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Factors and Nursing Implications Associated with unplanned Cesarean Births in South Governmental Hospitals of Gaza Strip: A Case-Control Study

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Factors and Nursing Implications Associated with unplanned Cesarean Births in South Governmental Hospitals of Gaza Strip: A Case-Control Study

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Thesis Approval

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Dedication

First and foremost, I appreciate Allah for providing me the strength when I was weak. The first human teacher, Prophet Mohammad, peace be upon him.

For my father Ibrahim, the great teacher who always guides and supports me.

I love you, my mother Maryam, who is the shinning side in my life....

My parents, I adore you from the bottom of my heart.

My wonderful husband, Dr. Samer, who always supports me and lifts my hand when I fall and provides me spiritual warmth when I fall, thank you for your help.

My beautiful and bright children who are the brighten side my life, thank you very much Basil, Rany, Yousef, and Kinda, and dearest Julia... I love you deeply.

Thank you so much, my dear brothers and sisters.

For everyone who has an impact on my life.

Lujain Ibrahim Ahmad Abu Mustafa

Declaration

I certify that this thesis submitted for the degree of Master is the result of my own research, except where otherwise acknowledged, and this study (or any part of the same) has not been submitted for a higher degree to any other university or institution.

Signed:

Lujain Ibrahim Ahmad Abu Mustafa

18/12/2022

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Finally, I shall never forget my wonderful, free country: Palestine

Abstract

Background: Unplanned caesarean birth remains a public health issue in various regions despite decades of research and prevention efforts. Aim: The study aimed to determine associated factors and nursing implications for unplanned caesarean birth. Material and Methods: This study used a matched case-control design, with a 1 case:1 control ratio. The research was done at Al-Tahrer and Al- Emaraty maternity hospitals. A total of 400 women participated in the study (200 cases vs 200 controls). A panel of specialists devised and tested a structured interviewing questionnaire to collect data from the sample. Ethical considerations were taken into account while collecting the data. Results: Women with unplanned caesarean birth are in the age ranges of less than 20 years, 20-24 years, 25-30 years, and more than 30 years, with percentages of 11%, 26%, 33%, and 30%, respectively. The following socio-demographic predictors were found to be statistically associated with an increased risk of unplanned caesarean birth: young mother age of fewer than 20 years old (mOR: 4.17), maternal level of education of fewer than 9 years (mOR: 2.87), separated women (mOR: 5.21), unemployed husbands (mOR: 1.7), unemployed women (mOR: 1.6), family members between 4 and 6 (mOR: 1.87) and family members more than 6 (mOR: 2.01), and low monthly income of less than 1974 NIS (mOR: 2.57). The results related to maternal and neonatal somatic characteristics showed that maternal obesity with a body mass index of more than 30 (mOR: 2.28), a stature of mother less than 150 cm (mOR: 3.82), weight gain of more than 16 kg during the pregnancy (mOR: 2.6), anemia (mOR: 1.62), gestational age of fewer than 37 weeks (mOR: 8.66) and more 42 weeks and (mOR: 4.60) were statistically associated with increased risk of unplanned caesarean birth. Furthermore, the previous obstetrical history showed that oligohydramnios (mOR: 8.29), preeclampsia (mOR: 3.03), bad CTG fold (mOR: 20.38), breech position (mOR: 3.03), obstructed labor (mOR: 6.32), multiple pregnancy (mOR: 5.21), primigravida (mOR: 2.21), primi para (mOR: 2.04) short duration between births of less than 2 years (mOR: 5.29) and previous unplanned caesarean birth (mOR: 6.03) are associated with unplanned CS. The factors related to the previous antenatal care includes starting ANC visits during the first trimester (mOR: 0.62), breech presentation during the last month fold (mOR: 11.61), and not discussing the pregnancy issues with the husband (mOR: 1.57) were associated with unplanned CS. The factors related to the sporting regimen during the last pregnancy includes not doing deep breathing exercises (mOR: 4.21), not doing physio balls exercises (mOR: 11.83), not walking during pregancy (mOR: 4.27), not doing the back massage during the last pregnancy (mOR: 16.74), not doing deep breathing exercises during delivery (mOR: 2.05), back massage during delivery (mOR: 3.605), and not walking during delivery (mOR: 1.627) were factors related to unplanned CS. The factors related to psychological and social stressors during pregnancy include mild (mOR: 12.538), moderate (mOR: 12.918), and severe levels of psychological pressures (mOR: 8.138), domestic violence (mOR: 5.71), and facing a difficult birth process (mOR: 2.25) were related to unplanned CS. Finally, the factors related to the nursing implications includes not having been instructed by sports regimens during pregnancy (mOR: 1.84), the number of ANC visits 1 to 3 times (mOR: 0.56), and 4 to 8 visits (mOR: 0.42), not receiving an explanation of the birth process to reduce their fear factor (mOR: 1.67), not having instructed of deep breathing (mOR: 2.76), not instructed of walking (mOR: 1.6), and not instructed of back massage (mOR: 2.79) are factors related to unplanned CS. Conclusion and Recommendations: The study concluded that maternal exposure to some several pre-mentioned demographic characteristics, maternal anthropometric status, previous obstetric history, ANC, sporting regimen, and psychological and social stressors during pregnancy were independently associated with unplanned caesarean birth. The majority of these factors are modifiable exposures that with maternal adherence to healthy behavior and appropriate nursing implications could lead to a reduction of unplanned CS.

