

**UNIVERSITY OF GHANA**

**COLLEGE OF HEALTH SCIENCES**

**SCHOOL OF PUBLIC HEALTH**



**DETERMINANTS OF DEMAND FOR CESAREAN SECTION DELIVERY AT THE  
LEDZOKUKU-KROWOR MUNICIPAL ASSEMBLY (LEKMA) HOSPITAL**

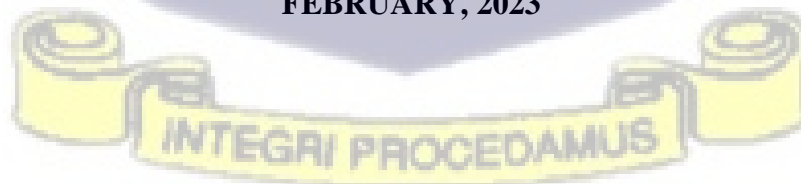
**BY**

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**THIS DISSERTATION IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON  
IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF  
MASTER OF HEALTH ECONOMICS DEGREE**

**FEBRUARY, 2023**



**DECLARATION**

This is to declare that this proposal is the result of my own research. Published literature of other research which have been cited have been duly acknowledged by means of referencing.

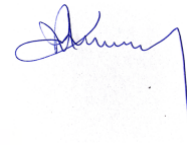
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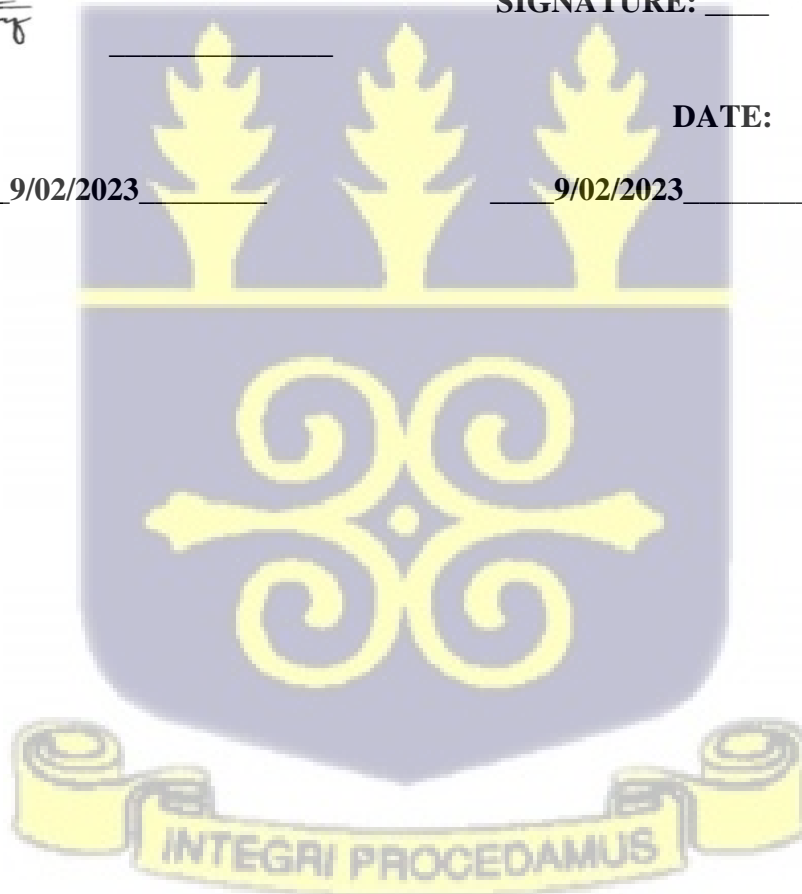
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## **DEDICATION**

I firstly dedicate this these to the Lord God Almighty. I dedicate it to the Management of Lekma Hospital and the clinical department who participated in this study. To my family and dear ones, I appreciate all of your support, encouragement and prayers. God richly bless you all.



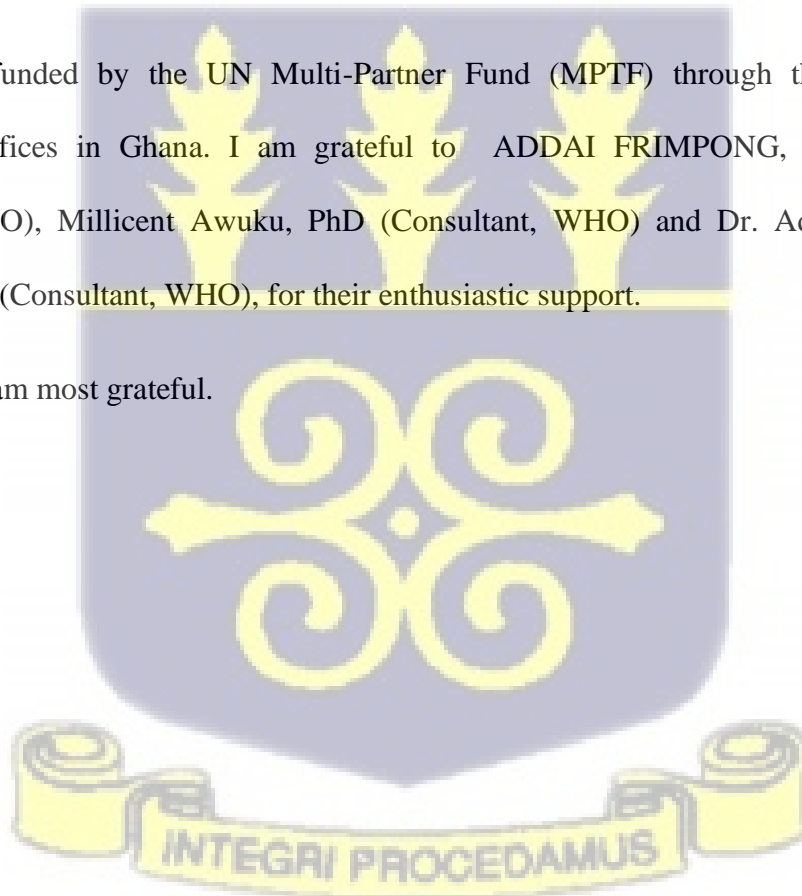
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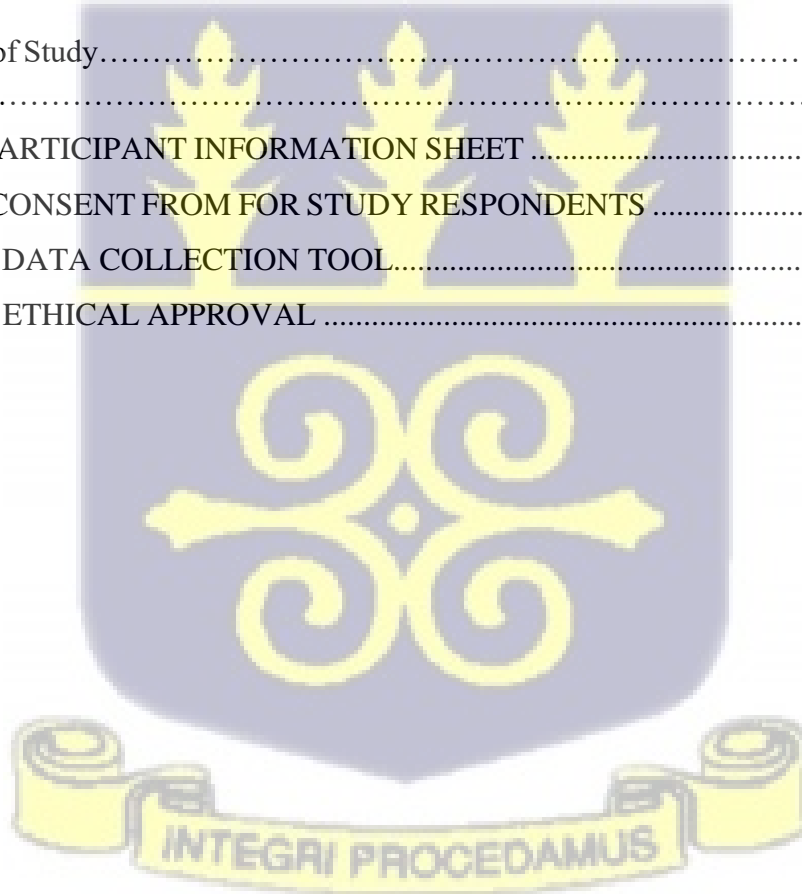


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### LIST OF ABBREVIATIONS

ACOG	American College of Obstetricians and Gynecologist
ANC	Antenatal Care
CPD	Cephalic Pelvic Disproportion
CS	Cesarean Section
CSR	Caesarean section rate
<b>GHS</b>	Ghana Health Service
HBM	Health Belief Model
HIRD	High Impact Rapid Delivery
LEMA	Ledzokuku Municipal Assembly
PEOM	Premature Rupture of Amniotic Fluid Membrane
EMONC	Safe Motherhood Initiative, Emergency Obstetric and Neonatal Care
TBA	Traditional Birth Attendants
WHO	World Health Organization



## ABSTRACT

The rise in caesarean section births has been a major source of concern for public health officials around the world. In most countries, the caesarean section rate (CSR) has gone above the World Health Organization's (WHO) recommended range of 10–16%. The Ghana Demographic and Health Survey, 2016-2021, Greater Accra region had the highest rate of Cesarean section (CS) deliveries (30%). Ledzokuku Municipal Assembly (LEMA) Hospital serving more clients. The specific objectives of the study were to: determine the proportion of Cesarean Section Rate (CSR) among mothers at LEKMA hospital and to assess factors associated with the demand for Cesarean Section delivery. The study design was an analytical cross-sectional study and the mixed method approach was used, to quantitatively and qualitatively generate primary and secondary data for analysis. The study population included mothers visiting the antenatal and post-natal care and health managers of the facility. A sample size of 374 of which 40 women attending the antenatal and postnatal clinic at the facility were interviewed and questionnaire was administered to 30 health managers. The inferential analysis was used to determine the predictors of the demand for CS. Over one-third of mothers 34% (130) were between 26-30 years of age and were married. In addition, 36% (136) of mothers were traders, hairdressers/seamstress and artisans. Also, less than one-third 27% (101) of mothers had secondary level education. The proportion of cesarean sections were 61% (55) elective with maternal conditions due to fetal conditions constituting 35% (39). Availability of obstetrician or gynecologist and maternal condition were found to be key determinants for the rise in CS at the facility. The study concludes that the rate of Cesarean Sections is 6 times the recommended and acceptable level of CS by the World Health Organization and the factors that influence the rise in CS rate at the facility are due to maternal

conditions. Efforts should be made to improve services that would improve upon vaginal deliveries.



## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background

The rise in caesarean section births has been a major source of concern for public health officials around the world. In most countries, the caesarean section rate (CSR) has gone above the World Health Organization's (WHO) recommended range of 10–16% (Betran, 2015). In high-income countries, caesarean section rate is 30.3% in the USA, 22% in the United Kingdom, 26% in Canada, 18% in France, 28% in Germany and 30% in Australia (Gibbons, 2010). In low-income countries, CSR is increasing on a yearly basis. For example, in Bangladesh, caesarean deliveries increased from 2% (2000) to 17% (2011); in India from 3% (1992) to 11% (2006) and in Nepal from 2% (2000) to 6% (2011) (Newman, 2014).

The rate of CS is connected to better maternal and perinatal results, as per a WHO review of Northern European countries (WHO, 2016). But this does not give any legitimate rationale to sustain caesarean birth rates higher than 16% in any nation, according to the WHO (Ostovar et al, 2010). Also tariffs above this are unsuitable and inappropriate, leaving patients and healthcare systems under financial strains (Mekonen, 2012). Nevertheless, a caesarean delivery rate of less than 5% shows that the demand for professional caesarean delivery services is unmet (Kahsay et al, 2015).

Low priority of boosting women's own strengths to deliver, adverse effects of common labor interventions, unwillingness to give the appropriate choice of vaginal birth, laid back behaviors about surgical procedure and variability in professional practice style, low awareness of injury more likely with caesarean section, and bonuses to practice in a way that is productive for providers all appear to contribute to the high caesarean rate (Amjad, et al, 2018)

Efforts to limit the number of Caesarean Sections in wealthy countries did not appear to be successful. Maternal age appears to be the strongest predictor of caesarean delivery for low-risk women's first birth, a factor that has continued to rise. The majority of women who have their first child by caesarean delivery will have all of their subsequent children by caesarean delivery (Harrison et al, 2016).

Caesarean sections, like any surgery, carry short- and long-term risks that can last for years after the delivery, affecting the woman's health, her child's health, and future pregnancies. Women who have inadequate access to comprehensive obstetric care are at higher risk.

According to Oonagh et al. (2018), cesarean delivery is linked to future infertility and various pregnancy risks, including uterine rupture, and stillbirth. Longer-term consequences, such as pelvic organ prolapse and urine incontinence, are directly associated to method of birth, according to Robson and De Costa (2017) in their article on C-section problems. Up to 20% of women will require surgery for these diseases.

A study discovered that Caesarean section rates vary based on local economic levels. The rate of Caesarean section in the Dominican Republic is 0.6 percent and 58.9 percent in South Sudan. Similarly, within countries, Caesarean section rates in this population were found to be lowest in the poorest areas 3.8% and greatest in the wealthiest areas 18.4% (Adeline et al., 2018). This disparity is due to the lack of a defined, internationally acknowledged classification system for monitoring and comparing caesarean section rates in a consistent and action-oriented manner (World Health Organization (WHO), 2015).

A study in Ghana by Manyeh et al. (2018) found that the overall C-section rate was 6.59%. Women aged 30–34 years were more than twice likely to have C-section compared to those less than 20 years and women aged 34 years and above were more than thrice likely to undergo C-section

compared to those less than 20 years. The odds of having C-section were 62% and 78% higher for participants with Primary and Junior High-level education. Participants who belonged to the richest wealth quintile were more than 2 times more likely to have C-section delivery. The authors concluded that age of mother, educational level, parity, household socioeconomic status, district of residence, and level of education of household head are associated with caesarean section delivery.

Rahman et al. (2018) found that factors such as the mother's age, obesity, living in an urban area, having a first child, her perception of the baby's size as being large, her husband's occupation, having more antenatal care (ANC) visits, getting ANC from private providers, and giving birth in a private facility were statistically linked to higher rates of C-section.

As a result, Caesarean sections should ideally only be performed when medically necessary, as they can result in significant and sometimes permanent complications, disability, or death, particularly in settings that lack the facilities and/or capacity to properly conduct safe surgery and treat surgical complications. Rather of aiming for a set rate, every attempt should be made to give caesarean sections to women in need (World Health Organization 9WHO), 2015).

The purpose of this study is to evaluate the factors that influence caesarean deliveries among mothers.

## **1.2 Problem Statement**

The World Health Organization's recommended Cesarean Section Rates (CSR) has been from 10% to 16% of the local population for the past 30 years. Despite this advice, global CSR has been rising in recent years. In a study by Adeline et al, (2018), it showed that variations in rate were observed at various degrees of local economic development. Caesarean section rates tended to rise with increased economic status and were lower in women who were poorer. The variation in

caesarean section rates was wider between study countries in the richest than in the poorest. The study also stated that the causes of different caesarean section rates between and within nations are intricate and situational. Low rates of Caesarean sections may be brought on by a shortage of trained medical personnel and medical infrastructure, the availability of user fees, or cultural perceptions about the benefits and safety of the procedure. A complex combination of elements at the individual, societal, and organizational levels is what causes the overuse of caesarean sections.

Fear of birthing agony, societal notions of luck and the destiny of birth dates at the individual level and also because the effects of vaginal delivery on the pelvic floor, sexual function, and physical appearance may affect women's preference and choice (Manyeh, 2018). The prevalence of caesarean sections has been linked to organizational factors such as clinician convenience, financial incentives, lawsuit fear, medicalization of childbirth, clinician staffing cultures, health insurance coverage and physical facility layout. (Adeline et al, 2018).

Though other research on Cesarean delivery have been conducted in Ghana, some of them have focused on socioeconomic and demographic characteristics linked with Cesarean delivery. Cesarean delivery in southern Ghana (Manyeh, 2018), as well as Ghanaian women's preferences for vaginal or Cesarean delivery postpartum (Danso et al, 2009), establishing the validity of women's self-reported emergency Cesarean delivery (Stanton et al, 2013), in Northern Ghana, as well as clinical indications, fetal-maternal outcomes, and Cesarean delivery predictors (Prah, 2017).

Despite this public health concern, research on caesarean section deliveries (CD)-related factors in many low- and middle-income countries, such as Ghana, is limited.

According to the Ghana demographic and health survey, 2016-2021, Greater Accra region had the highest rate of Cesarean section deliveries (30% as at 2021). A breakdown of the Greater Accra

region showed Ayawaso West as having the highest Cesarean Section rate of 50% followed by Ayawaso East with 40.8%, Korle-Klottey follows up with a rate of 38% and Ledzokuku was forth with a rate of 34.4%. The constituency with the lowest rate was Ga South with a rate of 4%.

Ledzokuku Municipal Assembly (LEMA) Hospital is the biggest and busiest hospital in the Ledzokuku-Krowor Constituency. It greatly contributes to the high rate of cesarean section delivery in the constituency.

As a result, the objective of this study is to determine Caesarean Section Rates (CSR) in Ledzokuku Municipal Assembly (LEMA) Hospital and the factors that influence the observed rates in order to inform policy.

### **1.3 General Objectives**

The general objective of this study is to determine the Cesarean Section Rates (CSR) and the associated factors at LEMA Hospital.

#### **1.3.1 Specific Objectives**

The specific objectives are to:

1. To determine the proportion of Cesarean Section Rate (CSR) among mothers at LEKMA hospital.
2. To assess factors associated with the demand for Cesarean Section delivery among mothers at LEKMA Hospital.
3. To explore health managers perceptions and attitudes toward monitoring and evaluating Cesarean Section Deliveries at LEKMA Hospital.

