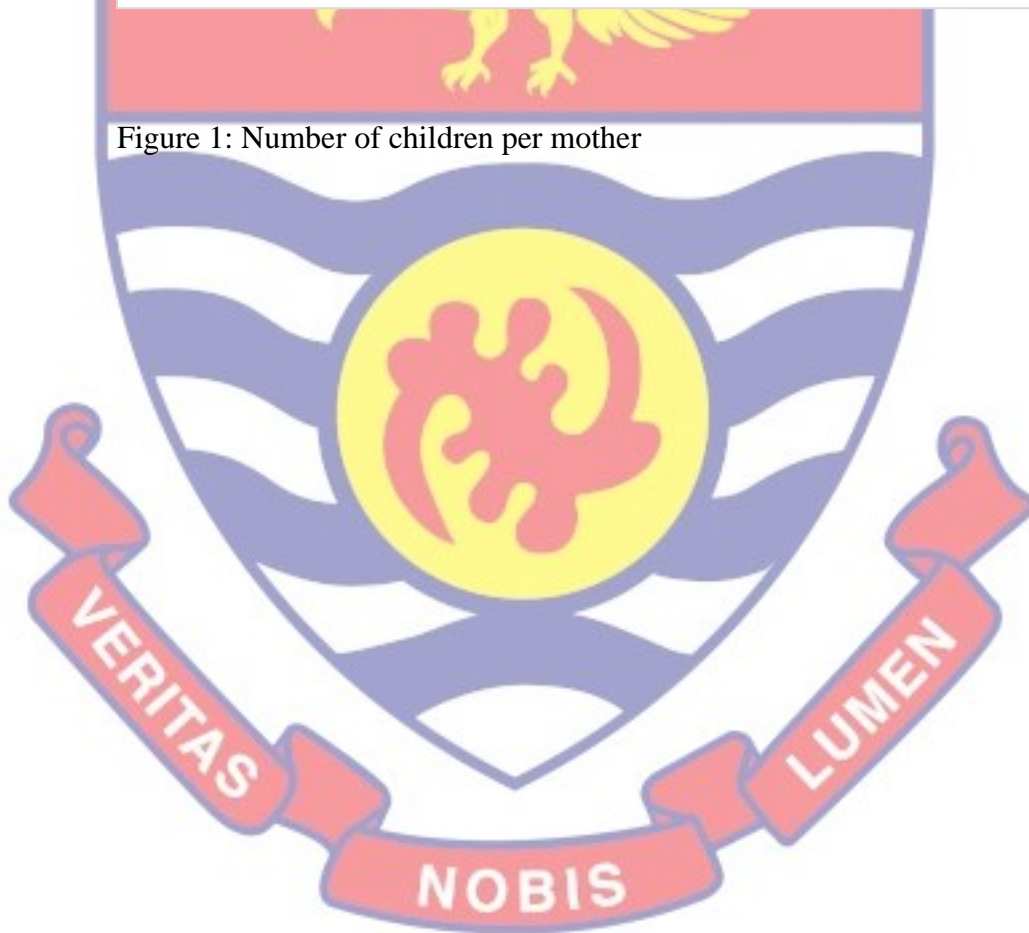


Figure 1: Number of children per mother



The number of births was grouped into three. Those who have only a child before the survey is 2404 which corresponds to 26%, 2-5 children of total birth constitute 52.3% which is the highest and those that had five children and above form the least of the sample. They are 2001 which corresponds to 12.7%.

Content of antenatal care

Table 7: Components of antenatal caress

Components of antenatal care	Freq.	Percent
Blood Pressure		
yes	9201	99.61
no	36	0.39
Blood sample		
yes	9110	98.63
no	127	1.37
Urine sample		
yes	9021	97.66
no	216	2.34
Weight		
yes	9203	99.63
no	34	0.37
iron tablets during pregnancy		
yes	8884	96.18
no	353	3.82
tetanus injection during pregnancy		
yes	8258	89.40
no	979	10.59
told about pregnancy complications		
yes	7942	85.98
no	1295	14.02
told about where to go if had any complications*		
yes	7741	97.47
no	201	2.53
drugs for intestinal parasites		
yes	4043	43.77
no	5194	56.23
Total	9237	100.00

Source: Field Survey (2022)

Table 7 above shows the series of care at the antenatal care. As part of a woman's routine, there are certain procedures to take place at the antenatal clinic. From the table, it is seen that majority (99%) of the mothers had their blood pressure taken. Majority (98.6%) also had their blood samples taken while 99.7% had their urine samples taken. These samples are used to perform various laboratory tests. The results of these tests will also be used to make informed decisions as to what kind of care the mother needs.