List of abbreviations

ANC	Antenatal Care
aOR	Adjusted Odds Ratio
APFT	Army Physical Fitness Test
APH	Antepartum Hemorrhage
BI	Birth Interval
BMI	Body Mass Index
CI	Confidence Interval
CTG	Cardiotocography
EUPATI	European Patients' Academy on Therapeutic Innovation
GDM	Gestational Diabetes Mellitus
GWG	Gestational Weight Gain
Hb	Hemoglobin
HIV	Immunodeficiency Virus
IDA	Iron Deficiency Anemia
IPI	Interpregnancy Interval
IUD	Intra-Uterine Device
MICS	Multiple Indicator Cluster Surveys
MoH	Ministry of Health
mOR	Matched Odds Ratio
NGOs	Nongovernmental Organizations
NICU	Neonatal Intensive Care Unit
NVD	Normal Vaginal Delivery
PHC	Primary Health Care
PTSD	Posttraumatic Stress Disorder
RDS	Respiratory Distress Syndrome
TGCS	Ten Group Classification System
UNRWA	United Nation Relief and Work Agency for Palestine Refugees in the Near East
VBAC	Vaginal birth after Cesarean Section
WHO	World Health Organization

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Chapter One

Introduction

1.1 Background

Despite decades of research and prevention efforts, cesarean birth remains a regional indicator of public health. Caesarean births have become the most common major surgical procedure in several countries. Contrary to the recommendations of the World Health Organization (WHO), the prevalence of unplanned caesarean birth is rising worldwide, with the greatest increase in Latin America (Magne et al., 2017). Unplanned caesarean birth can be a life-saving measure when medically approved, but it can have short- and long-term negative effects on the health of women and children. Given the rising rate of unplanned caesareans, especially in the absence of a medical justification, it is essential to gain a deeper understanding of their effects on women's and children's health. After an unplanned caesarean birth, maternal mortality and morbidity are higher than after vaginal birth (Sandall et al., 2018).

The rates of unplanned caesarean births between countries, ranging from 0.6% in South Sudan to 55.5% in Brazil (Rudey et al., 2020). Because of the increased risk and cost of unplanned caesarean births, several health systems are looking for safe ways to reduce caesarean rates. For optimal outcomes for mother and child, WHO recommended a maximum of 10-15% unplanned caesarean birth and issued a statement summarizing the findings of comprehensive reviews and analyses of current data on unplanned caesarean birth. A clinically indicated unplanned caesarean birth is influenced by numerous variables, some of which are modifiable and others of which are not (WHO, 2015).