#### **1.3.2 Research Questions**

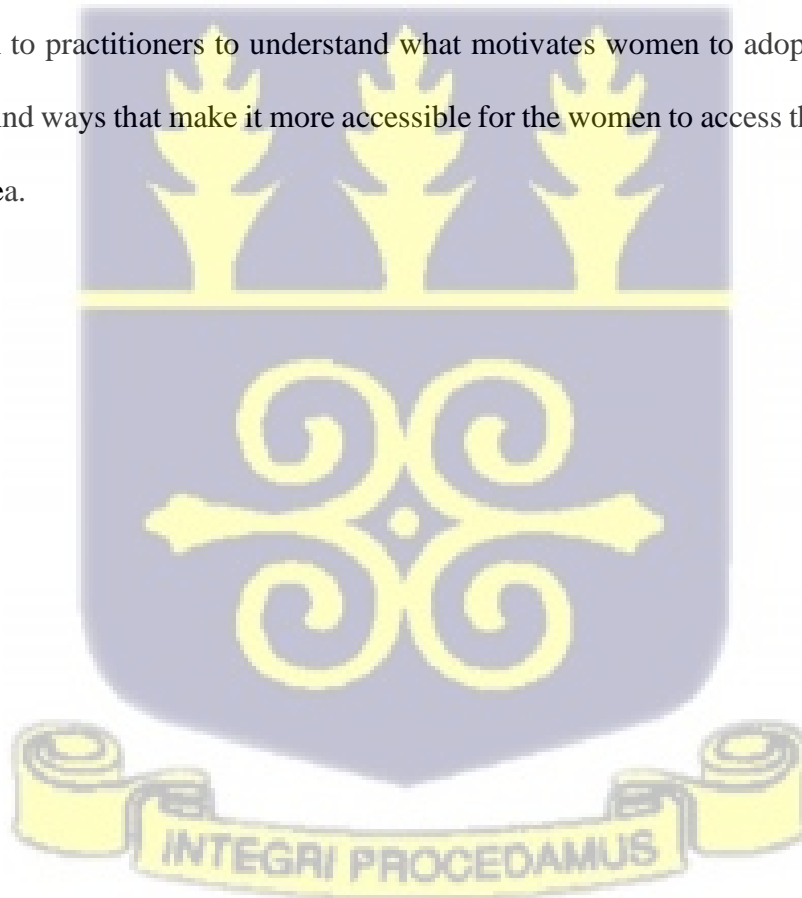
The research questions are:

1. What was the average Caesarean Section Rate (CSR) among mothers at LEKMA Hospital?

2. What are the behavioral determinants of Caesarean Section delivery among mothers at LEKMA Hospital?
3. What are the perception and attitude of health managers toward Caesarean Section deliveries?

#### **1.4 Significance of the Study**

The study significantly, after the findings, is expected to contribute to policy makers, practice and academia. Firstly, the finding of the study may make appropriate recommendation to help formulate policy by the Ledzokuku-Krowor Municipal Assembly (LEKMA) Hospital to manage cesarean delivery in the facility. Secondly, the research is expected to make appropriate recommendation to practitioners to understand what motivates women to adopt cesarean section delivery and to find ways that make it more accessible for the women to access the LEKMA health facility in the area.



## CHAPTER TWO

### LITERATURE REVIEW

#### 2.0 Introduction

The chapter provides information related to literature review. Basically, the concepts and related literature review are based on the study objectives.

#### 2.1 Background of Caesarean Sections

The concept of caesarean appeared to have been used by Guillimeeau a French obstetrician in 1598 to deliver live babies from dead mothers' womb (Pallasmaa, 2014). Historically, caesarean C-section from that time became a special subject of study which saw more people specializing to become surgeons (Cyr, 2006). There were high mortalities in C-section in 19<sup>th</sup> century but coming into the early and end of the 20<sup>th</sup> century, issues related to high maternal mortalities delivery begun to reduce in advance countries. The mortality was still higher compared to vaginal births (Callaghan, 2012).

Caesarean section (CS) is defined as obstetric medical intervention that is used to decrease fetal, morbidity and maternal mortalities (Amjad, Amjad, Zakar and Usman, 2012). Also, the C-S can be described as a surgical procedure on which incisions are made on the expecting mother's abdomen or uterus to assist baby deliveries or remove any dead fetus (Asuquo, Orazulike, Onyekwere and Odjegba, 2016). According to Betran, Ye, Moller, Zhang and Gulmezoglu (2016) the World Health Organization (WHO) has viewed C-section as medical plan for the treatment or management of pregnancy complications through improved accessibility, availability, and quality services provision in hospitals. Betran et al., (2016) noted that C-section has since been recognized globally and the trend continues to increase with massive variation within countries based on behavioral economics models rather than health belief models.

## 2.2 Pregnancy Complications and the Need for Cesarean Section

Studies in Africa related to complications and leading factors of cesarean section, have been attributed to Cephalic Pelvic Disproportion (CPD), Premature Rupture of Amniotic Fluid Membrane (PROM), fetal distress, breech presentation and multiple pregnancy are common factors associated with increased cesarean rates (Panditrao, 2018). Pregnancy complications and the need for cesarean section among women continue to increase, especially in developing countries like Ghana. Other scholars have indicated that factors related to location and accessibility of healthcare facilities have also contributed to C-section among women (World Health Organization, 2019).

Other factors associated with C-section is place of health, whether public or private facility and maternal age are reasons for C-section (Allen, O'Connell and Basekett, 2013). Some studies have also demonstrated that factors such as parity, maternal weight, birth weight and history of antenatal visit are associated with C-section (Francome and Savage, 2013). Also, multiple pregnancy, ante partum hemorrhage history, cord prolapse, mother HIV infection condition were found to be factors causing the increase of C-section (Lauer and Betran, 2017). Other factors such as anesthetic skills and improved safety obstetrics and attitudes towards C-section also contribute to the increase (Allen, et al., 2013).

The perception of infant, neonatal and child deaths manifest, almost in low income or developing countries. In Ghana for instance, healthcare provision or services during pregnancy and childbirth are necessary for the well-being and survival for both the infant and the mother (Ghana Health Service (GHS, 2018). For some time now, there have been improvement in maternal healthcare provisions due to the government's interventions to enhance services to prevent maternal mortality to achieve Sustainable Development Goal 3 (GHS, 2018). The country adopted the High Impact

Rapid Delivery (HIRD) for Safe Motherhood Initiative, Emergency Obstetric and Neonatal Care (EmONC) to demonstrate effective maternal healthcare delivery through the health insurance policy (GHS, 2018). Further, the initiative led to overall reduction in infant and children under five mortality from (155) deaths per (1,000) live births in the years 1988 to (52) deaths per (1,000), with 77 deaths per live births and 37 deaths per (1000) live births in 2017 in the country (GHS, 2018). According to Apanga and Awoonor-Williams (2018), the maternal mortality ratio in the country reduced from 760 per (100,000) live births in the year 1990 to 310 per (100,000) live births in 2017. Whiles the reduction in maternal mortality has been slow, this was attributed to the country's inability in achieving the Millennium Development Goal target of 190 per (100,000) live births in 2015 (Apanga and Awoonor-Williams, 2018).

The major challenge in achieving the MDGs was lack of effective primary care facilities like infrastructure to deploy qualified and skilled professionals, lack of logistics, equipment, and transportation such as ambulance services (GHS, 2018). According to the Ghana Health Service (2018) recent survey indicated that majority of pregnant women now access and receive antenatal and postnatal cares from improved health facilities and skilled professionals. In the same study, it indicated that high proportion of women received antenatal and postnatal care after the first few days of delivery (GHS, 2018).

### **2.3 Choice of Cesarean Section by Pregnant Women**

Many women have perceived the benefits associated with C-sections and maintained that a person's belief could influence the choice to engage in a particular health related behavior (Janz and Becker, 2014). Studies have shown that women who opted for C-section delivery, perceived childbearing associated with age, like women between the ages of 18 to 49 years would opt for virginal delivery compared to women above 49 years who may have not had a child in their live

time, would opt for C-section (Janz and Becker, 2014). Similarly, other scholars have noted that in advanced countries women have associated great importance to C-section delivery compared to women in low-income countries who believe that vaginal delivery afford faster recovery with early discharge (Loke et al., 2015). On neonatal health, majority of women have the conviction that vaginal childbirth is safe for the baby and mother, but others compared the repetitive examination of vaginal and fear of labour to be the underlying factor and preference for C-section delivery (Dursun et al., 2011).

Studies have revealed that women with maternal complications or fetal distress influence the mode of childbearing. The limitation of false apprehension of pelvic repeated examinations contributed to C-section in Turkey. (Loke et al., 2015). A study conducted in part of Turkey on a selected 840 women to determine their preference regarding vaginal birth or C-section. The study revealed that the perceived benefits of C-section and vaginal birth influenced mode of delivery (Yilmaz, Balbeji and Uludag, 2013). According to Yilmaz et al., (2013) the study showed that the reason for vaginal birth was attributed to swift recovery, healthy baby after labour, while others, also considered C-section delivery to be safer for babies and simple for women than vaginal births. Similarly, Loke et al., (2015) supported this outcome and said that in Turkey, the perceived benefits of delivery were choosing auspicious date for delivery and to plan for maternity leave influenced the choice for C-section delivery being the most convenient among some women in Hong Kong.

Historically, studies have shown that in the early seventeenth century caesarean section was done to save babies after their mother's death, within this era, there were no advanced medicine but were performed for prolonged or obstructed reasons (Lurie, 2015). Also, some C-sections were done for Placenta Previa and Eclampsia, problems related to women labour issues and later this was done for Fetal Distress, Placental Abnormalities and Mal-Presentation of Foetus (Pallasmaa,

2014). The beginning of the 21<sup>st</sup> century, saw the emergence of medication for C-sections globally, although there are controversies surrounding C-section because of maternal mortality and morbidity as compared to virginal deliveries (Pallasmaa, 2014). Some gynecologists or patients consider it to be safer to perform without medical symptom (Gunnervik, Sydsjo, Selling and Josefsson, 2008).

## **2.4 Behavior Economics Model**

The behavior economics model explains that women make decision on type of delivery to either opt for virginal or cesarean based on availability of healthcare interventions (Hou, Sabah and Iunes, 2014). The behavior of women is shaped by availability of information regarding interventions such as health insurance, professional doctors or modern medication based on impact these can have on their behavior (Hou, et al., 2014) related to the supply and demand for CS.

### **2.4.1 Supply and Demand**

Women behavior are influenced by availability and professional in the healthcare sector. Scholars have attributed the mode or choice of child delivery on women's beliefs to be generally, doctors' advice as the rising causes of C-section (Hou, et al., 2014). The theory explains why women make a decision on their preference on childbirth and how their judgment are based on availability of information on outcomes of cesarean-section or virginal deliveries (Rice, 2013). Also, pregnant women may think about the common cause of death and look for alternative choices that best fit them. Similarly, whether policy prescription is available to offer best healthcare services, when pregnant women have challenges to comprehensively make decision on C-section. This is because wrong choices can have many negative consequences on the outcome in the interest of the delivery option (Keeney, 2008).

According to Iiyasu, Abubakar, Galadanci and Aliyu (2010) study, husbands who were allowed to support their pregnant wives during labour reduced the use of medication like C-section to make vaginal delivery easier. Harrison and Goldenberg (2016) study on postnatal intervention in Pakistan to reduce maternal morbidities and mortalities concluded, that access to healthcare provisions in the country, had influence on C-section and vaginal deliveries. Ghosh (2011) indicated that there was possible correlation between C-section and vaginal mode of delivery, as cross-sectional study found in India, access to medical care contributed significantly to the proportion of C-sections births.

Similarly, Lauer, Betran, Merialdi and Wojdyla (2010) study in Brazil on determinants of women mode of C-section trends in advance countries concluded, that the greater accessibility to healthcare delivery and surgical obstetrics, the likelihood C-sections were performed because of the capacity of the healthcare systems. Hou et al., (2014) collaborated with the above findings with a study conducted in China on determinants of high C-section options. The findings established that economic levels created opportunities for majority of the populations to access better healthcare facilities in the country to caused C-sections to be alarming (Hou et al., 2014). Kottwitz (2014) study in Tunisia suggested that access to proper healthcare facilities was the driving force behind discrepancies in mode of deliveries and noted that irrespective of one's educational background access to obstetric services was key to determine C-sections rate. Many studies have revealed that in advance or middle-income countries private medical delivery have had tremendous impact on C-section delivery to the extent that more and more women now access these modes of deliveries (Belizan, Althaba, Barros, Alexander and Beliz, 2016).

Gebremedhin (2010) in a cross-sectional survey in Addis Ababa revealed that women who had children in private health facilities were twice more than those who gave birth in public health

facilities with C sections. Belizan et al., (2016) study on occurrence in C-sections in Latin America countries supported the above findings and noted that there were high proportion of C-section rates in private medical facilities compared to public facilities. Long et al., (2015) study revealed that there were more C-section in Mozambique public health facilities than private health facilities in the country. Also, the health status and neighborhood characteristics where women resided, have influence for C-section or vaginal delivery option (Adamba, 2013). The research findings in Mozambique suggested that living in deprived environment had an adverse impact on the lives of pregnant women to access better healthcare interventions (Adamba, 2013). This influenced the selection and variation on mode or choice of delivery with vaginal or C-section but more importantly, infant mortality, contraception usage and maternal mortality are prevalence in these areas (Yebyo, Gebreselassie and Kahsay (2014).

#### **2.4.2 Costs of Deliveries**

The behavior of women is shaped by cost of cesarean section and virginal deliveries. The health expenditure on caesarean section is growing rapidly, representing 10% of global gross domestic product (Xu, Soucat and Kutzin, 2018). In Brazil, for instance, public and private healthcare systems from 2010 to 2017 ratio on expenditure on cesarean section has grown from 8% to 9.2% (Silveira, 2019). The case of the United States for instance, based on the Agency for Healthcare Research and Quality, findings revealed, issues related to cost of C-section on neonatal and maternal admission represented 20% than hospitalization (Agency for Healthcare Research and Quality, 2011). The average cost of C-section reached 1,590.00 dollars per section delivery, as compared to vaginal delivery which cost about 131.00 dollars (Truven Health Analytics, 2020). Also, according to Global Data (2015) most of the rising cost is associated with the rise in demand for C-section delivery, which has been seen as better clinical and maternal outcomes (Etringer,

Pinto and Gomes, 2019). This is related to increase in C-section with higher rates of admissions of newborns in intensive neonatal care and human resource assistance (Etringer, Pinto and Gomes, 2019). The demand for C-section increased from 3.7% to 5% due to parturient practice. This has reduced maternal mortality with a proximately 7% of amniotic embolism related to incidence of abnormal placental cases (American College of Obstetricians and Gynecologist, 2014).

Again, despite the rising cost of C-section, the rate of this mode of delivery has risen among countries because of the idea of safe rate, from 1996 with a rate of 18% this has risen to 33% in 2011 in developed countries. In Africa, there was an increase in C-section in both public and private facilities. The C-section increased from 40% in early 1990s to 55% in 2011, with the private hospitals accounting for 80% C-section delivery (Truven Health Analytics, 2020). Other factors have been considered to increase cost of C-section, notably, administrative location of facility, demand, technology and unexpected childbirth like anoxia (Vogt, Silva and Dias, 2014). According to American College of Obstetricians and Gynecologist (2014), the cost of vaginal delivery has a lower rate compared to C-section in risk low pregnancies, even though C-section has relative worse outcomes. Research has revealed that vaginal birth is associated with good outcome (Healthcare Payment Learning and Action Network, 2020).

### **2.5 The Health Belief Model (HBM)**

The model assumes that there is the need for health professionals who wish to improve public health to understand reasons why people opt or adopt certain behaviors and this has been used to determine why some women opt for C-section delivery (Loke, Davies and Li, 2015). Also, the HBM emphasized that people who engage in health-related behaviors are influenced by one's perception, severity, susceptibility, benefits and barriers (Loke, et al., 2015).

According to Rahmati-Najarkolaei, Eshraghi, Dopeykar and Mehdizadah (2014) the model is used to understand how women beliefs influence childbirth and this constitutes important aspect of international health policy on maternity because of the side effects babies delivered by CS suffer. The beliefs in the health facility enable women to make health related choices and these manifest due to information available to them, when they seek or get advice from peer regarding childbirth. Similar to relatives, healthcare practitioners or professionals are able to inform expected mothers on their medical conditions and what they have heard themselves will influence the choice of either C-section or vaginal deliveries (Orji, Vassileva and Mandryk, 2012).

According to Buyukbayrak, Kaymaz, Kars and Karsidag (2010) actions taken by some women were mainly, attributed to the rising C-section option among women. In a study using cross-sectional survey of 797 pregnant women in Iran, revealed that advice from physicians recorded the highest form of C-section. Also, women's belief and perception were shaped because of information they got from other sources concerning option for vaginal or C-section delivery (Buyukbayrak et al., 2010).

### **2.5.1 Susceptible to Risk**

Women predispositions are a number of factors that determine the choice of Cesarean sections. For instance, when a woman has a notion of illness like medical condition, with the firm conviction to be susceptible or at risk of a condition, she is likely to adopt a particular health related choice to reduce the fear or risk (Munro, Lewin, Swart, Volmink, Redding, Rossi and Evans, 2007). This susceptibility for instance, could be attributed to previous experience of childbirth, could influence the preference of the subsequent childbirth (Loke et al., 2015). More recently, studies have revealed or suggested that the most reason behind the choice of C-section delivery was because of the perceived vaginal and labour pain, resulting for C-section choice of delivery

(Akintayo, Ade-Ojo, Olagbuji, Akintayo, Ogundare and Olofinbiyi, 2014). Comprehensive research of 319 women in postnatal intervention to determine the choice of childbirth, revealed that susceptibility was the main factor affecting the mode of child delivery (Loke et al., 2015). It shows that negative or weak physical conditions made women not to have vaginal birth, upon advice from a health professional (Loke et al., 2015).

The perception on the severity of concentration of the medical condition or adverse outcomes makes women to opt for the choice of childbirth (Dursun, Yanik, Zeyneloglu, Baser, Kuscu and Ayhan, 2011). If there are serious complications in connection with this form of childbirth, women are likely express fondness for an alternative mode of delivery (Dursun et al., 2011). Women who perceived risk and pain for virginal delivery accounts for the preference in C-section because of the perceived severity attached to maternal mortalities (Dursun, et al., 2011). Similarly, according to Lumbiganon, Laopaiboon, Imezoglu, Souza (2010) the mode of vaginal delivery is not without risk as perinatal and maternal complications are associated with vaginal delivery have been documented as prolong labour and pelvic organ prolapse. Also, there suggest that severity perceived by some women on vaginal delivery with the notion that “the baby may suffer” influence their choice for C-section delivery (Lumbiganon et al., 2010).

### **2.5.2 Access to a Health Facility for delivery**

Women access to specific health facility influence expected mothers to follow specific mode of health behavior (Janz and Becker, 2014). The reason to make a choice to opt for vaginal delivery is based on availability of health facilities which motivate one from opting for vaginal birth (Janz and Becker, 2014). According to Einarsdo-Ttir, Kemp, Hagggar, Moorin (2012) in Hong Kong, mode of C-section deliveries without health indications are only available to some private hospitals because of policies in public hospitals on low financial status which serves as barriers to opt for

C-section delivery. Some studies show that issues related insurance covers are critical elements in maternal choice of delivery such that insurance covers motivate women to opt for C-sections in private hospitals without medical indications (Einarsdo-Ttir, 2012).

## **2.6 Conceptual Framework of Behavioral Economics for Caesarean Section**

There are several factors that influence a mother's choice for Caesarean section, this tends to influence the Caesarean Section Rate (CSR) directly or indirectly. The relationship between those factors and a Caesarean Section Delivery is depicted in the conceptual framework. In the conceptual framework, socio-economic, policy regulation, demand and supply, induce factors and intervening variables, all contribute to the final mode of delivery of the mothers. These tend to determine whether the mothers will deliver by Caesarean section or not by (Vaginal birth) hence directly or indirectly affecting Caesarean Section Rate (CSR). There are some intervening factors like previous caesarean section, fetal distress and mal-position of fetus that can also affect the decision whether to have a caesarean section or not as shown in Figure 1.