The weight of the mother is also measured from time to time as the mother comes for antenatal care. This weight is used to calculate the weight of the unborn baby. Majority (99.6%) of the mothers have their weights taken.

Taking iron tablets during pregnancy help and every pregnant woman should take it. Out of the 9237 mothers, 8884 had taken their iron tablets and 8258 which corresponds to 89.4% have also taken their tetanus injection.

At the clinics, mothers are also thought the various danger signs during pregnancy. They are also thought how to do the fetal count from the number of kicks. Mothers are expected to visit the clinic or the facility immediately if they identify any danger signs. Some danger signs and pregnancy-related disorders are convulsions, headache, swollen legs, breasts becoming hot and feel painful, mood changes, persistent vomiting, severe abdominal pains and excessive bleeding from the birth canal. The survey showed that 86% of the mothers were told about pregnancy complications. Out of the 7942 mothers that were told about danger signs, 7741 which corresponds to 97.5% were told or knew where to go when they have any pregnancy-related complications. Also, more than half of the mothers are not aware of intestinal parasites. There are 5,194 mothers which corresponds to 56% who have no drugs for intestinal parasites while the

rest 4043 correspond to 44% who have taken drugs for intestinal parasites.

Table 8: mode of delivery against other confounding variables.

Variable	delivery by caesarean section		Odd Ratio (95% Confidence Interval)
	No	Yes	
Months pregnant at first antenatal care			
1 st Trimester	5477 (59.3)	926(10.0)	0.81(0.62-1.05)
2 nd Trimester	2390 (25.9)	317 (3.4)	
3 rd Trimester	120 (1.3)	7(0.1)	
Total births			
One child	2054 (22.2)	350 (3.8)	1.08(0.89-1.31)
2-4 children	4179 (45.2)	653 (7.1)	
Five and above	1754 (19.0)	247 (2.7)	
Antenatal care: blood pressure			
yes	7957 (86.1)	1244 (13.5)	2.44(0.32-18.62)
no	30(0.003)	6 (0.0006)	
antenatal care: blood sample			
yes	7870	1240	0.98(0.25-3.83)
no	117	10	
antenatal care: urine sample			
yes	7785 (84.3)	1236 (13.4)	0.39(0.09-1.69)
no	202 (2.2)	14 (0.2)	
during any antenatal care talked about pregnancy complications			
yes	6851 (74.2)	1091 (11.8)	0.88(0.74-1.05)
no	1136 (12.3)	159 (1.7)	
told about where to go if had any complication			
yes	6672 (84.0)	1069 (13.5)	0.98(0.41-2.30)
no	179 (2.3)	22 (0.3)	
iron tablets during pregnancy			
yes	7682 (83.2)	1202 (13.0)	0.79(0.51-1.23)
no	292 (3.2)	48 (0.5)	

Table 8: Cont.

don't know	13(0.1)	0	
tetanus injection during pregnancy			
yes	7118 (77.1)	1140 (12.3)	0.77(0.618-0.95)
no	830 (9.0)	108 (1.2)	
don't know	39 (0.4)	2 (0.0)	
tetanus injections before pregnancy*			
yes	1683 (44.1)	265 (6.9)	0.95(0.83-1.09)
no	1550 (40.6)	190 (5.0)	
don't know	110 (2.9)	16 (0.4)	
drugs for intestinal parasites			
yes	3499 (37.9)	544 (5.9)	0.98(0.87-1.11)
no	4271 (46.2)	679 (7.4)	
don't know	217 (2.4)	27(0.3)	
first antenatal care because of problems or check-up problem	1037 (11.2)	194 (2.1)	0.80(0.57-1.13)
just check-up	6950 (75.2)	1056 (11.4)	
antenatal care: weight			
yes	7960 (86.2)	1243 (13.5)	1.92(0.22-17.17)
no	27 (0.3)	7 (0.1)	