During the year 2021, the number of caesarean births in the governmental hospitals is 20,704 deliveries accounting for 28.4% of all deliveries. In the Gaza Strip, there was 9,219 caesarean births in the governmental hospitals accounting for 25.4% of the total deliveries. In contrast, there was 11,485 caesarean births in the governmental hospitals in the West Bank accounting for 31.4% of the total deliveries (MoH, 2022).

Cesarean birth dose-dependently increases the risk of uterine rupture, aberrant placentation, ectopic pregnancy, stillbirth, and premature birth. Emerging evidence suggests that babies born via unplanned caesarean birth are exposed to various hormonal, physical, bacterial, and medical exposures and that these exposures can subtly alter neonatal physiology and increase

the risk of short-term unplanned caesarean birth, such as through altered immune development, an increased likelihood of allergy, atopy, and asthma, and a reduction in intestinal gut microbiome diversity (Sandall et al., 2018).

Children born by unplanned caesareans had an increased risk of asthma until age 12 and obesity until age 5. Caesarean birth is associated with an increased risk of miscarriage and stillbirth in subsequent pregnancies. It is associated with an increased risk of placenta previa, placenta accreta, and placental abruption in subsequent pregnancies (Keag et al., 2018). Women who had an unplanned caesarean delivery exhibited higher levels of posttraumatic stress disorder (PTSD) symptoms associated with childbirth compared to those who had a vaginal delivery (Dekel et al., 2019). After an unplanned caesarean birth, the likelihood of endorsing clinically significant psychiatric symptoms increased by a factor of two, while the likelihood of childbirth-related PTSD increased by a factor of three (Dekel et al., 2019). Consequently, the purpose of this study is to investigate the risk factors associated with unplanned caesarean birth and identify the nursing implications that contribute to reducing these risk factors in the Gaza Strip.

1.2 Problem statement

It's obvious from local reports from the intended study settings high rates of unplanned caesarean births in 2020 (11.86% and 21.53% of the total births in Al Tahrer and Al Emiraty, respectively). Although there is a high standardization in general perinatal nursing competency skills content across the Palestinian hospitals' system, the percentage of unplanned caesarean birth is still rising. The total rate of planned and unplanned caesarean birth was 24.7% of total deliveries (MoH, 2020 a) compared to the percentage of 15% the maximum allowed rate recommended by the WHO, 2015). This highest rate is considered alarming for further increasing the burden on the health care system and might be considered an indicator of increasing maternal needs, cost, financial status and other health-related complications. Today, nurses and midwives can reduce unnecessary unplanned caesarean birth and have the necessary knowledge, competence, and skills to help women give birth without medical interventions. Up to the researcher's knowledge, there was no published evidence-based content provided for the midwives and nurses to review the modifiable and non-modifiable factors in the Gaza Strip related to unplanned caesarean birth. Therefore, this study took place to identify the factors associated with the increasing risk of unplanned

caesarean birth and clarify the nursing implications in the clinical settings that could contribute to reducing such modifiable risk factors.

1.3 Justification

Research indicates that maternal morbidity is greater among women who deliver via caesarean birth than among those who birth vaginally (Korb et al., 2020). Efforts have been made to lower these numbers as the incidence of unplanned caesarean birth has risen in recent years. The rate of unplanned caesarean birth in South-administrative hospitals of the Gaza Strip was more than16 % (MoH, 2020a).

The international healthcare community has judged the unplanned caesarean birth rate between 10 and 15 % to be ideal. Based on a remark made by a panel of reproductive health specialists at a 1985 meeting convened by the WHO, there is no justification for any region to have an incidence of unplanned caesarean birth greater than 10–15%. The panel's finding was based on an examination of the scant data available at the time, primarily from northern European nations (WHO, 2015).

1.4 Study objectives

1.4.1 General objective

The purpose of this study is to investigate the association between the selected maternal and other factors and the occurrence of unplanned caesarean birth; and also, to determine the nursing implications in clinical settings during pregnancy and delivery periods which could contribute to reducing the unplanned caesarean birth among pregnant women.