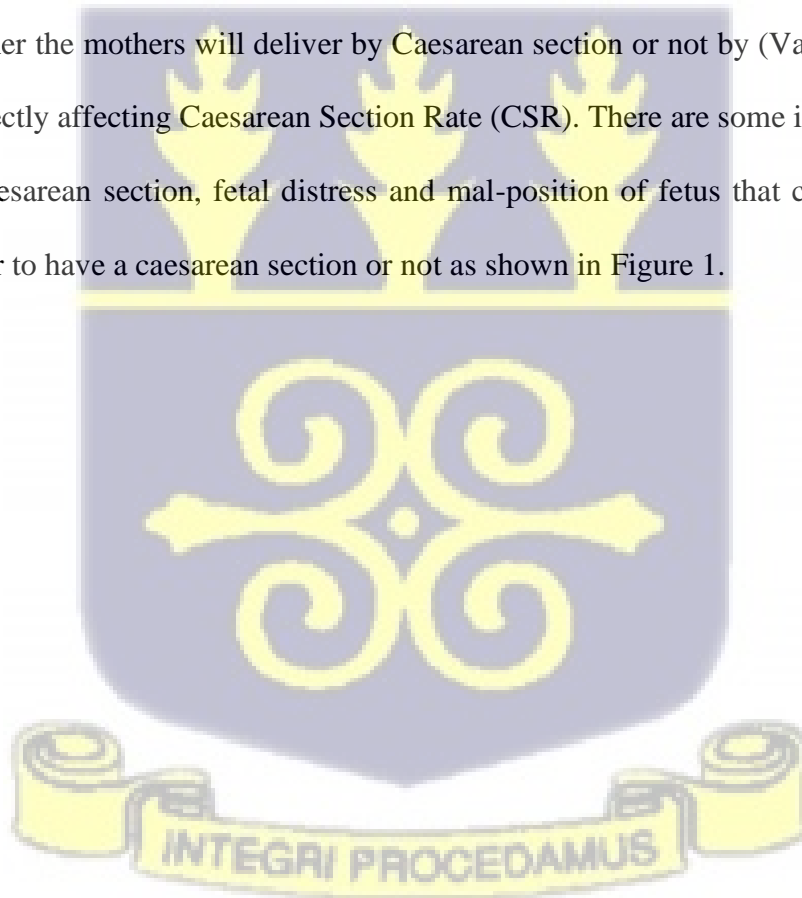
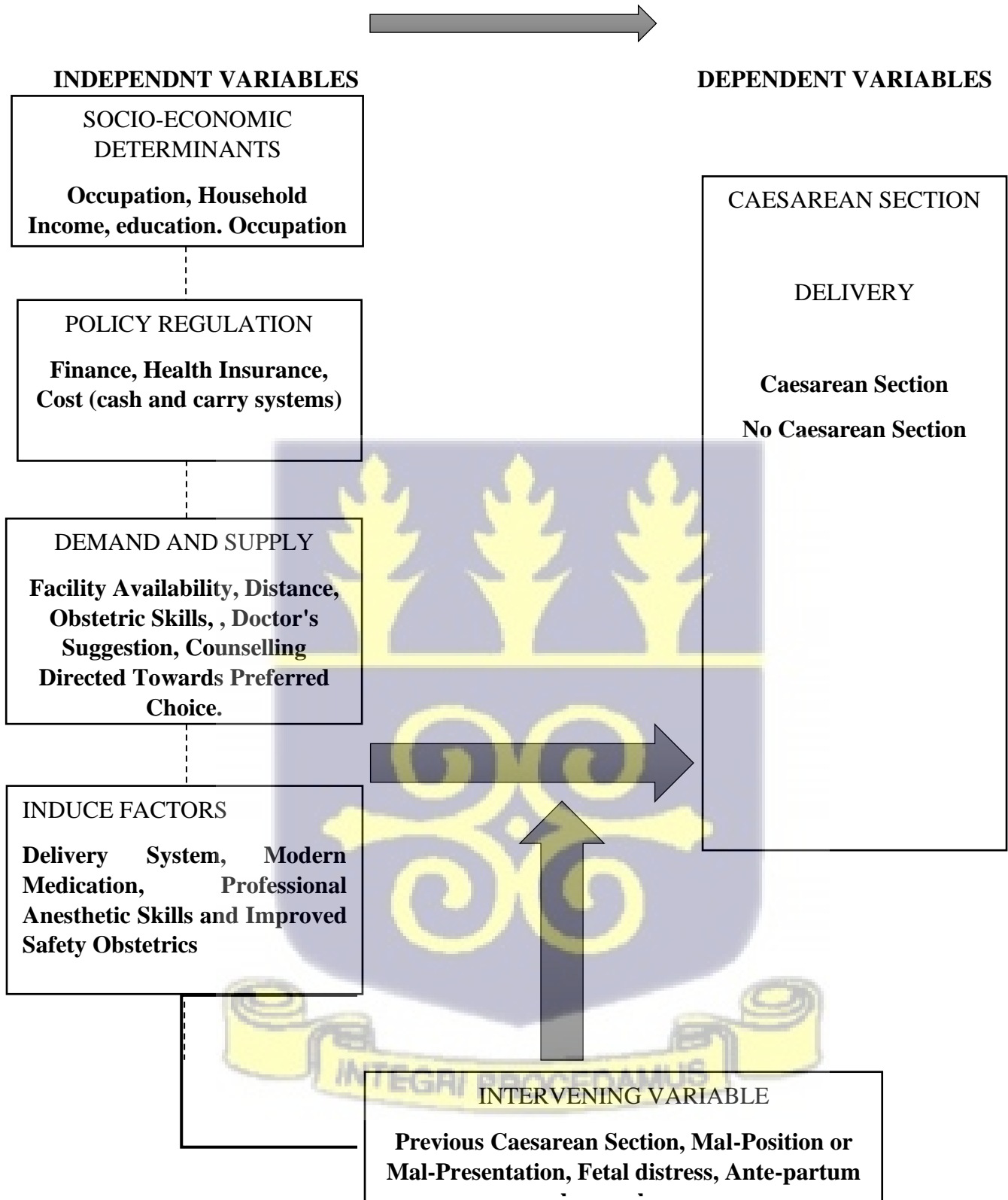


Figure 1: Framework of Behavioral Economics Determinants of Caesarean Section



### **2.6.1 Socio-Economic Determinant**

Studies have considered socio-economic factors that influence alternative decision and behavior towards Cesarean section. Women look for medical services that best fit their interest based on their income levels. The behavior of pregnant women choices can largely be influence by socio-economic levels within a particular society. The analysis of cost to its benefit and patterns of individual resources in the context of healthcare delivery are important aspect that informed women decision (Samuelson, 2017). Also, whether the provision of services reflect the same income or economic levels of the women. The healthcare facilities are equilibrium to pregnant women choice for either virginal or C-section delivery. For instance, the improvement in healthcare delivery can be of benefit on the alternative choices to either opt for one delivery method. The framework focuses on how income levels exit to match the demand for healthcare delivery.

### **2.6.2 Policy Regulation**

Women choice and behavior are largely influenced by the availability of flexible state social policies, to cater for the less privilege and disadvantage pregnant in society. Also, healthcare provisions such as “cash and carry” or free child delivery best fit the pregnant women delivery. How healthcare policy regulation like the health insurance has been seen to have contributed to the increasing choice to opt for C-section by pregnant women in the country. This is because the High Impact Rapid Delivery (HIRD) and Safe Motherhood Initiative, Emergency Obstetric and Neonatal Care (EmONC) in Ghana, demonstrated effective maternal healthcare delivery through the health insurance policy (GHS, 2018). Further, the initiative led to the overall reduction in infant and children under five mortality from 155 deaths per (1,000) live births in the years 1988 to 52 deaths per (1,000) with 77 deaths per live births and 37 deaths per (1000) live births in 2017 in the

country (GHS, 2018). This saw improvement in access to healthcare in maternal antenatal and postnatal care services to reduce maternal and infant mortalities in the country. The availability of policy framework on free delivery through health insurance schemes influence the choice for C-section delivery, compared to virginal delivery.

### **2.6.3 Supplier Induce Factors**

The most relevant aspect that induce or motivate pregnant women to make informed decision to either opt for C-section or virginal delivery is the provision of quality healthcare delivery systems. The quality of resource availability like professional obstetrician or anesthetic skills either public or private facilities influence the choice of pregnant women delivery. Also, the alternative type of financing method that are available just like the free health care system are the contributory factors. Similarly, the rational of the individualism merit on type of delivery have been found to induce patient choice to opt for a particular facility or care. The structure of a healthcare delivery and its related activities have also been found to induce pregnant women in their quest for baby delivery.

### **2.6.4 Demand and Supply**

The demand and the need for cesarean section have been found to be related to supply. The absence of medical facility will certainly influence the type of childbirth that pregnant women would opt for either being it virginal or C-section delivery. Also, the specific facility and professional availability influence the choice and decision of these women, to extent that area where there are only Traditional Birth Attendants (TBA) available, influences their preference by pregnant women in such area. Within modern or urban areas characterized by qualified and skill professionals like gynecologist or obstetricians, also influenced choice and preference of childbirth of these pregnant women. Other demand and supply factors are the availability of referral healthcare facilities, these facilities provide alternative choices for pregnant women to make decision based on closeness and

payment systems. The utilization of any healthcare is largely based on its availability, such as the facility and qualified professional and this influences the choice for C-section or vaginal delivery.

### **2.6.5 Intervening variables on demand for cesarean delivery**

The intervening variables are characterized by many conditions. Pregnancy complications are leading factors of cesarean section delivery. When pregnant women have complications such as Cephalic Pelvic Disproportion (CPD) and Premature Rupture of Amniotic Fluid Membrane (PROM) based on these, obstetricians could advise pregnant women to opt for C-sections. Also, conditions related to fetal distress, breech presentation and multiple pregnancy are common factors that are associated with increased cesarean rates (Panditrao, 2018). Other scholars have indicated that factors related to location and accessibility of healthcare facilities have also contributed to rise in C-section among women (World Health Organization, 2019). Similarly, the age of the maternal mother is an intervening variable influencing the choice for C-section. The perceived childbearing age among women has been found to be associated with the choice of C-section, such that when the pregnant women or expected women is above 49 years without any child before, would certainly influence the option for C-section (Janz and Becker, 2014).

### **2.6.6 Cesarean Section**

The increasing cesarean section is attributed to an intervening variable characterized by many conditions of expected pregnant women. The healthcare economics is concerned with provision and alternative behavioral choices on consumption of medical services for pregnant women child delivery. The increasing reasons for many opting for C-section delivery is the presumed safer baby delivery without prolonged processes of vaginal delivery (Yilmaz et al., 2013). These intervening variables like the age of expected mother and medical history continue to be variables that affect the increasing C-section in the country.

## 2.7 Empirical Review on Cesarean Section Rate (CSR) among Mothers

The proportion of caesarean section trend from early 1990s to 2014 among women globally, have significantly increased from 12.4% to 19.1% with annual average rate of 4.4% (Betran, Moller, Zhang, Gulmezoglu and Torloni, 2016). The Caesarean Section (CS) rates, according to studies, approximately, 27% of all birth recorded through C-section were from developing countries (Betran, et al., 2016). Estimates from Caribbean countries and Latin America show highest caesarean section delivery of 40.5%, with Northern America having 32.3%, Europe 25%, Oceania 31.1%, Africa 7.3% and Asia 19.2%. (Jonanne, Kristina, Steinsvik and Pun, 2016). Also, around the globe, out of 864 hospital births, ninety-one (91%) were C-sections with 9% been virginal delivery in advanced countries. Significant factors which accounted for C-sections were prolong delivery 24%, fetal distress 26.4% and abnormal fetal 19.8% (Jonanne et al., 2016).

Similarly, studies carried out in rural areas in Nepal, within a period of one year indicated that there were about 864 deliveries of which 91 were C-sections with rate of 9.5%. Also, 59.3% of women had nulliparous and 38.5% multiparas (Jonanne et al., 2016). The study shows that the highest parity among older women was 8%, followed by 1.7% of parity among younger mothers between the ages of 17 and 41 years (Jonanne et al., 2016). Another study, which examined the history of baby delivery in Malaysia, found that women with the highest percentage of single delivery was 38.9% of which half of the women 52.9% had experienced previous C-sections or repeated C-section (Rezaie, Torkashvand and Karami, 2014). For instance, 7.5% were elective C-section based on mothers' request, 6.1% meconial stained, 5% fetal distress and 4.5% breech presentation (Rezaie et al., 2014).

Becher and Stokke (2013) study in Tanzania found that there was a total of one thousand one-hundred and sixty-seven (1167) births at the St. Joseph hospital, of which 212 were C-sections, out of which five were stillbirth. Another study in the same country revealed that there were caesarean section prevalence of 27.6%, among mothers between the ages of 16 to 45 years. Cephalopelvic disproportion being the leading cause. Also, 18.9% being previous C-section, 12.5% fetal distress, 7.1% mal-presentation or malposition and 6% antepartum hemorrhage (Ayano, Geremew, Beyene and Muleta, 2015).

According to Ayano et al., (2015) study in Nigeria, 68% of deliveries constituted maternal indications, 32% fetal and 2.2% for both fetal and maternal indications. Other factors that accounted for rise in C-sections were medical choice of couples and patients who opted for the method based on financial, location, availability of facilities and specialist etc (Oyewole, Umar, Yayok, Shinaba, Atafo and Olusanya, 2014). Research in Iran revealed, that the major influence of C-section was mal-presentation which were indications, as most babies had transverse or breech presentation with mal-presentation being the term used (Rezaie et al., 2014). According to Gjonej, Poloska, Keta, Delija, Zyberaj and Bezhani (2015) the increase of indications, which contributed to more caesarean birth were 9.2% preeclampsia, 13.9% fetal suffering, 9.8% premature rupture of membranes and 36.5% indications were influence by previous delivery of the same method.

Spontaneous vaginal birth among mothers have long been considered as vital measures in reducing caesarean section delivery rate in both developing and developed in the world. With good management of patients this resulted in about 80% successes of normal vaginal delivery (Long, Kempas, Madede and Klemetti, 2015). There are a number of factors that account for the vaginal delivery in each country. According to Long et al., (2015) study in Malaysia, for instance, on

factors that influence vaginal delivery were individual, institutional and community levels factors were found to have accounted for vaginal delivery in the country.

The maternal age considerably influences Caesarean section. The age is a factor to determine the choice of delivery, or impact on current trends of C-section deliveries across the globe. Research suggests that C-section increase due to maternal age and serves as risk factors for C-section delivery (Smith, Wijk, Gouw and Duvekot, 2012). A study conducted to assess the risk and cost factors in C-section deliveries in Cameroon revealed that there was significant correlation between options due to extreme mother's age among older expected women (Tebeu, Mbouou, Halle and Kongnyuy (2017). The study revealed that out of 125 women who undergone through C-section, mothers ages between 39 and above were at higher risk to have normal delivery. Also, Long et al., (2015) cross sectional research conducted in China among expected mothers, revealed that age was a determinant of C-section delivery choice and a significant predictor. Similarly, a study was conducted in Japanese hospitals to examine factors that account for high C-section rates in selected hospitals over some period. The study found that there was significant correlation with the advanced age of mothers and caesarean (Suzuki, 2014).

Also, wealth index within households has been used to describe factors that afford options for C-section and vaginal delivery (Arsenault, Fournier, Philibert, Sissoko and Coulibaly, 2013). The cost of C-section delivery was disastrous for poor women within households in the African sub-region as compared to vaginal delivery. Even though the effects of C-section delivery have not properly been evaluated (Gartoulla, Liabsuetrakul, Chongsvivatwong and McNeil, 2012). Though there are availability of delivery exemptions for some countries on health insurance schemes as modalities for vaginal choice but when delivery method becomes complicated the alternative results in C-section (Meessen, Hercot, Noirhimme, Ridde and Tibouti 2011). Studies suggest that

women who opt for C-section were from rich homes compared to women from middle- or low-income households, as women from poor background were less likely to opt for C-sections (Long et al., 2015). Raisanen, Gissler, Kramer and Heinonen (2014) study in India on whether C-section option was associated with economic status revealed, that vaginal deliveries were higher in poor households compared to rich homes.

Similarly, the relationship between individual women factors that influence vaginal or C-section delivery, according to Yassin, Saida and Yassin (2012) cross sectional study in Egypt shows that women who had less than two births were more likely to experience C-sections than women with more parity. Also, a study in Cairo, established that women who were admitted in hospitals and due for labour, showed that women with primiparous played a crucial role in high rates of C-sections in the country. Another study in Algeria revealed that extreme parity was associated with mode of C-section delivery because women who had C-sections were likely to have multiparous and primiparous as possible risk factor to opt for C-section (Tebeu et al., 2016). Similarly, a study in Iran revealed, that women were likely to experience C-section based on multiparous because parity and had significant correlation with vaginal or C-section deliveries (Tebeu et al., 2016).

Scholars have tried to link women working status to vaginal delivery and indicated that there were issues related to the choice of baby delivery. Buyukbayrak et al., (2010) study findings revealed that majority of the women related vaginal delivery to social status. Similarly, Ghosh (2010) conducted a study using National Family Health Survey in India on reproductive age, found that women working status was a significant factor on the choice of mode of baby delivery in antenatal clinics.

## 2.8 Summary of the Literature

The literature review indicates that more studies have been conducted on complication factors and the rise in cesarean section. These factors were attributed to medical conditions or history of pregnant women and accessibility of healthcare were contributing factors (World Health Organization, 2019). However, a few studies have been done to examine how education and lack of logistics, equipment, and transportation like ambulance services influence mode of child delivery and these areas has to be examined. Also, the baby weight with expected mothers have been well examined in the choice of child delivery.

The review indicates that the choice of cesarean section by pregnant women have been found to be associated with its benefit (Janz and Becker, 2014). Studies have shown that women who opted for C-section delivery, perceived childbearing associated with age, like women between the ages of 18 to 49 years would opt for virginal delivery compared to women above 49 years (Janz and Becker, 2014). Literature on parity as individual women factors, for vaginal or C-section delivery have been assessed, according to Yassin, Saida and Yassin (2012) study in Egypt, found that women who had less than two births were more likely to experience C-sections than women with more parity.

Similarly, the proportion of caesarean section trend in women globally, have significantly been examine. These studies have revealed that the annual global average of cesarean rate continues to increase from 12.4% to 19.1% (Jonanne, Kristina, Steinsvik and Pun, 2016). The proportion of Caesarean Section (CS) rates have been recorded with approximately, 27% mostly from developing countries (Betran, et al., 2016). The estimates from Caribbean countries and Latin America show the highest caesarean section delivery of 40.5%, with Northern America 32.3%, Europe 25%, Oceania 31.1%, Africa 7.3% and Asia 19.2% (Betran, Moller, Zhang, Gulmezoglu and Torloni (2016).

However, a few studies exist on socioeconomic levels and C-section child delivery. The wealth index within households has been described to be a factor when it comes to affording the option of C-section and vaginal delivery (Arsenault, Fournier, Philibert, Sissoko and Coulibaly, 2013). The cost of delivery in C-section can be disastrous for poor women within households in the African sub-region as compared to vaginal delivery (Gartoulla, Liabsuetrakul, Chongsvivatwong and McNeil (2012). How this cost influence the choice for C-section has to be expanded to understand how socioeconomic levels promote the option for C-section particularly in Ghana.