Source: Field Survey (2022)

A bivariate logistic regression was done to access the content of antenatal care and the mode of delivery. Women who go for antenatal care during their first semesters are likely to deliver through caesarean section. For the first trimester, 926 (10%) had caesarean section while in the second trimester, 317 (3.4) had caesarean section and out of the 127 that started their antenatal care in the third trimester, only 7 (0.1%) deliver through caesarean section. The odds of a delivering through caesarean section considering the start of antenatal care is 0.81(CI 0.62-1.05). Mothers who have a total of 2 to 4

children are likely to have CS with a percentage of 7.1%. Mothers who have five children and above are less likely to deliver through CS. 2.7% of mothers who had five children and above deliver through CS. The odds of delivering through CS is 1.08 (0.89-1.31).

Also, during an antenatal clinic, mothers go through many procedures.

This includes blood pressure checks, and sample taking for laboratory tests. Mothers who deliver through CS have their blood pressure checked during the antenatal visit. Only 6 mothers said that they have never checked their blood pressure. Overall, only 36 mothers said that their blood pressure have not been checked. This can be attributed to them not knowing the name of the process or have forgotten since this is one of the vitals that is been taken at the health facilities. This may also be attributed to the facilities that do not have the equipment. The odds ratio is 2.44 (0.32-18.62). Mothers go through many laboratory procedures during the antenatal clinic. Out of 1250 that delivers through CS, only 10 of them had no blood sample taken. These samples are used for further investigations to access the blood types and also to know if the mother has any infection like HIV. This will help the nurses or health staff to put the mother on the necessary medications to save the child in case there is any mother-to-child intervention.

Concerning urine samples, of those who did not have CS only 2.2% of them that their urine sample was not taken. Also, those that have CS have only 14 (0.2%) of them that have no urine sample taken. The odd ratio is 0.39 (0.09-1.69). Mothers were also assessed about danger signs and pregnancy complications. Those that have not given birth through CS had 6851 (74.2%) who were informed about pregnancy complications and 1136 (12.3%) who were

not. Also, of those that had CS, 1091 (11.8%) were told about pregnancy complications at the antenatal clinic while only 159(1.7%) were not told about pregnancy complications. Overall, mothers were duly informed about pregnancy complications. Mothers who responded that they were told about pregnancy complications were also assessed about where to go when they have

complications. The majority said they were told where to go. Those that did not deliver through CS have 6672 (84.0%) saying they know where to go when they have complications and 179(2.3%) said they don't know where to go. Also, those that had CS have 1069(13.5%) of them knowing where to go when there is a complication and only 22(0.3%) don't know where to go with complications. Overall, mothers have an idea about complications during pregnancy and where to go except a few.

Mothers are expected to take iron tablets during pregnancy as a supplement to help boost the haemoglobin. It helps to increase the blood level in the woman and the unborn baby. Majority of mothers had iron supplements but only a few 48 (0.5%) delivered through CS had not taken any iron supplement.

The mother takes tetanus injections as part of their routine antenatal clinic care to prevent the woman and the unborn baby from tetanus infection. From the survey, majority of the women had their tetanus injection, that's mothers who delivered through CS are 1202 (13.0) and those without CS are 7672 (83.2%). This means that mothers are keen on tetanus prevention and hence have taken their injections. The odds ratio is 0.77 with a 95% confidence interval at 0.618 to 0.95. moreover, mothers were also asked if they had had any tetanus injections before, and 44% said yes for those that did not deliver through

CS and those that deliver through CS are 6.9%. More mothers also have never had tetanus injections before, that is 40.6% for those that deliver without CS and 5.0% for those that deliver through CS. The odd ratio is 0.95 (0.83-1.09) 95% confidence interval.