Additionally, literature have found that women perceived susceptibility risk, access to facility and previous experience of childbirth, influences the preference of subsequent childbirth to opt for C-section (Loke et al., 2015). Similarly, research shows that few studies exist on perceived policy regulation and demand and supply (availability of professional and structures) and these factors contributed to the choice for C-section delivery in urban areas. Research on policy regulation, demand and supply would assess how these factors promote C-section delivery.



## CHAPTER THREE

### METHODOLOGY

#### 3.0 Study Methods

The chapter provides information on the methodology used for the research. This section reviews the various methods and variables adopted for the research.

#### 3.1 Research Design

This was an analytical cross-sectional study. The research approach adopted was the mixed method approach using the triangulation mixed study design in order to obtain primary and secondary data to complement each information collected. This approach best addresses the research objectives (Creswell, Plan and Clark, 2013). According to Sousa, Driessnack and Mendes (2007) the use of the mixed method was based on the shortcoming of both the quantitative and qualitative data collection approaches. Doyle, Brady and Byrne (2009) stated that both quantitative and qualitative methods have advantages and disadvantages. The researcher explores the qualitative data to better understand comprehensively, participants experience on cesarean section and to quantitatively, convert participants understanding statistically to be meaningful (Doyle et al., 2009).

The mixed method was appropriate to help the researcher gain understanding on complex issues on pregnant women's choice on mode of baby delivery. The method integrates and complements quantitative study. Firstly, the quantitative approach helped to identify key trends of cesarean rate among participants for the study. Mostly importantly, researcher needed to examine mode of delivery among expected mothers at the facility (Creswell, et al., 2013). On the other hand, the qualitative approach helped to assess and understand the driving forces of C-section rates and lived experiences of these women. The method gave the opportunity to directly complement each data to compare qualitative and statistical findings of the study (Creswell, et al., 2013).

The method allowed the study to generate two basic sources of data. The quantitative generated secondary sources of data at the healthcare facility and the qualitative also generated primary source of data on in-depth life experiences of participant's belief on mode of delivery at the Ledzokuku Municipal Assembly (LEMA) hospital. The LEMA healthcare facility was the only government facility that served the inhabitants of about 217,304 population and areas outside the municipality. The facility also serves as referral hospital for many healthcare facilities and polyclinics for all baby deliveries (cesarean section or virginal) and are attended to by doctors and midwives in the healthcare facility.

### 3.2 Study Area

The Ledzokuku municipality has a population of 217,304, representing the Greater Accra Regions population 5.7%, of which men constitute 47.9% and women 52.1% of the total population (Ghana Statistical Service (GSS, 2020). The marital status in the municipality, about 40.8% of the population age 12 years and above are married, 6.5 % have never married, 3.8% are in nonsexual relations, 2.9% divorced, 2.6% separated and 3.2% of the population have never married. Also, women between 25-29 years are married.. On education, 92.2% of the population, those who are 11 years and above are literate. The population 15 years and above 49.6% are self-employed, with 69.7% in the private informal sector, 19.2% in the private formal sector represents and 9.5% in the public formal sector services (GSS, 2010).

### 3.3 Health Service Organization

The LEMA Hospital has a 100-bed facility with special services, such as radiological and laboratory facilities. The facility staff was made up of twenty-two (22) doctors of which nine (9) were specialists with over two hundred (200) nurses in all the various units of the facility. The

facility served as a municipal hospital for Teshie and Nungua environs. The facility delivers elective and emergency cesarean section.

### 3.4 Study Population

Kumekpor (2008) defined the population as the entire units or number of phenomena under research investigation, who exists to be observed. The target population of the study was women who have had cesarean section and attend antenatal and postnatal care at the Ledzokuku Municipal Assembly (LEMA) hospital from 2020 to 2022. The total deliveries in the Ledzokuku Municipality was 5,938 of which virginal delivery was 3,462 representing 58.3% and cesarean section 2,476 representing 41.75% in the year 2023. The target group were women who have had cesarean section at the LEMA hospital as the population (Ghana Health Service, 2023).

### 3.5 Study Variable

**Table 3.1 Study (Independent and Dependent Variables)**

Independent Variable	Dependent Variable
Maternal Age	Cesarean Section
Education	Still Birth
Wealth Index	Live Birth
Marital Status	
Belief	
Parity	
Antenatal Care	
Complications	

Supply and Demand	
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### **3.6.1 Independent Variable**

The study independent variables are factors that may have influenced child birth behavior of mothers at the health facility.

#### **3.6.1.1 Maternal Age**

The maternal age refers to the date of birth and the date at which women conceived, those in their prime reproductive and those reaching the end of reproductive age and serves as risk factors for C-section delivery (Smith, Wijk, Gouw and Duvekot, 2012).

#### **3.6.1.2 Education**

This is considered as the educational attainment of the women and how the awareness received influence the choice of baby delivery. Mothers who have attained higher education as compared to those who have not experienced formal education, have different perception toward the choice of either C-section or vaginal delivery.

#### **3.6.1.3 Wealth Index**

The wealth index refers the classification of living standard and household's assets of the women. The economic status has been found to influence the choice of vaginal or C-section delivery (Buyukbayrak et al., 2010).

#### **3.6.1.4 Marital Status**

The marital status refers to the original category of the mother union, either being single, separated, married or divorced to a man.

#### **3.6.1.5 Belief**

This refers to susceptibility on severity of child birth, perceived by pregnant mothers on alternative choices to either opt for C-section or virginal delivery. Also, anything attributed to previous experience of childbirth, which influences preference of subsequent childbirth (Loke et al., 2015).

#### **3.6.1.6 Parity**

This is referring to the number of children given birth to by a woman. The study classifies (one child) as 1 parity, (two to three children) multiparous and (four children and above) as grand multiparous (Janz and Becker, 2014).

#### **3.6.1.7 Antenatal Care**

This refers to the number of times mothers receive medical care (antennal and postnatal) during and after pregnancy which has the probability to affect the option for cesarean delivery.

#### **3.6.1.8 Health Policy**

This refers to women who have access to national insurance policy. The health system that deals with either cash and carry or free delivery, have influence on the option of virginal or cesarean delivery (Einarsdo-Ttir, 2012).

#### **3.6.1.9 Complication**

This refers to any physiological predisposition of the mother that affects baby delivery. A particular medical condition, attributed to Cephalic Pelvic Disproportion (CPD), Premature Rupture of Amniotic Fluid Membrane (PROM), fetal distress, breech presentation and multiple pregnancy associated with cesarean section (Panditrao, 2018).

#### **3.6.1.10 Supply and demand**

This refers to availability of professionals and infrastructure within the healthcare system affecting the option for cesarean and virginal delivery. The greater interest and accessibility to healthcare services such as surgical obstetrics, gynecologist and choice on baby delivery (Oyewole et al., 2014).

### **3.6.2 Dependent Variable**

The research dependent variable is whether the mother delivered through CS or vaginal delivery.

#### **3.6.2.1 Cesarean Section**

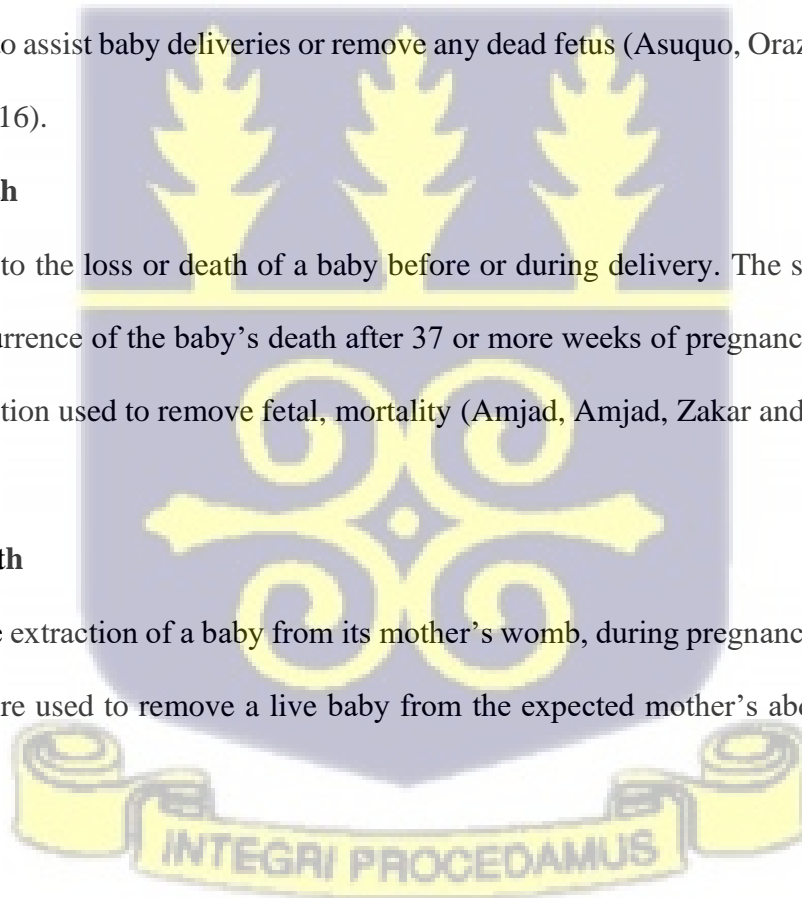
Cesarean section, refers to the medical or surgical process of cutting through the expected mother's abdomen to deliver a baby. The surgical procedure on which an incision is made on expecting mother's uterus to assist baby deliveries or remove any dead fetus (Asuquo, Orazulike, Onyekwere and Odjegba, 2016).

#### **3.6.2.2 Still Birth**

Still birth refers to the loss or death of a baby before or during delivery. The study consider still birth on the occurrence of the baby's death after 37 or more weeks of pregnancy, or any obstetric medical intervention used to remove fetal, mortality (Amjad, Amjad, Zakar and Usman, 2012).

#### **3.6.2.3 Live Birth**

This refers to the extraction of a baby from its mother's womb, during pregnancy, or any obstetric medical procedure used to remove a live baby from the expected mother's abdomen (Amjad, et al., 2012).



### **3.7 Inclusion and exclusion Criteria**

### 3.7.1 Inclusion Criteria

First, inclusion criteria ensured that women who had C-section and attended antenatal and postnatal care were included in the investigation. This was to ensure that all participants (women or mothers) who accessed the Ledzokuku Municipal Assembly (LEMA) hospital and during the period of the investigation were included in the study.

### 3.7.2 Exclusion Criteria

The exclusion criteria ensured that all mothers without medical records and who were not admitted at the facility for antenatal and postnatal complications were exempted from the study.

### 3.8 Estimate of Study Sample Size

The total number of deliveries at the Ledzokuku Municipality was 5,938 of which virginal delivery were 3,462 representing 58.3% and cesarean section 2,476 representing 41.75% in 2023. The available estimate of caesarean section delivery records at the LEKMA hospital were 41.7% of all total deliveries (Ghana Health Service, 2022).

Therefore, the Cochran (2008) formula was used to calculate the sample size on margin of error to determine the study sample size.

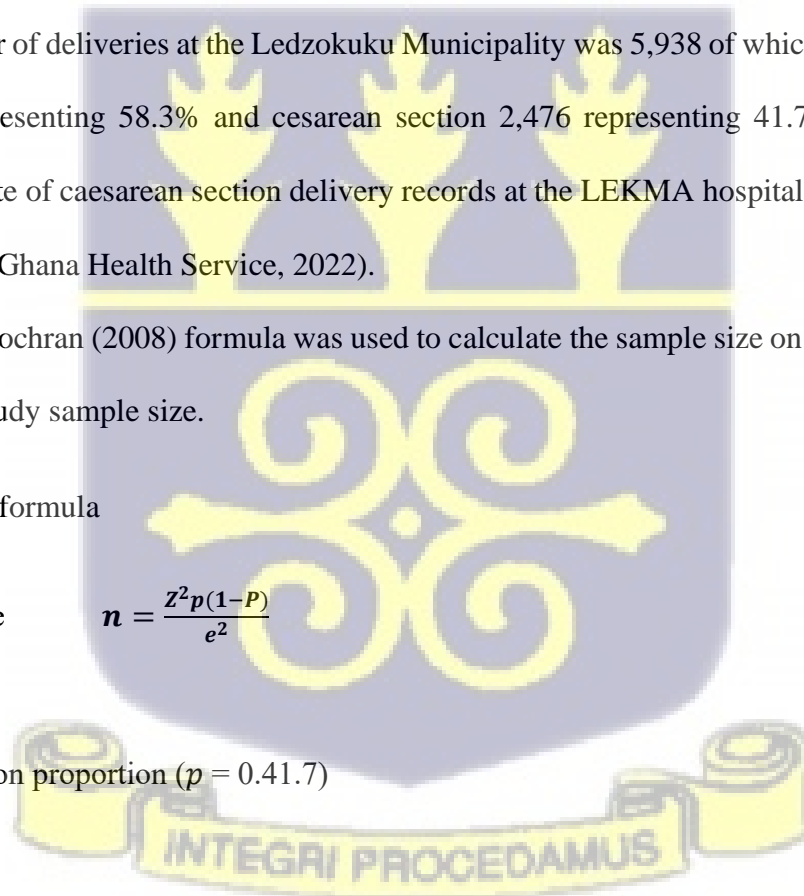
Cochran (2008) formula

$$n = \text{sample size} \quad n = \frac{z^2 p(1-p)}{e^2}$$

$p$  = the population proportion ( $p = 0.41.7$ )

$e$  = acceptable sampling error ( $e = 0.05$ )

$z$  = level of significance  $0.05 = 95\%$  (1.96)



$$n = \frac{1.96^2 \times 0.41.7(1-0.41.7)}{0.05^2} n = 373.57 = 374.$$

The total sample size was 374 for the study. The researcher added ten (10) data collection instrument as recovery rate of (non-response) to have the final sample size 374 for the study. Cochran (2008) indicated that 10% of nonresponse rate is idea to get require total sample.

### **3.9 Sampling Procedure**

The facility was purposively selected based on the fact that this was where pregnant women and mothers attended antenatal and postnatal clinic in the municipality. The researcher used the selected facility to review official records on mothers who attended antenatal and postnatal clinic at the LEKMA hospital. The availability of their records enabled the researcher to analyze the trend of cesarean section and to reach out to participants at the postnatal and antenatal clinics.

Forty-five women who attended antenatal and postnatal clinics on Mondays and Fridays which were the day for the women to access the health facility were conveniently sampled

Also, 35 staff of LEKMA hospital were also selected, five (5) of the health managers made up of gynecologist/obstetrician and administrators were purposively selected for the study. Again, the purposive sampling procedure was used to select ten (10) midwives and twenty (20) nurses from the health facility for the study.

### **3.10 Data Collection Tools**

A questionnaire and structured interview guide were used gather data for the study. The first data collection was from the official records from maternity unit, on cases of cesarean sections delivered at the LEKMA hospital, and this was accessed from the facility gynecology and obstetrics records. This data was collected to determine the preferred choice on baby delivery at the facility.

Also, the structured interview guide was used for one-on-one interview sessions with the mothers. The questionnaires were administered to women after at the antenatal clinic for mothers who were willing to participate in the study.

Again, mothers who attended postnatal clinic at the facility were interviewed to get in depth opinion and experiences on factors that influenced their choice of baby delivery at the facility. One on one interview approach was used for the participants privately to make them feel free to respond to questions.

### **3.10.2 Structured Questionnaire**

The semi-structured questionnaire was administered to staff of the health facility, health managers and nurses of the health facility. The structured questionnaires were administered to the health managers by the researcher but staff of the health facility who were busy on their daily work schedules, self-administration of the instruments was allowed. The self-administration gave respondents the opportunity to freely respond to the research questions and the chance to express their views on the research questions at their own convenience.

### **3.11 Data Processing**

The official records were reviewed to determine the demographic characteristics of the participants and number of cesarean sections at the facility. Also, the primary interview instruments were coded, sorted, edited and transcribed based on common patterns of the response provided.

### **3.12 Quality Control**

#### **3.12.1 Field Staff Training**

The study ensured that good quality control systems were observed. The researcher, because of time constraints, engaged the services of two additional persons (assistants) to support in the data collection process. The researcher trained two research assistants on how the data were to be collected and each item on the instrument was explained to them before they were allowed to collect the data.

#### **3.12.2 Data Tools Pretesting**

For the data to be collected to be accurate and reliable, the researcher pretested the data collection instrument at the Madina Polyclinic on thirty (30) respondents at the health facility to ensure that instrument was valid and reliable.

#### **3.12.3 Data Tools Revision**

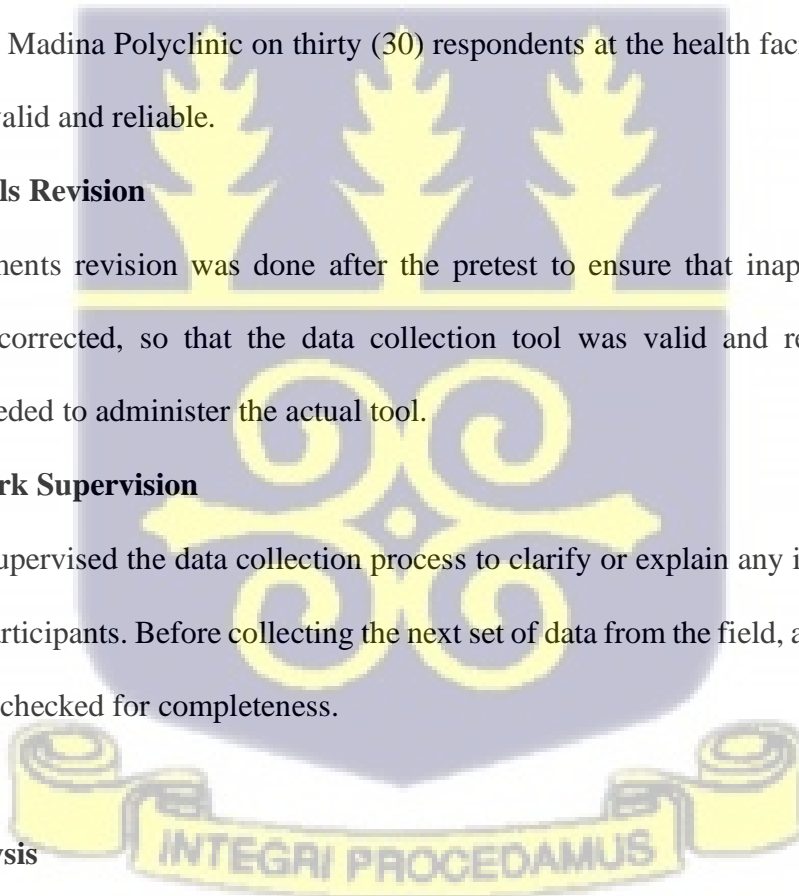
The data instruments revision was done after the pretest to ensure that inappropriate, unclear questions were corrected, so that the data collection tool was valid and reliable before the researcher proceeded to administer the actual tool.

#### **3.12.4 Field Work Supervision**

The researcher supervised the data collection process to clarify or explain any information on the instrument for participants. Before collecting the next set of data from the field, all completed tools were adequately checked for completeness.

### **3.13 Data Analysis**

The data were analyzed using descriptive and inferential statistics on the following variables, sex, age, education, marital status, occupation, religious affiliation, ethnic background, and type of



residence. To understand the socio-economic determinants on cesarean section rate in the municipality.

### **3.13.2 Study objective one: Determine the Proportion of Cesarean Section Rate (CSR) Among Mothers**

The CS rate was estimated by the number of women who chose to deliver by CS over the total number of women who delivered at the health facility.

### **3.13.3 Study Objective Two: Factors Associated/Demand for Cesarean Section Delivery among Mothers**

To address the research question, inferential statistics and thematic analysis were employed to assess the relationship or demand for cesarean section delivery among mothers at the facility, by regressing the outcome CS on the individual socioeconomic variables.. The data recoded and transformed to address the study objective and presented in tables and themes.

### **3.13.5 Study Objective Four: Health Managers Perceptions toward Cesarean Section Deliveries**

To address this research question thematic analysis were employed to explored and document health managers' perceptions towards cesarean section deliveries and women's choice of baby delivery at the facility. The data were presented in tables and themes to determine common patterns based on the study objectives.

### **3.14 Ethical Consideration**

Ethical clearance was obtained from the Ghana Health Service Ethics Review Committee before the researcher undertook the field work to obtain the relevant needed data from respondents at LEKMA Hospital (GHS-ERC 024/12/22). The responsibility of the researcher was to ensure that

any potential risk or benefits in the course of the investigation was communicated to respondents before their participation in the research. Similarly, all respondents had the right to their privacy as personal information were kept from the public domain and issues related to data storage, security and usage was protected by storing all information collected on software under password systems for one month. Description of consent process, the right to opt out of the research was observed, to allow freedom or voluntary participation of respondents. The interview lasted for thirty minutes.

Issues related to data storage, security and usage was protected by storing all information collected on software under password systems for a period until the final submission of the dissertation is presented.



## CHAPTER FOUR

### RESULTS

#### 4.0 Introduction

The chapter provides information on the study results obtained. The presentation of results pertains to the participants on the three study objectives; to determine the proportion of Cesarean Section Rate (CSR) among mothers, assess factors associated with the demand for Cesarean Section delivery among mothers and to explore health managers perceptions and attitudes toward monitoring and evaluating Cesarean Section Deliveries at LEKMA Hospital.

#### 4.1 Participants Demographic Characteristics

The section provides detailed information on demographic characteristics of participants ages, educational background, marital status, religious affiliation, occupation and the number of children for participants in this section.

**Table 4.1: Participants Demographic Characteristics**

Age	Number	Percentage (%)
18-25	39	10
26-30	130	34
31-40	79	22
41-50	70	19
51-60	56	15
Total	374	100
Education		

Non-literate	48	12
Basic	55	14
JSS/ MSLC	73	19
SSSCE/WAEC	101	27
HND/Diploma	35	10
First degree	25	7
Second degree	18	5
Other qualification	19	6
Total	374	100
<b>Marital Status</b>		
Single	32	10
Married	223	59
Separated	77	20
Divorced	42	11
Total	374	100
<b>Religious Affiliation</b>		
Traditionalist	41	11
Christian	213	56
Muslims	89	23
Others affiliation	31	10
Total	374	100
<b>Occupation</b>		
Caterer/Fish Monger/Baker	116	31
Trader/Hairdresser/Seamstress/Artisan	136	36
Entrepreneur/ Doctor/ Secretary	64	17
Civil/Public Servants	58	16
Total	374	100

Source: (Field Study, 2022)

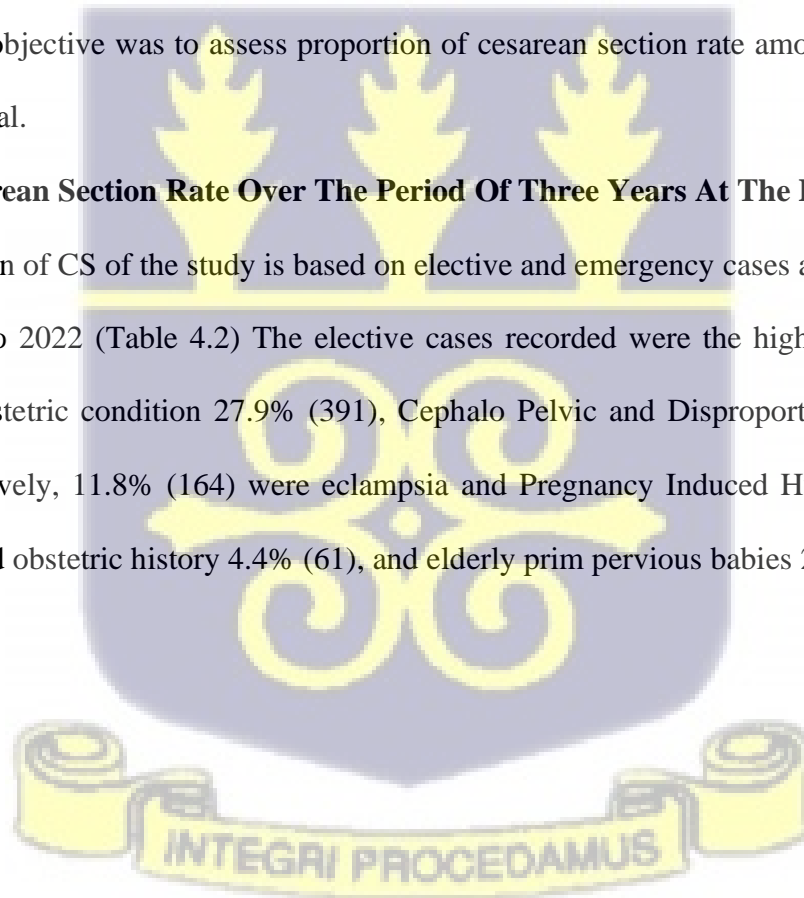
On participants age (Table 4.1) over one-third of the participants 34% (130) were between 26-30 years, 19% (70) were between 41-50 years and 15% (56) were between 15-60 years. Also, less than one-third 27% (101) and about 12 % (48) of participants had not attended formal education. On participants' marital status, 59% (223) were married, 20% (77) were separated, 11% (42) were divorced. Also, majority of the participants 56% (213) were Christians and 23% (89) were Muslims. The occupation of participants showed that 36% (136) traders, hairdressers/seamstress and artisans and 16% (58) were civil/public servants.

#### **4.2 PROPORTION OF CESAREAN SECTION RATE (CSR) AMONG MOTHERS**

The study first objective was to assess proportion of cesarean section rate among mothers at the LEKMA Hospital.

##### **4.2.1 The Cesarean Section Rate Over The Period Of Three Years At The Health Facility.**

The classification of CS of the study is based on elective and emergency cases at the facility from the year 2020 to 2022 (Table 4.2) The elective cases recorded were the highest with previous genealogical/obstetric condition 27.9% (391), Cephalo Pelvic and Disproportion (CPD) 16.4% (230). Cumulatively, 11.8% (164) were eclampsia and Pregnancy Induced Hypertension (PIH) respectively, bad obstetric history 4.4% (61), and elderly prim pervious babies 2.5% (35).



**Table 4.2: The Cesarean Section Rate for the Year 2020 at the Health Facility**

<b>2020 Cesarean Section</b>				
<b>Elective</b>	<i>Maternal conditions</i>	Cephalo Pelvic Disproportion (CPD)	62	9.4%
		Previous genealogical/ obstetric condition	278	41.9%
		Elderly prim/previous babies	30	4.5%
		Eclampsia	11	1.7%
		Bad obstetric history	22	3.3%
		Pregnancy Induced Hypertension (PIH)	60	9.1%
	<i>Indication (Foetal conditions)</i>	Abnormal presentation	71	10.7%
		Fetal abnormalities	3	0.5%
		Sub-total	537	
	<b>Emergency</b>	<i>Maternal conditions</i>	Ante Partum Hemorrhage (APH)	8
Maternal distress			11	1.7%
<i>Indication (Foetal conditions)</i>			Fetal distress	106
Sub-total		125		
<b>Total</b>		<b>662</b>		

(Source: LEMA Hospital, 2022)

Also, the Abnormal presentation were 7.3% (102) and Fetal abnormalities were 3.8% (53) (Table 4.3). On emergency cases, there were fetal distress of 18.2% (255), Ante Partum Hemorrhage (APH) recorded 4.2% (59), maternal distress 2.6% (37). For the period of 2020, the elective cases recorded at the health facility were higher than emergency cases (Table 4.3).



**Table 4.3: The Cesarean Section Rate for the Year 2021 at the Health Facility**

<b>2021 Cesarean Section</b>				
<b>Elective</b>	<b>Maternal conditions</b>		<b>%</b>	
		Cephalo Pelvic Disproportion (CPD)	194	11.1%
		Previous genealogical/ obstetric condition	443	25.2%
		Elderly prim/previous babies	86	4.9%
		Eclampsia	43	2.5%
		Bad obstetric history	74	4.2%
		Pregnancy Induced Hypertension (PIH)	454	25.9%
		<b>Indication (Fetal conditions)</b>	Abnormal presentation	99
	Fetal abnormalities	1	0.1%	
		Sub-total	1,394	
	<b>Emergency</b>	<b>Maternal conditions</b>	Ante partum hemorrhage (APH)	55
Post-Partum Hemorrhage (PPH)			8	0.5%
Maternal distress			16	0.9%
Raptured uterus previa			1	0.1%
<b>Indication (Fetal conditions)</b>			Fetal distress	281
		<b>Sub-total</b>	<b>361</b>	
		<b>Total</b>	<b>1,755</b>	

(Source: LEMA, Hospital, 2022)

For the year 2021 (Table 4.3), elective cases recorded were high with Pregnancy Induced Hypertension (PIH) being 25.9% (454) with previous genealogical/obstetric condition being 25.2% (443), abnormal presentation 5.6% (99), elderly prim/previous babies 4.9%, (86). Also, emergency cases recorded in 2021 were fetal distress 16% (281), Ante partum hemorrhage (APH) 3.1% (55), maternal distress 0.9% (16) and Post-Partum Hemorrhage (PPH) 0.5% (8) (Table 4.3).



**Table 4.4: The Cesarean Section Rate for the Year 2022 at the Health Facility**

<b>2022 Cesarean Section</b>
------------------------------

<b>Elective</b>	<b>Maternal conditions</b>		<b>%</b>	
		Cephalo Pelvic Disproportion (CPD)	230	16.4%
		Previous genealogical/ obstetric condition	391	27.9%
		Elderly prim/previous babies	35	2.5%
		Eclampsia	82	5.9%
		Bad obstetric history	61	4.4%
		Pregnancy Induced Hypertension (PIH)	82	5.9%
	<b>Indication (Fetal conditions)</b>	Abnormal presentation	102	7.3%
		Fetal abnormalities	53	3.8%
		<b>Sub-total</b>	<b>1,036</b>	
<b>Emergency</b>	<b>Maternal conditions</b>	Ante Partum Hemorrhage (APH)	59	4.2%
		Maternal distress	37	2.6%
		Raptured uterus previa	13	0.9%
	<b>Indication (Fetal conditions)</b>	Fetal distress	255	18.2%
	<b>Sub-total</b>	<b>364</b>		
		<b>Total</b>	<b>1,400</b>	

(Source: LEMA, Hospital, 2022)

#### 4.2.2 Perception of Mothers and Cesarean Section

This sought to analyze the perception of participants and factors promoting cesarean section at the health facility and various factors stated is provided below in Table 4.5.



**Table 4.5: Perception on Cesarean Section**

Valid Health Insurance	Number	Percentage (%)	
Yes	278	73	
No	98	27	
Total	374	100	
<b>Benefits of Insurance</b>			
Covered surgery	48	22	
Covered Drugs	55	26	
Covered Hospital Stay	73	52	
Total	374	100	
<b>Perception on CS</b>			
Positive perception	103	28	
Negative perception	271	72	
Total	374	100	
<b>Children Born through CS</b>			
Elective	Maternal condition	55	51
	Fetal condition	39	35
Emergency	Maternal condition	10	9
	Fetal condition	3	4
Total		107	100
<b>Income Levels and CS</b>			
100-500	176	198	
600-1,000	91	283	
1,100 and above	107	267	

**Source: (Field Study, 2022)**

#### **4.2.2.1 National Insurance and the Choice of Baby Delivery mode**

Participants were asked to indicate whether they had valid national insurance and how insurance influenced their choice of cesarean or vaginal baby delivery (Table 4.5).

The results show that about 73% (276) of mothers had valid health insurance and 52% (198) of mothers indicated that the availability of valid insurance covered general hospital stay at the health facility.

From the qualitative interview some participants maintained that one would have to bear the full cost of cesarean section delivery if one did not have health insurance, hence, their preference for vaginal delivery at the facility.

- i. *“I use to have national insurance cover but after it expired I was not able to renew my card and when I got pregnant I was told my baby was overweight but there was nothing I could do about it. Since my husband lost his job I had to manage to deliver my baby vaginally”.*
- ii. *“I know that having national insurance can benefit a mother to get free healthcare but I do not have it currently and I have to do all I could because staying at the hospital will attract more cost”.*
- iii. *I had to pay for the full cost of the cesarean section after I went through the method. Initially, my plan was to deliver vaginally but after the process delayed for over three hours. I was asked to prepare for cesarean section and that is how come I went through the method”.*

#### **4.2.2.2 Women’s Perception towards Cesarean Section Delivery**

Table 4.5 above show that about 72% (271) of mothers had negative perception toward cesarean section and they preferred vaginal delivery. In the in-depth interviews some mothers expressed these negative notions in this manner.

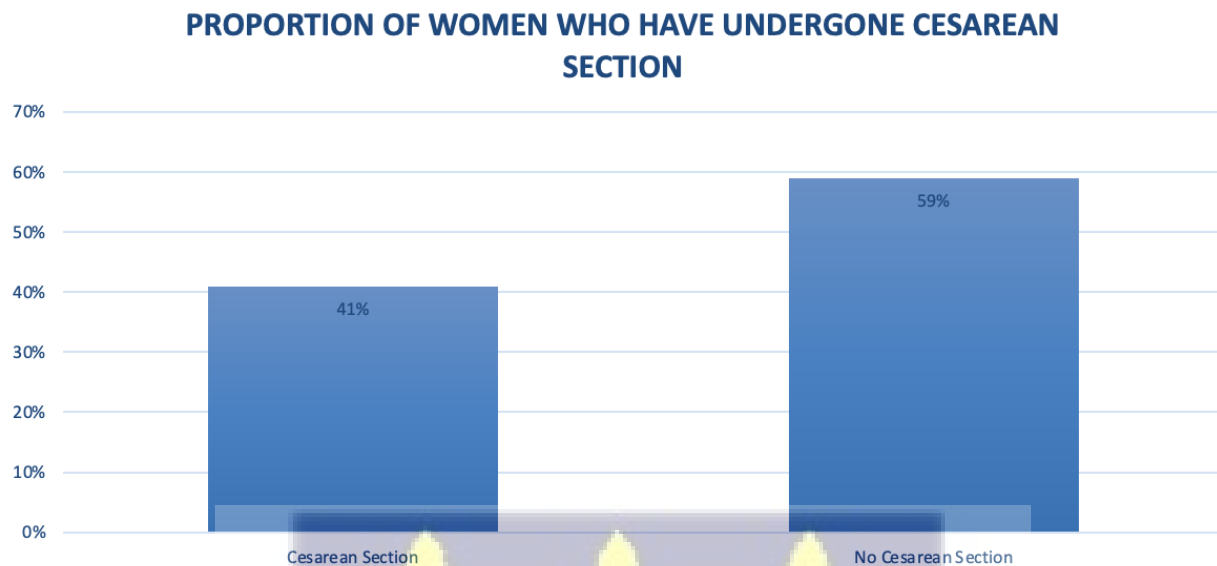
- i. *“I have nothing to do with cesarean deliveries based on my belief that God had endowed me with the ability to go through normal vaginal delivery as a women”.*
- ii. *“I have the hope that being a women nothing can stop me from delivering all my babies that I carry whenever I get pregnant. Vagina help me to contact my baby very early”.*
- iii. *I have seen many women who go through cesarean section who come back home with many complication like the doctors leaving blade or objects in their abdomen of which they have to come back to the hospital for second surgery”.*
- iv. *“I know that because doctors or professionals are available this is the reason most women are trying to have cesarean section. To extent that in my village where there are only Traditional Birth Attendants (TBA) available majority of pregnant women go through normal (vaginal) delivery”.*
- v. *“I fear for my life to go for cesarean section because I may loss my life and my child too”.*

The mothers with negative perception towards Cesarean section (CS), maintained that as women, they were capable of having their babies through vaginal delivery. Furthermore, these mothers stated they preferred vaginal delivery because the method provided mothers the opportunity to recover from childbirth early and other participants observed that the method allowed mothers early contact with their babies. Some observed that that they feared for the death of an expected mother or losing their babies through CS.

#### **4.2.2.3 Proportion of Babies Delivered Through Cesarean Section(s)**

The study sought to analyze the proportion of babies delivered through cesarean section(s) and in Figure 4.1, 41% of mothers out of the total deliveries had undergone cesarean section.

**Figure 4.1 Proportion of Cesarean Section**



**Source: (Field Study, 2022)**

The in-depth interview with mothers provided results on the reasons why mothers opted for the Cesarean section as:

- i. *“I went for cesarean section after I went for computerized thermography and was told that I had overweight baby”.*
- ii. *“I was told that due to my previous medical record and my age the only option was for me to go through the method since my condition could make it possible or help me deliver vaginally”.*
- iii. *My obstetrician was very good. After she examined me and told me looking at my condition I should prepare for the cesarean section and that was how come I used the methods for my two babies for the second time”.*
- iv. *“The cesarean section provided me with the opportunity to avoid prolong labour delay”.*

Majority of mothers who chose the cesarean delivery method indicated that they had to undergo cesarean section due to a medical condition and explained that because they were informed that they had overweight babies and were told not to deliver vaginally, they had to undergo through C-section at the facility.

#### **4.3 Factors Associated with the Demand for Cesarean Section Delivery among Mothers**

The analysis in the regression model (Table 4.6) was reliable since the R square >50% ( $R^2$  59% > 50%) at 0.05 significant level. This suggests that all predictor (independent) variables are sufficiently able to predict the dependent variable.

The study examined mothers' views on factors that were associated with cesarean section baby delivery. The study revealed that majority 50% (190) of mothers observed that cesarean section or method allowed mothers to have easy deliveries (Table 4.6).

The study sought to examine factors that promoted cesarean section delivery and the study showed that most mothers observed that a medical condition 35% (133) was the main driver for cesarean section (Table 4.6).

The regression model also shows that income levels of mothers contributed to the rise in cesarean section at the facility. In Table 4.6, mothers with income levels of Ghs1,100.00 and above were more likely to opt for cesarean section baby delivery. Similarly, Mothers who had tertiary education were more likely to prefer cesarean section baby delivery. Health managers reported that the availability of specialist (Gynecologist or Obstetricians) had contributed to the rise of cesarean section.

Most of the health managers also reported that they allowed mothers to opt for cesarean section when they realized that babies were at risk upon examination of mothers.