Table 9: Place of delivery against place of residence

Type of place of residence	delivery by caesarean section		Total
	no	yes	
urban	3836 (48.0)	811(64.9)	4647
rural	4151(52.0)	439(35.1)	4590
Total	7987(100)	1250(100)	9237

Source: Field survey (2022)

From Table 9, out of the 1250 mothers that deliver through CS, majority (64.9%) are people from urban areas. This may be because there is availability and access to health facilities that perform Caesarean Section. In the urban areas, there is the availability of health facilities that are better equipped whereas they also have the human resources in the many areas of expertise. With their experience, they are seen as good for the CS hence the likelihood of urban people getting CS. Whereas in the rural residence types, there are 439 mothers (35.1%). This may be the reason of lack of access and ready availability of facilities. While in urban communities, mothers choose where to deliver.

Table 10: Birth type against region of residence

region	delivery by caesarean section		
	no	yes	Total
Western	719(9.0)	112(9.0)	831
Central	488(6.1)	95(7.6)	583
Greater Accra	657(8.2)	195(15.6)	852
Volta	370(4.6)	78(6.2)	448
Eastern	640(8.0)	120(9.6)	760
Ashanti	900(11.3)	206(16.5)	1106
Brong Ahafo	779(9.8)	126(10.0)	905
Northern	1327(16.6)	132(10.6)	1459
Upper East	1159(14.5)	88(7.0)	1247
Upper West	948(11.9)	98(7.8)	1046
Total	7987 (100.0)	1250 (100.0)	9237

Source: Field Survey (2022)

The region with the highest birth is Northern Region with a frequency 1459, out of which 132 deliver through CS and 1327 are non-CS mothers. The upper East Region is the second highest with a frequency of 1247 followed by the Ashanti region with a frequency of 1106 mothers. The Brong Ahafo, Greater Accra, Western regions have 905, 852, and 831 total birth respectively.

Moreover, the region with the highest CS rate is the Ashanti region, which is 206 CS out of 1106 deliveries. This is 16.5% of the total CS in the ten regions. This could be attributed to the availability of resourced health facilities in the region. This is followed by the Greater Accra with 195 CS out of the 852 deliveries in the region. Overall, the region has 15.6% of CS deliveries. This as

well can be attributed to the two regions having developed cities and the availability of health care systems. Comparing the Greater Accra and the Ashanti regions, the difference in total birth is 254. And also, the difference in CS delivery is only 11. This means that CS is very common in the greater Accra region. The region with the least number of CS is the Volta region. Out of the 448 deliveries, 78 are through CS. Out of the total 1250, the Volta region has the least with 6.2%.



CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter summarizes the finding from the data analysis based on the objectives and the research questions. The main variable of interest here are when antenatal care was initiated, the contents of the antenatal care visits.

There are the conclusion and the recommendation part.

Major Findings

Initiation of Antenatal Care

This study sort to find out when mothers start their antenatal care at their clinics. There was a clear indication that majority of the mothers (69.32%) start their antenatal clinic within the twelve weeks of pregnancy. The World Health Organisation recommended that antenatal care initiation should be between week one to week twelve, which is the first trimester. Some studies about late antenatal care recorded that in Nigeria (82%), Uganda (83%), Thailand (73.8%) and Addis Ababa (59.8%) of mothers start their ANC after the first trimester (Wolde et al., 2018). These are attributed to low healthcare coverage. In this study, the late initiation which is mothers who start their antenatal care after the first trimester is 30.68%. This means that antenatal care visit is well encouraged in the case of Ghana as compared to Nigeria, Uganda, and Thailand (Wolde et al., 2018). There is a need for more education for mothers to be able to start their antenatal clinics as soon as possible as recommended by the World Health Organisation.

The reason for the antenatal care visit was also assessed. Majority (86.7%) stated checkup as the reason for their first antenatal care visit. This means that they either found out that they were pregnant and they decided to

confirm it at the health facility. Moreover, only 13% of the mothers visited the antenatal clinic because they were having some problems. According to some studies, mothers visit the antenatal clinic to avoid complications (Ala et al., 2021). Visiting the antenatal clinic will help rule out any problems and mothers who do that can identify complications with their pregnancy. This helps in a way that mothers who have serious complications can start planning for a caesarean section before they are due.