**Table 4.6: Factors Associated with the Demand for Cesarean Section**

<i>Regression Statistics</i>	
Multiple R	0.77
R Square	0.59
Adjusted R Square	0.47
Standard Error	38.45
Observations	18.00

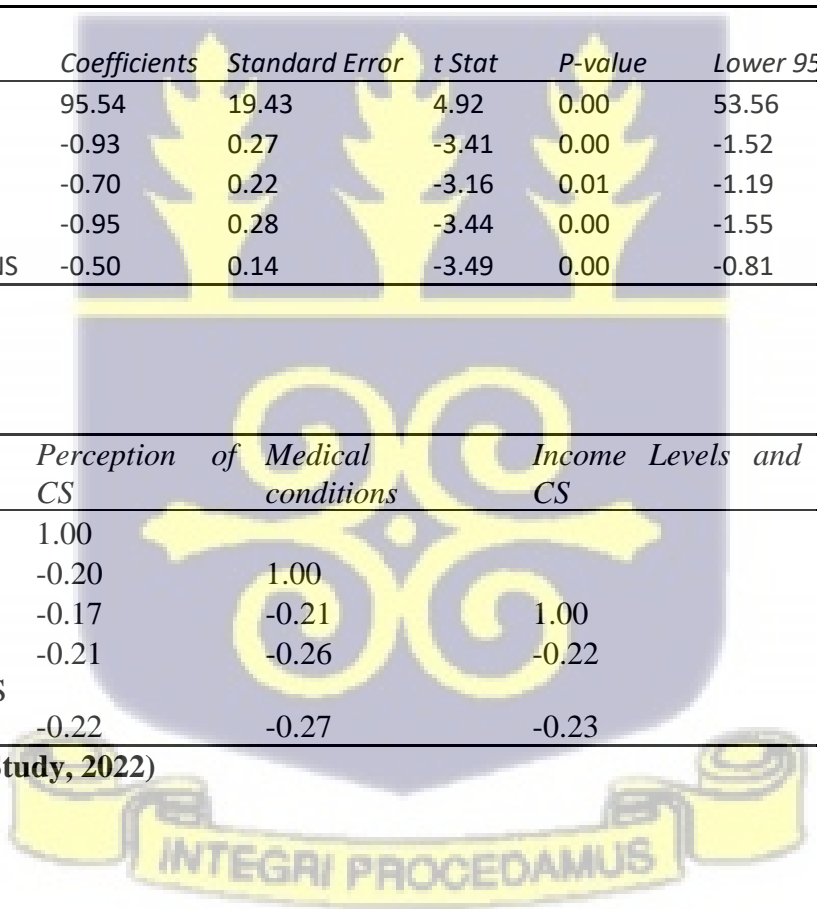
ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	4.00	27962.22	6990.55	4.73	0.01
Residual	13.00	19216.89	1478.22		
Total	17.00	47179.11			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	95.54	19.43	4.92	0.00	53.56	137.52	53.56	137.52
Medical conditions	-0.93	0.27	-3.41	0.00	-1.52	-0.34	-1.52	-0.34
Income Levels	-0.70	0.22	-3.16	0.01	-1.19	-0.22	-1.19	-0.22
Education	-0.95	0.28	-3.44	0.00	-1.55	-0.35	-1.55	-0.35
HEALTH MANAGERS PERCEPTIONS	-0.50	0.14	-3.49	0.00	-0.81	-0.19	-0.81	-0.19

	<i>Perception of CS</i>	<i>Medical conditions</i>	<i>Income Levels and CS</i>	<i>Education and CS</i>	<i>HEALTH MANAGERS PERCEPTIONS</i>
Perception of CS	1.00				
Medical conditions	-0.20	1.00			
Income Levels and CS	-0.17	-0.21	1.00		
Education and CS	-0.21	-0.26	-0.22	1.00	
HEALTH MANAGERS PERCEPTIONS	-0.22	-0.27	-0.23	-0.27	1.00

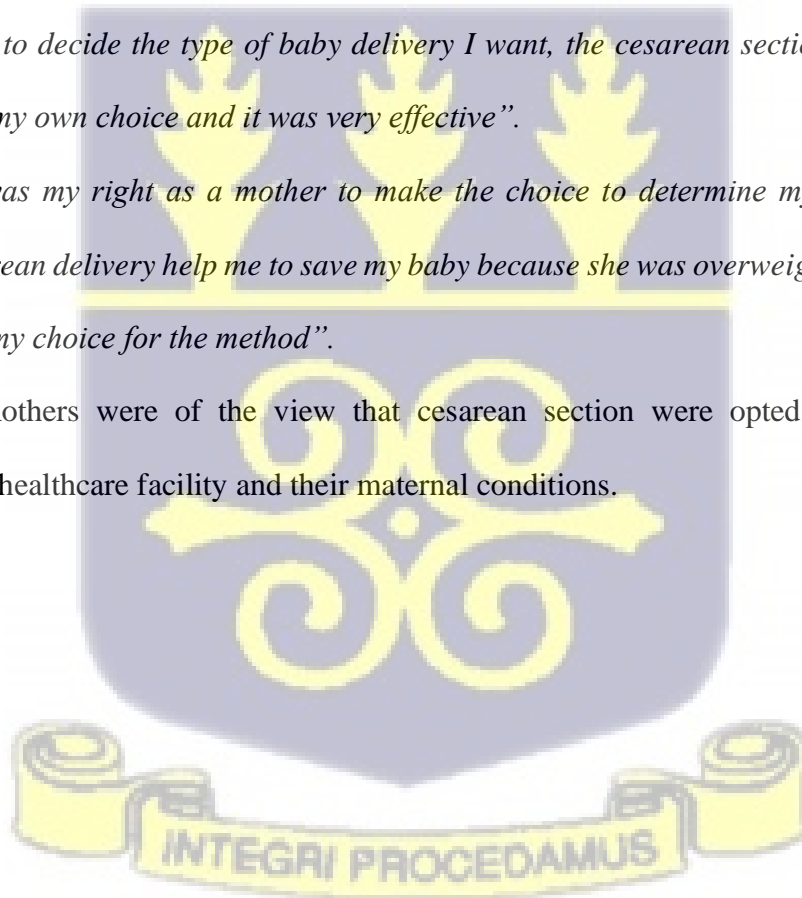
Source: (Field Study, 2022)



An in-depth interview session understand the reasons for their preference for the cesarean section at the facility is expressed below

- i. *“I think that the availability of healthcare managers have largely contributed to the rise in cesarean section. Upon being told by my doctor that I had pregnancy induced hypertension related complication this made to have cesarean section at the facility”.*
- ii. *“I was told that virginal delivery was painful by my sister who have two children and when I got pregnant I made up my mind to opt for vaginal delivery and it was very successful”.*
- iii. *“The improvement in the healthcare has reduced infections at the facility. I have my right to decide the type of baby delivery I want, the cesarean section I went through was my own choice and it was very effective”.*
- iv. *“It was my right as a mother to make the choice to determine my preference. The cesarean delivery help me to save my baby because she was overweight before delivery and my choice for the method”.*

Many of the mothers were of the view that cesarean section were opted by them due to improvement in healthcare facility and their maternal conditions.



## CHAPTER FIVE

### DISCUSSION OF FINDINGS

#### 5.1 Introduction

The chapter presents information related to discussion of findings of the study. The areas discussed are based on the specific study objectives.

#### 5.2. Age and women choice for Cesarean Section

This study finds that older mothers and younger mothers between the ages of 17 and 41 years tend to deliver by cesarean section. Similarly, a study conducted by Becher and Stokke (2013) in Tanzania at the St. Joseph hospital found that 212 were C-sections, among mothers between the ages of 16 to 45 years. Similarly, a study conducted in Japanese hospitals found that there was significant correlation with advance age of mothers and caesarean (Suzuki, 2014). Raisanen, Gissler, Kramer and Heinonen (2014) study in India found that C-section option were associated with economic status and vaginal deliveries were higher in poor households compared to rich homes.

#### 5.3 Conditions for Demand for Cesarean Section Delivery

According to Yassin, Saida and Yassin (2012) in a cross-sectional study in Egypt revealed that women who had less than two births were more likely to experience C-sections than women with more parity. Another study in Algeria revealed that extreme parity was associated with mode of C-section delivery because women who had C-sections were likely to have multiparous and primiparous as possible risk factor to opt for C-section (Tebeu et al., 2016).

This study finds that over the period of three years, elective cases were comparatively higher than emergency cases of CS recorded at the facility with previous genealogical/obstetric conditions, maternal and fetal distress being predominate factors. However, ruptured uterus previa and fetal abnormalities were least causes of CS over the period. Francome and Savage (2013), noted that studies have demonstrated that factors such as parity, maternal weight, birth weight and history of antenatal visit are associated with C-section. Similarly, the Ghana Health Service (GHS, 2018), observed that for instance, healthcare provision or services during pregnancy and childbirth are necessary for the well-being and survival for both the infant and the mother. The results correlate with Panditrao (2018) study in Africa which found that Cephalic Pelvic Disproportion (CPD) and Premature Rupture of Amniotic Fluid Membrane (PROM) were conditions faced by pregnant women and made obstetricians to advise expected mothers to opt for C-sections.

This study also confirms with Loke et al., (2015) study in Turkey that many cesarean sections were influenced by complication which required them to undergo through cesarean section.

The study found that proportion of babies delivered through cesarean section(s) were about 61% (55) elective with maternal conditions), 35% (39) due to (Fetal condition). This confirms with Becher and Stokke (2013) study conducted in Tanzania, at the St. Joseph hospital found that (212) births were through C-sections.

Further, this study reveals that 73% of mothers had valid health insurance. The benefits of insurance cover, for 52% of mothers show that the availability of valid insurance covered general hospital stay at the health facility. Mothers stated that this insurance cover where it covers 26% of expected mothers drugs provided mothers with the leverage of cutting down the cost surgery at

the facility. The healthcare policy regulation like health insurance has been seen to have contributed to the increasing choice for C-section by pregnant women in the health facility.

This finding confirms with the Ghana Health Service (2018) assertion that in Ghana, the High Impact Rapid Delivery (HIRD) for Safe Motherhood Initiative and the Emergency Obstetric and Neonatal Care (EmONC) which provides mothers and their babies with effective maternal healthcare insurance policy has led to overall reduction in infant and children under five mortality.

#### **5.4 Factors Associated with the Demand for Cesarean Section Delivery among Mothers**

Over a third of mothers observed that medical condition is the main driver for cesarean section and 30% of C-section were associated with overweight babies. A study, which examined the history of baby delivery in Malaysia, found that 52.9% of women had experienced previous C-sections or repeated C-section (Rezaie, Torkashvand and Karami, 2014).

Expected mothers past cesarean section delivery is seen as a main factor for the rise in cesarean section. Studies carried out in rural areas in Nepal, within a period of one year indicated that there were about 91% were C-sections with nulliparous and 38.5% multiparas (Jonanne et al., 2016). Studies in Africa attributed to Cephalic Pelvic Disproportion (CPD), Premature Rupture of Amniotic Fluid Membrane (PROM), fetal distress, breech presentation and multiple pregnancy are common factors associated with increased cesarean rates (Panditrao, 2018).

The study further reveals that 29% of mothers with high income opt for cesarean section baby delivery. The study results show that for an expected mother to accept cesarean section, her income is likely to be a motivator for a person's preference. The wealth index of households has been found to influence options for C-section delivery (Arsenault, Fournier, Philibert, Sissoko and Coulibaly, 2013). In the African sub-region, poor women within households were not likely to opt for C-section delivery (Gartoulla, Liabsuetrakul, Chongsvivatwong and McNeil, 2012).

Further, other factors inducing C-section at the facility is better educational levels of mothers. Mothers with tertiary education preferred cesarean section baby delivery. Kottwitz (2014) study in Tunisia suggested that access to proper healthcare facilities was the driving force behind discrepancies in mode of deliveries and noted that irrespective of one's educational background access to obstetric services is key to determine C-sections rate.

Educated mothers prefer C-section due to the information they have heard about painful vaginal delivery. These findings are supported by Hou et al., (2014) study conducted in China which established that economic levels made mothers to access better healthcare facilities in this country to cause the rise of C-sections for which higher education were linked to better economic levels. Belizan, Althaba, Barros, Alexander and Beliz, (2016) collaborated with this and noted that in advance countries with middle-income levels medical delivery have had tremendous impact on C-section delivery.

### **5.5. How Health Managers Perceptions toward Cesarean Section Deliveries**

This objective examines health manager's perceptions and attitudes toward monitoring and evaluating cesarean section deliveries. The study results show that 53% (199) of the health managers reported that the availability of the specialist (Gynecologist or Obstetricians) have contributed to the rise of cesarean section (CS) and 47% (175). Hou, et al., (2014) argued that supply and demand factors influence women behavior towards CS due to availability of professional in the healthcare sector and attributed the mode or choice of child delivery on women's beliefs to be generally, doctors' advice as the rising causes of C-section. A study in Cameroon study revealed that out of 125 women who had undergone C-section, mothers ages between 39 and above were at higher risk to have normal delivery. The behavior economics model

explains that women make decision on cesarean based on availability of healthcare interventions (Hou, Sabah and Iunes, 2014).

The behavior of women is shaped by availability of information regarding interventions such as health insurance, professional doctors or modern medication based on impact these can have on their behavior (Hou, et al., 2014).

Many health managers observe that the availability of the specialist (Gynecologist or Obstetricians) improvement in the healthcare facility influence the rise in cesarean section to provide mothers their babies' safer delivery Similarly, the findings confirm the theory of behavioral economics model which states that when supply meets demand because of availability professional in the healthcare sector, this influences the rising cause of C-section (Hou, et al., 2014).

Over fifty percent of health managers indicate that they would allow mothers to opt for cesarean section when they realize that babies are at risk upon examination of mothers and 45% of health managers would ask mothers undergo through cesarean section due to the safety of the baby and mother. The finding confirms with Panditrao (2018), who observed that issues related to complications were the leading factors of cesarean section with Cephalic Pelvic Disproportion (CPD), Premature Rupture of Amniotic Fluid Membrane (PROM), fetal distress, breech presentation were intervening variable with increased cesarean rates. Yassin, Saida and Yassin (2012) study in Egypt, found that women with low parity were more likely to experience C-sections than women with more parity (Janz and Becker, 2014). Studies have shown that women who opted for C-section delivery, perceived childbearing associated with age, women above 49 years were likely to experience C- section (Janz and Becker, 2014).

### **5.6 Limitation of the Study**

The study reviewed available official records at the facility and conducted in-depth interview with mothers to explore their views on factors promoting cesarean section. The use of secondary data gives missing information needed thus being a limitation to the use of this data.



## CHAPTER SIX

### CONCLUSION AND RECOMMENDATION

#### 6.1 Introduction

The chapter provides information related to summary, conclusion and recommendation of the study. The summary provides detailed overview of the objectives which guided the study, the various methods employed.

#### 6.2 Conclusion

The proportion of babies delivered through cesarean section(s) is 61% in this study being elective with maternal conditions and 35% due to (Fetal condition).

Key determinants for the rise in cesarean section are medical condition of mothers, women perception towards faster baby delivery mode and mothers' high educational levels. Finally, improvement and availability of gynecologist or obstetricians in the healthcare facility are associated with Cesarean sections.

#### 6.4 Recommendation

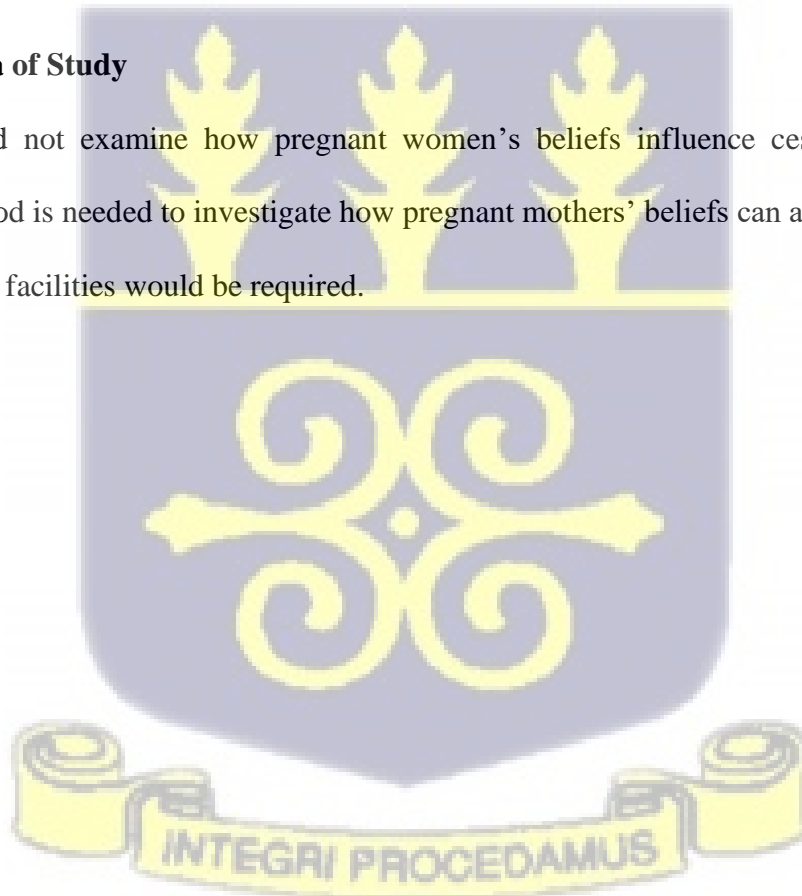
The study recommends for the health managers at the Ledzokuku-Krowor Municipality (LEKMA) to act on these.

1. The Ledzokuku-Krowor Municipality (LEKMA). Hospital should educate pregnant women on the risk and benefits of vaginal and cesarean section deliveries at the facility by the health authorities. Specifically, midwives and obstetricians should educate women at the antenatal and postnatal clinics. This is relevant to provide firsthand information for women on their medical conditions regarding cesarean section to help manage babies' deliveries at the facility in the Ledzokuku-Krowor Municipality (LEKMA).

2. The LEKMA Hospital's nutritional department should educate expected women to eat health foods at the antenatal clinic. Since better economic and educational levels has been found to be associated with the rise in cesarean section. This may help mothers to eat healthy foods necessary to reduce maternal complications among pregnant mothers in the study area.
3. The study recommends that health managers at the LEKMA facility should continue to monitor and evaluate pregnant women for these women to have information on their medical condition beforehand. This should empower women with knowledge on medical conditions to make better decision when to manage CS cases at the facility.

### **6.5 Future Area of Study**

The study could not examine how pregnant women's beliefs influence cesarean section. A qualitative method is needed to investigate how pregnant mothers' beliefs can affect the choice of CS in healthcare facilities would be required.



## Reference

Adamba, C. (2013). *Socioeconomic Inequalities and Maternal Health Outcomes in Ghana*. University Of Ghana, Legon.

Adeline, A. B., Anne, S., Ana, P. B., Aluisio, J. D. B., Ties, B., Maria, R. T., & Cesar, G. V. (2018). Within Country inequalities in cesarean section rates: observational study of 72 low- and middle-income Countries. *British Medical Journal*, 360(55).

Agency for Healthcare Research and Quality (2011). *HCUP Facts and figures: statistics on hospital-based care in the United States*. Available at (last accessed in April, 2022).

Agency for Healthcare Research and Quality (2013). *HCUPNet, healthcare cost & utilization project. complications of pregnancy, childbirth, and the puerperium*. Available at (last accessed in April, 2022).

Akintayo, A. A., Ade-Ojo, I. P., Olagbuji, B. N., Akin-Akintayo, O. O., Ogundare, O. R., & Olofinbiyi, B. A. (2014). Cesarean section on maternal request: The viewpoint of expectant women. *Archives of Gynecology and Obstetrics*, 289(4), 781–785.

Allen, V.M., O'Connell, C.M., Baskett T.F. (2013). Maternal morbidity associated with cesarean delivery without labour compared with spontaneous onset of labor at term. *Obstetric Gynecology*. 102:477–82.

American College of Obstetricians and Gynecologists (2014). Society for Maternal-Fetal Medicine, Caughey AB, Cahill AG, Guise JM, Rouse DJ. *Safe prevention of the primary cesarean delivery. Am J Obstet Gynecol. 2014; 210(3):179–93.*

American College of Obstetricians and Gynecologists (ACOG) (2017). *Cesarean delivery: resource overview.* [Blog Post]. Available through: <https://www.acog.org/Womens-Health/Cesarean-Delivery>.

Amjad A, Amjad U, Zakar R, Usman A, Zakar MZ, Fischer F. (2012). *Factors associated with caesarean deliveries among child-bearing women in secondary analysis of data from the demographic and health survey, Pakistan.*

Anon. (2018). Cesarean Delivery Rate. Available at: <https://www-doh.state.nj.us/doh-shad/view/sharedstatic/CesareanDeliveryRate.pdf>. *Appropriate technology for birth. Lancet;2:436–7.*

Arsenault, C., Fournier, P., Philibert, A., Sissoko, K., Coulibaly, A., Tourigny, C., & Dumont, A. (2013). Emergency obstetric care in Mali: catastrophic spending and its impoverishing effects on households. *Bull World Health Organ, 91(3), 207–216.*

Asuquo EO, Orazulike NC, Onyekwere EC, Odjegba JN, Ojo AI, Ogbansiegbe JA (2016). *Factors associated with preference for caesarean section among women in the ante-natal clinic of a tertiary hospital in the Niger Delta, Nigeria.*

Ayano, M., Geremew, A., Beyene, W., & Muleta, A. G. (2015). Prevalence and Outcome of Caesarean Section in Attat Hospital, Gurage Zone, SNNPR, Ethiopia. *Archives Of Medicine*, 7(1), 1–5.

Baumgartner, T., Strong, C. & Hensley, L (2005). *Conducting and reading research in health and human performance*. McGraw-Hill Higher Education.

Becher, L., & Stokke, S. (2013). *Indications For Cesarean Section In St . Joseph Medical Hospital*  
Linn Becher and Siril Stokke Supervisors.

Belizán, J. M., Althabe, F., Barros, F. C., Alexander, S., Beliz, J. M., Barros, C., & Alexander, S. (2016). Rates and Implications of Caesarean Sections in Latin America : Ecological Study Rates and implications of caesarean America : *ecological study sections in Latin*, 319(7222), 1397–1400.

Betran AP, Torloni MR, Zhang JJ, Gülmezoglu AM (2015). *WHO Working Group on Caesarean Section. WHO statement on caesarean section rates: a commentary*. BJOG. <https://doi.org/10.1111/1471-0528.13526>.

Betrán, A. P., Ye, J., Moller, A.-B., Zhang, J., Gülmezoglu, A. M., & Torloni, M. R. (2016). *The Increasing Trend in Caesarean Section Rates: Global, Regional and National Estimates: Uganda Demographic Health Survey*.

Buyukbayrak, E. E., Kaymaz, O., Kars, B., Karsidag, A. Y. K., Bektas, E., Unal, O., & Turan, C. (2010). Caesarean delivery or vaginal birth: preference of Turkish pregnant women and

influencing factors. *Journal of Obstetrics and Gynaecology : The Journal of the Institute of Obstetrics and Gynaecology*, 30(2), 155–158.

Callaghan, W. M. (2012). Severe Maternal Morbidity Among Delivery and Postpartum Hospitalizations in the United States. *Obstetrics & Gynecology*, 1.

Cyr, R. M. (2006). Myth of the ideal cesarean section rate: Commentary and historic perspective. *American Journal of Obstetrics and Gynecology*, 194(4), 932–936.

Danso KA, Schwandt HM, Turpin CA, Seffah JD, Samba A, Hindin MJ. (2009). Preference of Ghanaian women for vaginal or caesarean delivery postpartum. *Ghana Med J*;43(1):29.

Dursun, P., Yanik, F. B., Zeyneloglu, H. B., Baser, E., Kuscu, E., & Ayhan, A. (2011). Why women request cesarean section without medical indication? *The Journal of Maternal-Fetal & Neonatal Medicine : The Official Journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstetricians*, 24(9), 1133–1137.

Einarsdóttir, K., Kemp, A., Haggard, F. A., Moorin, R. E., Gunnell, A. S., Preen, D. B., ... Holman, J. (2012). Increase in Caesarean Deliveries after the Australian Private Health Insurance Incentive Policy Reforms. *PLoS ONE*, 7(7).

Etringer AP, Pinto MFT, Gomes M. (2019). Análise de custos da atenção hospitalar ao parto vaginal e à cesariana eletiva para gestantes de risco habitual no Sistema Único de Saúde. *Cien Saude Colet*;24(4).

Frankel, J. R., & Wallen, N. E. (2008). *How to Design and Evaluate Research in Education (4th ed.)*. Boston: McGraw Hill.

Francome C, Savage W. (2013). Caesarean section in Britain and the United States is either the right rate? *Social Science Medicine*. 37:1199–218.

Gartoulla, P., Liabsuetrakul, T., Chongsuvivatwong, V., & McNeil, E. (2012). Ability to pay and impoverishment among women who give birth at a University Hospital in Kathmandu, Nepal. *Global Public Health*, 7(10), 1145–1156.

Gebremedhin, S. (2014). Trend and socio-demographic differentials of Caesarean section rate in Addis Ababa, Ethiopia: analysis based on Ethiopia demographic and health surveys data. *Reproductive Health*, 11(1), 14.

Gibbons L, Belizán JM, Lauer JA, Betrán AP, Merialdi M, Althabe F. (2010). *The global numbers and costs of additionally needed and unnecessary caesarean sections performed per year: overuse as a barrier to universal coverage*. World Health Report, Background Paper 30. Geneva, World Health Organization.

Grove, D. (2018). *What is population in qualitative method*. A&C: AC Black.

Ghana Statistical Service (2020). *Ledzokuku-Krowor Population and housing census, 2020*. GSS, Accra.

Ghana Statistical Service (2010). *Ledzokuku-Krowor Population and housing census, 2020*. GSS, Accra.

Global Date (2015). *Forthcoming report about preterm births*. GD.

Gjonej, R., Poloska, A., Keta, M., Delija, Z., Zyberaj, F., & Bezhani, V. (2015). The reasons of rising trend of cesarean section rate year after year. *A retrospective study*, 79–15.

Gunnervik, C., Sydsjö, G., Sydsjö, A., Selling, K. E., & Josefsson, A. (2008). Attitudes towards cesarean section in a nationwide sample of obstetricians and gynecologists. *Acta Obstetrica et Gynecologica Scandinavica*, 87/438–444.

Harrison MS, Goldenberg RL (2016). Cesarean section in sub-Saharan Africa. *Matern Health Neonatol Perinatol*. 2;2(1):6.

Healthcare Payment Learning and Action Network (2020). *Accelerating and aligning clinical episode payment models*. McLean: The MITRE Corporation.

Hou, X., Sabah Rakhshani, N., & Iunes, R. (2014). Factors associated with high Cesarean deliveries in China and Brazil - A Call for reducing elective surgeries in moving towards universal health coverage. *Journal of Hospital Administration*, 3(5), 67–78.

Janz, N. K., & Becker, M. H. (2014). The Health Belief Model: A Decade Later. *Health Education Quarterly*, 11(1), 1–47.

Johanne, L., Kristina, S., Steinsvik, R., & Pun, P. (2016). Indications for Cesarean Sections in Rural Nepal. *The Journal of Obstetrics and Gynecology of India*, 66(1), 284–288.

Kahsay S, Berhe G, Gebremari A. (2015). Determinants of caesarean deliveries and its major indications in Adigrat hospital, Northern Ethiopia: *a case-control study*. *Epidemiology*; 5:3–5.

Keeney R. (2008). Personal decisions are the leading cause of death. *Oper Res.* ;56(6):1335-1347.

Kottwitz, A. (2014). Mode of birth and social inequalities in health: the effect of maternal education and access to hospital care on cesarean delivery. *Health & Place*, 27, 9–21.

Kumekpor, T. K. B. (2009). *Research Methods and Techniques of Social Research*. Accra: SonLife.

Loke, A. Y., Davies, L., & Li, S. (2015). Factors influencing the decision that women make on their mode of delivery: *the Health Belief Model*. *BMC Health Services Research*, 15, 274.

Lauer J, Betrán A. (2017). Decision aids for women with a previous caesarean section: *Focusing on women's preferences improves decision making*. *BMJ*. 334:1281–2.

Long, Q., Kempas, T., Madede, T., Klemetti, R., & Hemminki, E. (2015). Caesarean section rates in Mozambique. *BMC Pregnancy and Childbirth*, 15, 253.

Lumbiganon, P., Laopaiboon, M., Glmezoglu, A. M., Souza, J. P., Taneepanichskul, S., Ruyan, P., & Villar, J. (2010). *Method of delivery and pregnancy outcomes in Asia: the WHO global survey on maternal and perinatal health*.

Lurie, S. (2015). The changing motives of cesarean section: from the ancient world to the twenty-first century. *Archives of Gynecology and Obstetrics*, 271(4), 281–285.

- Manyeh AK, Amu A, Akpakli DE, Williams J, Gyapong M. (2018). Socioeconomic and demographic factors associated with caesarean section delivery in Southern Ghana: evidence from INDEPTH network member site. *BMC Pregnancy Childbirth.*;18(1):405.
- Médici A., & Ribeiro A. (2020). *Observatório ANHAP - Associação Nacional dos Hospitais Privados*;
- Mekonen Y (2012). *Maternal health in Ethiopia: challenges in achieving the MDG for maternal mortality*: in-depth analysis of the EDHS Addis Ababa: UNFPA.
- Munro, S., Lewin, S., Swart, T., Volmink, J., Redding, C., Rossi, J., & Evans, O. (2007). A review of health behavior theories: how useful are these for developing interventions to promote long-term medication adherence for TB and HIV/AIDS?. *BMC Public Health*, 7(1), 104.
- Meessen, B., Hercot, D., Noirhomme, M., Ridde, V., Tibouti, A., Tashobya, C. K., & Gilson, L. (2011). Removing user fees in the health sector: a review of policy processes in six subSaharan African countries. *Health Policy & Planning*, 26(suppl\_2), 16–29.
- Neuman M, Alcock G, Azad K, et al (2014). *Prevalence and determinants of caesarean section in private and public health facilities in underserved South Asian communities*: cross-sectional analysis of data from Bangladesh, India and Nepal. *BMJ Open*.
- Neuman, W. L. (2007). *Basics of Social Research: Qualitative and Quantitative Approaches* (2nd ed.). *Boston: Pearson Education, Inc.* pp.54, 161.

Oonagh, E. K., Norman, J. E., & Stock, S. J. (2018). Long- term risks and benefits associated with cesarean delivery for mother, baby, and subsequent pregnancies: systematic review and meta-analysis. *PLOS*, *15* (1). <https://doi.org/10.1371/journal.pmed.1002494>.

Ostovar R, Rashidian A, Pourreza A, Rashidi BH, Hantooshzadeh S, Ardebili HE, Mahmoudi M. (2010). Developing criteria for cesarean section using the RAND appropriateness method. *BMC pregnancy and childbirth*;10(1):1–8.

Osuala, V. (2011). *Qualitative and quantitative approached to modern research*. Chicago: University of Chicago.

Orji, R., Vassileva, J., & Mandryk, R. (2012). *Towards an Effective Health Interventions Design: An Extension of the Health Belief Model*. Online Journal of Public Health Informatics. <https://doi.org/10.5210/ojphi.v4i3.4321>.

Oyewole, W. R., Umar, A., Yayok, R. P., Shinaba, S. T., Atafo, C. I., & Olusanya, M. O. (2014). *An Evaluation of the Factors That Influences Caesarean Section in F . C . T Hospitals, Nigeria*.

Pallasmaa, N. (2014). *Cesarean Section - Short Term Maternal Complications*.

Panditrao S. (2018). Intra-operative difficulties in repeat cesarean sections. *Obstetrics Gynecology India*;58 (6):507–10.

Prah J, Kudom A, Afrifa A, Abdulai M, Siriky I, Abu E. (2017). Caesarean section in a primary health facility in Ghana: clinical indications and feto-maternal outcomes. *J Public Health Afr*. 2017;8(2):704., Kudom A, Afrifa A, Abdulai M, Siriky I, Abu E. Caesarean

section in a primary health facility in Ghana: clinical indications and fetomaternal outcomes. *J Public Health Afr.*;8(2):704.

Räisänen, S., Gissler, M., Kramer, M. R., Heinonen, S., Gibbons, L., Belizán, J., & Braveman, P. (2014). Influence of delivery characteristics and socioeconomic status on giving birth by caesarean section – a cross sectional study during 2000–2010 in Finland. *BMC Pregnancy and Childbirth*, 14(1), 120.

Rahman, A. E., Ahmed, S., & Khan, M. M. (2018). Determinants of caesarean section in Bangladesh: cross-sectional analysis of Bangladesh demographic and health survey 2014 data. *Plos One*, 13(9).

Reason for high caesarean section rate (2013). *Child connection*; Available: [www.childbirthconnection.org/ceasareanbooklet](http://www.childbirthconnection.org/ceasareanbooklet).

Rezaie, B., Torkashvand, S., Karami, F., & M, S. F. (2014). A survey on causes of cesarean sections performed at the university hospitals of, Iran. *In the second trimester of 3*(2).

Rice T. (2013). *The behavioral economics of health and health care*. Department of Health Policy and Management, Fielding School of Public Health, University of California, Los Angeles, California.

Robson, S. J., & De Costa, C. M. (2017). *Thirty years of World Health Organization's target on caesarean section rate: Time to move on [pdf]*. *NCBI*, 206 (4). Available through: <https://www.ncbi.nlm.nih.gov/pubmed/28253469>

- Silveira D. (2019). Available at <https://g1.globo.com/economia/noticia/2019/12/20/gasto-de-brasileiros-com-saude-privada-em-relacao-ao-pib-e-maisque-dobro-da-media-dos-paises-da-ocde-diz-ibge.ghtml>;
- Smith, V. (2012). A qualitative analysis: using the Health Belief Model to explain Dengue fever in two communities in Trinidad and Tobago. *Journal of the Department of Behavioral Sciences*, 2(1), 90–101.
- Stanton C, Castro A, Adanu R, Heymann M, Adu-Bonsaffoh K, Lattof SR, Blanc A, Langer A. (2013). Measuring coverage in MNCH: validating women’s self-report of emergency cesarean sections in Ghana and the Dominican Republic. *PLoS One*.;8(5):e60761.
- Suzuki, S., & Nakata, M. (2013). Factors associated with the recent increasing cesarean delivery rate at a Japanese perinatal center. *ISRN Obstetrics and Gynecology*, 1–4
- Tashakkori, A., & Teddie, C. (2013). *Handbook of Mixed Methods in Social Behavioral Research*. Thousand oaks CA: Sage Publications, Inc, p. 14, 16.
- Tebeu, P. M., Mboudou, E., Halle, G., Kongnyuy, E., Nkwabong, E., & Fomulu, J. N. (2016). Risk Factors of Delivery by Caesarean Section in Cameroon (2003-2004): A Regional Hospital Report. *ISRN Obstetrics and Gynecology*, 1–5.
- Truven Health Analytics (2020). The cost of having a baby in the United States.
- Vogt, S. E., Silva K.S., & Dias M. (2014). Comparison of childbirth care models in public hospitals, Brazil. *Rev Saude Publica*. 48 (2):304–13.
- World Health Organization (2019). *Monitoring emergency obstetric care: a handbook*. WHO
- World Health Organization [WHO]. (2015). *WHO statement on caesarean section rates* [pdf]. Available at: [http://apps.who.int/iris/bitstream/handle/10665/161442/WHO\\_RHR\\_15.02\\_eng.pdf?sequence=1](http://apps.who.int/iris/bitstream/handle/10665/161442/WHO_RHR_15.02_eng.pdf?sequence=1)

World Health Organization (2016). *Provision of effective antenatal care: integrated management of pregnancy and childbirth*. Geneva: World Health Organization.

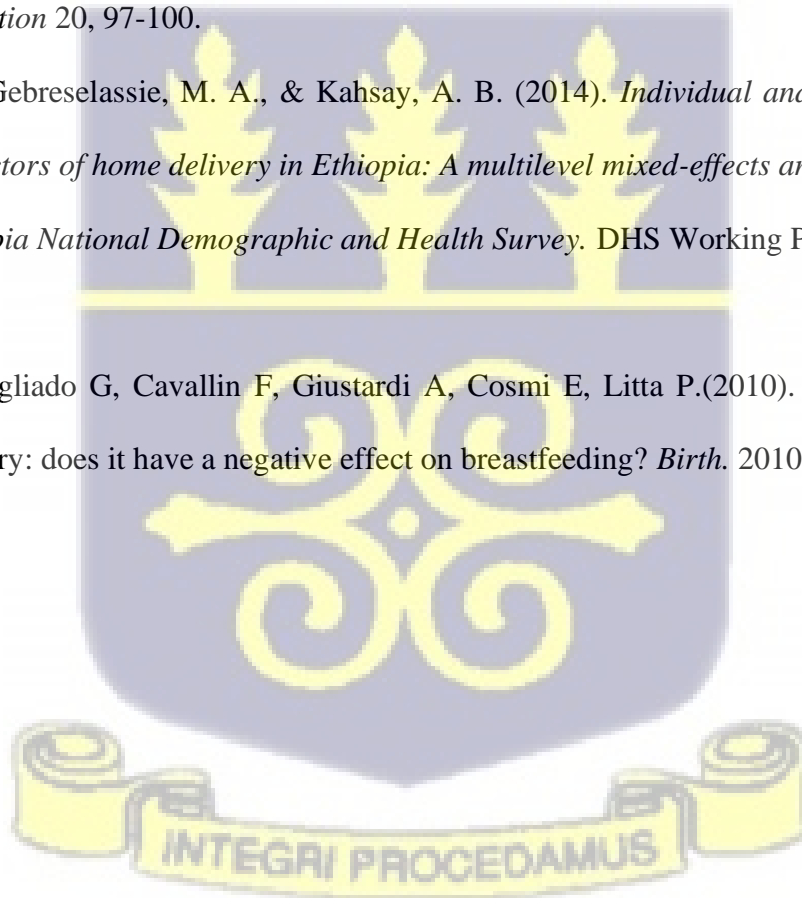
Xu K, Soucat A, & Kutzin J. (2018). *Public spending on health: a closer look at global trends*: World Health Organization (WHO).

Yassin, K., Saida, G., & Yassin, C. K. (2012). Levels and Determinants of Caesarean Deliveries in Egypt: Pathways to Rationalization. *The Internet Journal of World Health and Societal Politics*, 7(2).