Content of Antenatal Care

Antenatal care (ANC) components, which include investigations and interventions on a pregnant woman by a Midwife, Nurse, or Doctor, are critical in preventing maternal fatalities.

ANC visits should include blood pressure monitoring, fetal growth monitoring, urine testing, iron-folic acid supplementation, tetanus vaccination, at least three doses of Intermittent Preventive Treatment with Sulphadoxine/pyrimethamine (IPTp), deworming after the first trimester, blood group typing if not done previously, HIV and syphilis testing.

However, while attendance at ANC visits may not immediately convert into receiving service components, they do influence the quality process, impacting following visits, cost of care, skilled delivery attendance, and eventual maternal-child mortality prevention.

The content of antenatal care shows the various treatment or observations and assessments that were done. This involves taking blood pressure, urine sample, tetanus injection, weight and drugs for intestinal parasites. Out of the 9237 mothers, majority of them had their blood samples taken and only 2.3% are excluded. In relation to the delivery mode, only ten

(10) mothers did not have their blood sample taken. The odd ratio is 0.98 with a 95% confidence interval of 0.25 to 3.83.

Concerning blood pressure, only 6 of those that delivered through CS had theirs not taken. Majority of those that deliver had their blood pressure checked. This means that it is part of the normal clinic routine for blood pressure to be checked. Urine sample was also taken to verify any urinal tract infections. This can also be used to confirm the pregnancy. Majority of the mothers who delivered through CS had their urine samples taken. There are 1236 mothers who deliver through CS that had their urine samples taken. The odd ratio is 0.39 with a confidence interval of 0.09 to 1.69.

Majority (1091) which corresponds to 13.5% who have delivered through CS know where to go when they have any complications as compared to the 6672 mothers that did not deliver through CS. The odds ratio is 0.98 at a 95% confidence interval of 0.41 to 2.30. There is a tetanus injection where 1140 (12.3%) of those that deliver through CS had theirs. Also, those that delivered through CS had less than 2% of the sample size without injection. The weight of the mother is as well checked to also help see if the baby is doing well. From those that deliver through CS, there were 1243 mothers that had their weights checked against 7960 in the non-CS group. The odds ratio is 1.92.

Generally, it can be seen that majority of the mothers who deliver through CS have utilized the antenatal care clinic except few. These few could be a result of the availability and nearness of health facilities to them. These cases are those that are transferred to the tertiary hospital for an emergency clinic. The rate of mothers who started antenatal care clinics in the first trimester is 10% (95% CI 0.62-1.05).

Conclusion

Women who started antenatal care clinics during the first trimester are less likely to deliver through caesarean section. Even though a majority of mothers start their ANC clinic with the first trimester, we must encourage mothers to start as early as possible with the first trimester. This can be advised that mothers should start the clinic immediately after they find out that they are pregnant.

The content of care was encouraging for many of the mothers except that for the few who could not be involved may be because of proximity and access to the health facilities. Moreover, this could be a result of unequipped health facilities that do not have the needed equipment for those processes. The common practices are sample taking, blood pressure, urine sample taking, taking of iron tablets, and tetanus are common among mothers. These variables have more than 90% of the participants responding a yes.

Henceforth, avoiding wrong views about the timing of antenatal care visits are important and the need to make education intense to educate mothers on the need to begin antenatal care during the first trimester.