Yamane, D. (2018) Formula of margin of error on social science condition. *Journal Science Condition* 20, 97-100.

Yebo, H. G., Gebreselassie, M. A., & Kahsay, A. B. (2014). *Individual and community-level predictors of home delivery in Ethiopia: A multilevel mixed-effects analysis of the 2011 Ethiopia National Demographic and Health Survey*. DHS Working Papers No. 104.

Zanardo V, Svegliado G, Cavallin F, Giustardi A, Cosmi E, Litta P.(2010). Elective cesarean delivery: does it have a negative effect on breastfeeding? *Birth*. 2010;37(4):275–9.



## APPENDIX I: PARTICIPANT INFORMATION SHEET

**Title: Determinants of Demand For Cesarean Section Delivery At The Ledzokuku-Krowor**

**Municipal Assembly (Lekma) Hospital**

**Principal Investigator: Nana Pimaa Akrofi-Addo**

**Address: Department of HPPM, School of Public Health, University of Ghana.**

**Email: nanapimaaa@gmail.com**

**Tel: 0263204626**

### **Background and Purpose of Research**

The research delves into the determinants of cesarean section rate at the Ledzokuku-Krowor Municipal Assembly (Lekma) Hospital. The study is expected to unearth factors influencing the rising rate of cesarean section among women at the facility.

### **Nature of Research**

This is a mixed method study, that will involve 374 respondents in the Ledzokuku-Krowor Municipal Assembly (Lekma). The facility-based procedure of sampling will be used to review official records on mothers who attend antenatal and postnatal clinic at the LEKMA hospital. The availability of their records will enable the researcher to contact the women who could easily be reached at the postnatal and antenatal clinic. The questionnaire contains questions which will determine the determinants for the demand of cesarean section. The results from these will be analyzed, synthesized and interpreted to show the determinants and the reason for the high rate.

### **Possible Risks and Discomforts**

There is a minimal risk study. There is no physical and limited or no psychological risks because the response to the questions are not overly sensitive or traumatic. The time it takes for respondents to answer the questionnaire might be inconvenient.

### **Possible Benefits**

There will be no direct benefits to respondents for participating in this research but the knowledge gained from this study may benefit society in general.

### **Confidentiality**

We will protect information about you to the best of our ability. Your name would not be provided on the questionnaires. Interview instrument sheet will be sent directly into a data base which cannot be accessed by a third party other than my supervisor who may access my records.

### **Compensation**

There are no compensation packages whether in cash or kind available for participation

### **Voluntary Participation and Right to Leave the Research**

This study is strictly voluntary. Should you, at any point during the study, decide that you do not wish to participate any further, you are free to terminate your participation immediately.

### **Termination of Participation by the Researcher**

No circumstance may cause your termination from this study

### **Outcome and Feedback**

Data obtained at the end of this research will be used to develop measures that will help reduce the Caesarean section rate in Ghana.

### **Funding Information**

The study would be self-funded by the World Health Organization.

### **Sharing of Participants' Information/Data**

Participant information would not be shared with a third party with the exception of my Supervisor who would have access to my records.

### **Data Access and Storage**

Data will be collected using context analysis and structured interview guide for the study.

### **Provision of Information and Consent for Participants**

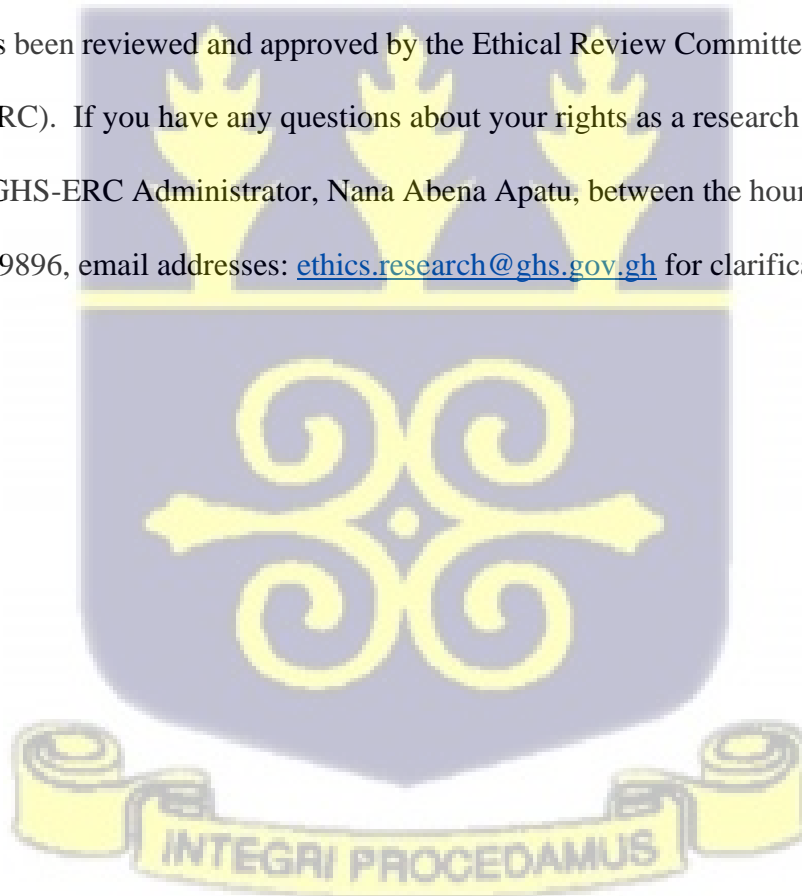
A copy of the Information sheet and Consent form will be given to you after it has been signed or thumb-printed to keep

### **Contacts for Additional Information**

You may contact me, Principal Investigator (Nana Pimaa Akrofi-Addo, 0263204626), or my supervisor ( Patricia Akweongo PhD) on 0243138376 if you need further explanation of pertinent questions about this research.

### **Your rights as a Participant**

This research has been reviewed and approved by the Ethical Review Committee of Ghana Health Service (GHS-ERC). If you have any questions about your rights as a research participant you can contact the GHS-ERC Administrator, Nana Abena Apatu, between the hours of 8 am-5 pm through, 0503539896, email addresses: [ethics.research@ghs.gov.gh](mailto:ethics.research@ghs.gov.gh) for clarification.



**APPENDIX II: CONSENT FROM FOR STUDY RESPONDENTS**

**STUDY TITLE: Determinants of Demand for Cesarean Section Delivery At The Ledzokuku-Krowor Municipal Assembly (Lekma) Hospital**

**PARTICIPANTS' STATEMENT**

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

I voluntarily agree to be part of this research.

Name of Participant.....

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

Date:.....

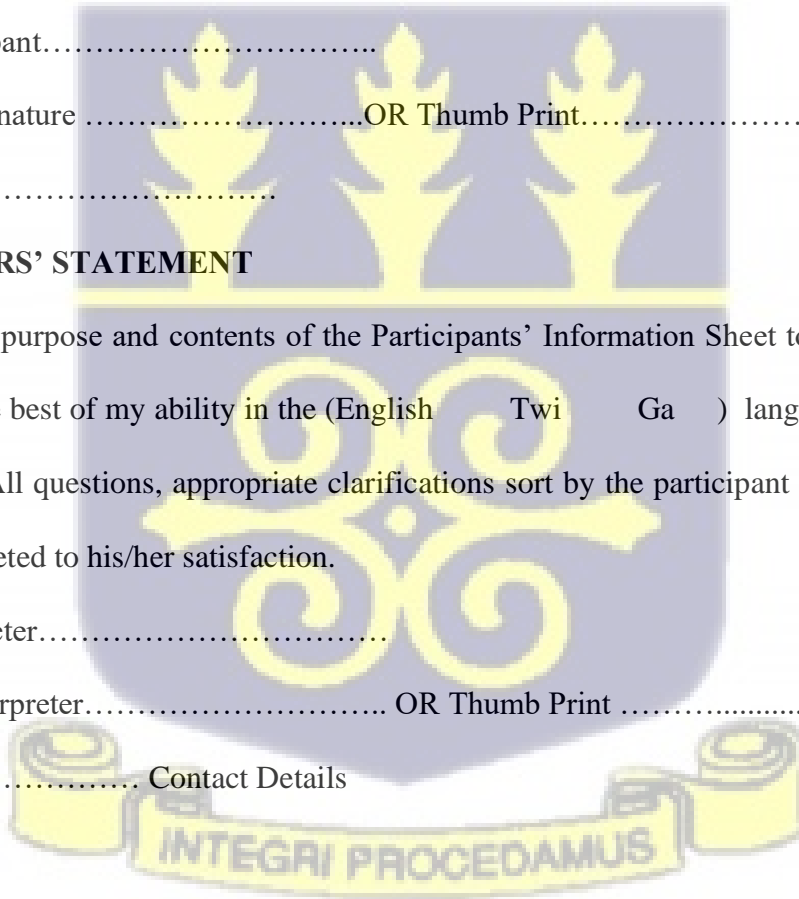
**INTERPRETERS' STATEMENT**

I interpreted the purpose and contents of the Participants' Information Sheet to the afore named participant to the best of my ability in the (English Twi Ga ) language to his proper understanding. All questions, appropriate clarifications sort by the participant and answers were also duly interpreted to his/her satisfaction.

Name of Interpreter.....

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

Date:..... Contact Details



**STATEMENT OF WITNESS**

I was present when the purpose and contents of the Participant Information Sheet was read and explained satisfactorily to the participant in the language, he/she understood (English, Twi, Ga)

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

Name:.....

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

Date:.....

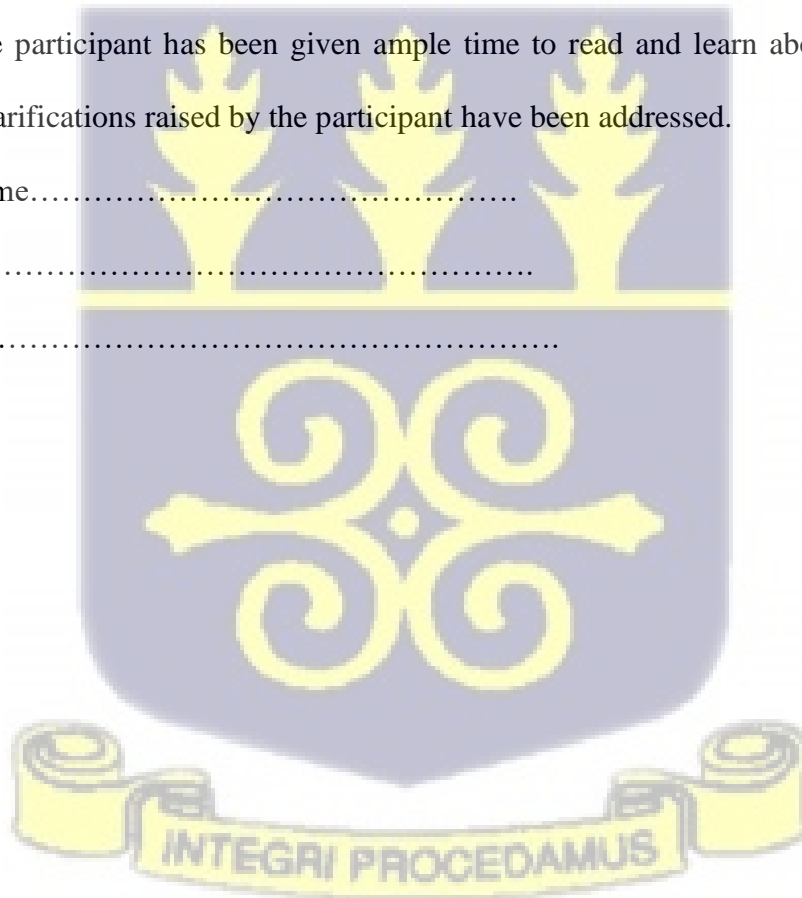
**INVESTIGATOR STATEMENT AND SIGNATURE**

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

Researcher's name.....

Signature .....

Date.....



**APPENDIX III: DATA COLLECTION TOOL**

**STRUCTURED INTERVIEW GUIDE**

The research is for academic purpose and being conducted by a final year student of the University of Ghana, Legon- School of Public Health.

On the topic: **DETERMINANTS OF DEMAND FOR CESAREAN SECTION DELIVERY AT THE LEDZOKUKU-KROWOR MUNICIPAL ASSEMBLY (LEKMA) HOSPITAL.**

Your participation is much needed to help the research to be successful. A participant may withdraw as and when he/her feels to discontinue from the study. Any information provided by participants will be treated with confidentiality.

The interview will be held privately for participant to feel free to provide information that will aid answer the study objectives.

**SECTION A (Bio Data of Respondent)**

1. What is your age?

- a. 18-25 ( ) b. 26-30 ( ) c. 31-30 ( ) d. 41-50 ( ) e. 51-60 ( )

2. Educational background?

- a. Non-literate ( ) b. Basic ( ) c. JSS. MSLC ( ) d. SSSCE/WAEC ( ) e. HND/Diploma f. first degree ( ) g. second degree ( ) h. and other qualification specify ( )

3. Marital status?

- a. Single ( ) b. Married ( ) c. Separated ( ) d. Divorced ( )

4. Religious affiliation?

- a. Traditionalist ( ) b. Christian ( ) c. Moslem ( ) others specify.....

5. Indicate your occupation

.....

6. How many children do you have?

.....

**SECTION B: PROPORTION OF CESAREAN SECTION RATE (CSR) AMONG MOTHERS**

7. Do you have a valid national health insurance and did it influence your choice of baby delivery?

.....  
.....

8. Can you explain to me your perception towards cesarean section delivery?

.....  
.....

9. If you have undergone cesarean section what was your experienced?

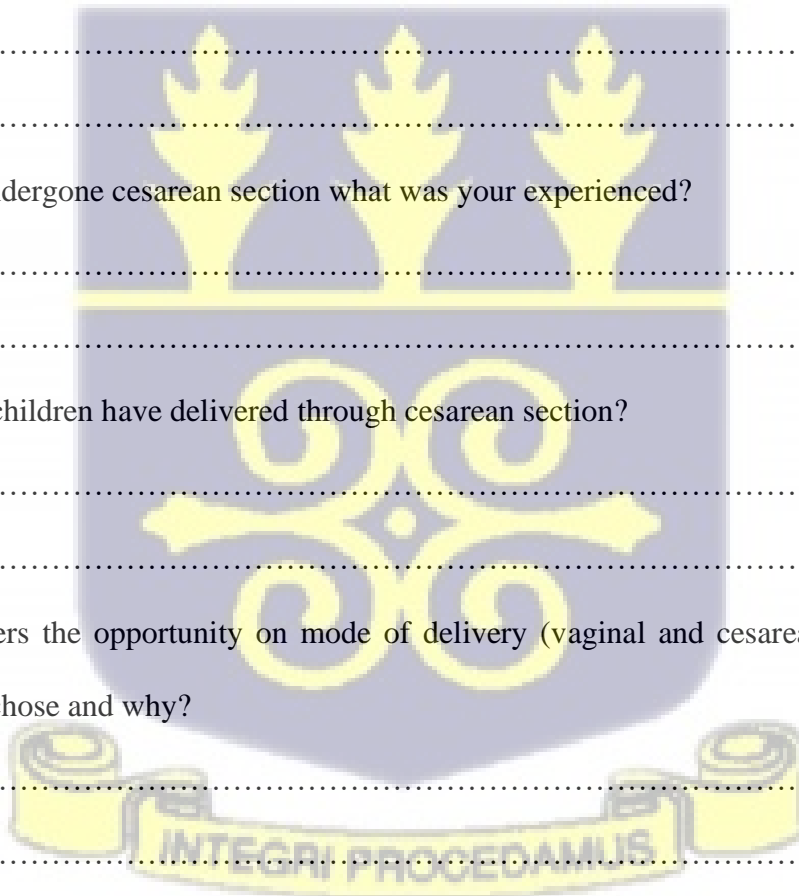
.....  
.....

10. How many children have delivered through cesarean section?

.....  
.....

11. Given mothers the opportunity on mode of delivery (vaginal and cesarean section) which option will you chose and why?

.....  
.....



**SECTION C: FACTORS ASSOCIATED WITH THE DEMAND FOR CESAREAN SECTION DELIVERY AMONG MOTHERS**

12. Do you think any of these factors are associated with cesarean section baby delivery?

- a. This allows early contact with new born baby ( )
- b. Increase hospital stay ( )
- c. This allows faster recovery ( )

13. Which of these factors promotes cesarean section delivery?

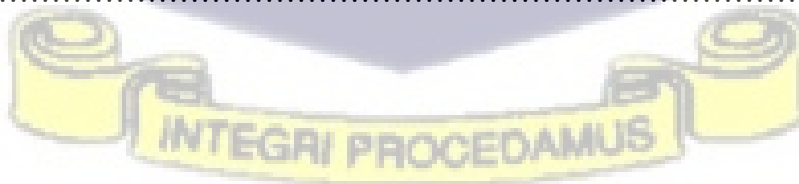
- a. Past cesarean section delivery ( )
- b. Not having any baby after 45 years ( )
- c. Overweight baby ( )
- d. Medical condition ( )

14. Does the mother's income contribute to the rise in cesarean section at this facility? Why?

.....  
.....

15. Does the educational level of expected mothers have a cause in the rise of cesarean section delivery at this facility? Why?

.....  
.....



16. Can you explain how the support of expected mother husband (s) promote the rise in cesarean section at this facility.

.....  
.....

**SECTION D: HEALTH MANAGERS PERCEPTIONS AND ATTITUDES TOWARD MONITORING AND EVALUATING CESAREAN SECTION DELIVERIES**

17. Can you explain how the availability of gynecologist and obstetricians have anything to do with the increasing caesarean section in this facility?

.....  
.....

18. Has the improvement in the healthcare facilities have any factor to the demand for cesarean section at this facility and why?

.....  
.....

19. Do you think that the pain of vaginal delivery on mothers influences medical professionals to advise expected mothers to opt for cesarean section delivery in this facility and why?

.....  
.....

20. Can you explain if the wellbeing of the baby is/are promoting cesarean section in this facility and why?

.....  
.....

21. Can you explain to me if the cost of cesarean section has affected the rate of cesarean section at this facility and why?

.....  
.....

Thank you



**APPENDIX IV: ETHICAL APPROVAL**

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



**GHANA HEALTH SERVICE ETHICS REVIEW COMMITTEE**  
 Research & Development Division  
 Ghana Health Service  
 P. O. Box MB 190  
 Accra  
 Digital Address: GA-050-3303  
 Mob: +233-50-3539896  
 Tel: +233-302-681109  
 Email: [ethics\\_research@ghs.gov.gh](mailto:ethics_research@ghs.gov.gh)  
 6<sup>th</sup> February, 2023

My Ref. GHS/RDD/ERC/Admin/App / 23/087  
 Your Ref. No.

Nana Pimaa Akrofi-Addo  
 P.O. Box M 597  
 Accra

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

GHS-ERC Number	GHS-ERC: 024/12/22
Study Title	Determinants of Demand for Cesarean Section Delivery at the Ledzokuku-Krowor Municipal Assembly (LEKMA) Hospital
Approval Date	6 <sup>th</sup> February, 2023
Expiry Date	5 <sup>th</sup> February, 2024
GHS-ERC Decision	Approved

**This approval requires the following from the Principal Investigator**

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

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

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

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

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

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

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