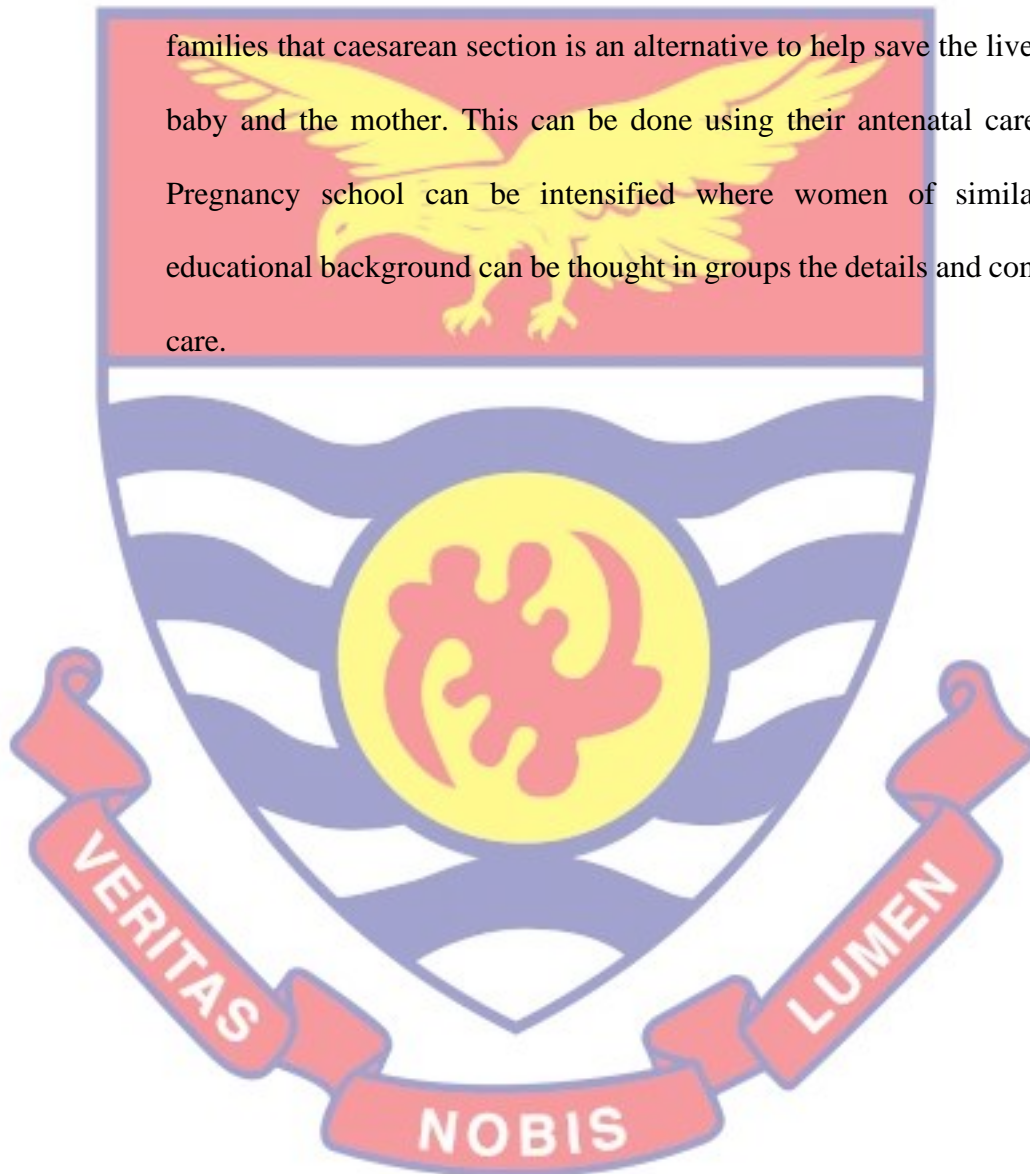
Recommendations

Based on the results, these are some recommendations.

- Firstly, antenatal care needs to be intensified as well as making health care available and accessible by all especially pregnant women and their babies. Mothers should be encouraged to attend antenatal care with the first trimester of their pregnancy. This can be done by collaborating with the community through community health centres, licensed chemical sellers to be able to refer pregnant women to these health facilities. For caesarean

section to be made a general alternative method for mothers, it is also recommended that during antenatal clinic visits, mothers will be shown illustrations and videos of the methods. This will allow them make a choice as to the method that they will choose.

- Secondly, there is the need to intensify education for women and their families that caesarean section is an alternative to help save the lives of the baby and the mother. This can be done using their antenatal care clinic. Pregnancy school can be intensified where women of similar ages, educational background can be thought in groups the details and contents of care.



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