1.4.2 Specific objectives

1. To assess the relationship between sociodemographic characteristics factors and the occurrence of unplanned caesarean birth.

2. To assess the relationship between maternal somatic characteristics and the occurrence of unplanned caesarean birth.

3. To investigate the relationship between maternal previous obstetrical history factors and the occurrence of unplanned caesarean birth.

4. To examine the relationship between antenatal care visits and the occurrence of unplanned caesarean birth.

5. To examine the association between maternal physical activity, and sporting regimen and the occurrence of unplanned caesarean birth.

6. To determine the relationship between the availability of maternal psychological support and the occurrence of unplanned caesarean birth.

7. To identify the association between nursing implications regarding reducing unplanned caesarean birth among pregnant women during pregnancy and delivery periods.

1.5 Research questions

1. Is there a relationship between sociodemographic characteristics and unplanned caesarean birth?

2. Is there a relationship between maternal somatic characteristics and unplanned caesarean birth?

3. What is the relationship between maternal previous obstetrical history and unplanned caesarean birth?

4. What is the relationship between ANC and unplanned caesarean birth?

5. What is the association between maternal physical activity and unplanned caesarean birth?

6. What is the relationship between the availability of maternal psychosocial support and unplanned caesarean birth?

7. What are the nursing implications that are conducted in clinical settings during pregnancy and delivery periods and are they contribute to reducing unplanned caesarean birth?

1.6 Theoretical and operational definitions

1.6.1 Unplanned Cesarean Birth

Unplanned caesarean birth is a surgical procedure that, when undertaken for medical reasons, can save the life of a woman and her baby (WHO, 2018).

In this study the researcher defines the unplanned caesarean birth as a surgical procedure of delivery that is conducted at any one of the study localities which referred to case.

1.6.2 Factors

The factor is a characteristic, condition, or behavior that increases the likelihood of getting a disease or injury (EUPATI, 2021). In this study, the researcher defined risk factors as variables that associated to the occurrence of unplanned caesarean birth according to study objectives.

1.6.3 Nursing implications

Nursing implications are actions that the nurse takes to implement their patient care plan, including treatments, procedures, or teaching processes intended to improve the patient's comfort and health (Santos et al., 2021). In this study, the nursing implications included any midwifery/nursing activities that were conducted during pregnancy at clinical settings during pregnancy and delivery periods as mentioned by the mothers; which could contribute in reducing the risk of unplanned caesarean birth.

1.7 Context of the study

The West Bank and Gaza Strip are two politically distinct Palestinian territories (Annex 1). Gaza, a tiny sliver of land, is bounded to the south by Egypt, to the west by the Mediterranean Sea, and to the East and North by 1948-occupied territories (Annex 2). Gaza is 46 kilometers long, 5–12 kilometers wide, and 365 kilometers square.

The Gaza Strip is divided into five administrative zones: the north, Gaza, the mid-zone, Khan Younis, and Rafah. With a population of 2,048,969 and a population density of 5,154 per km2, it has four towns, fourteen villages, and eight refugee camps. The Gaza Strip's population is extremely young, with a population growth rate of 2.9% and a fertility rate of 3.9% (PCBS, 2020).

1.7.1 Palestinian Health Care System

The Palestinian Health Care System is comprised of the MoH, United Nation Relief and Work Agency for Palestine Refugees in the Near East (UNRWA), non-governmental organizations (NGOs), the non-profit private sector, and the military medical services. The MoH is the primary provider, operating 27 hospitals (14 in the West Bank and 13 in the Gaza Strip) and 444 Primary Health Care (PHC) centers. Importantly, UNRWA operates 140 primary health care facilities (Health Program, UNRWA, 2021).

Despite numerous challenges, the Palestinian MoH collaborates with the international community and the UN, particularly the WHO, to keep the Palestinian health system from collapsing and to achieve the best health indicators in the East Mediterranean region. It provides school health services, health education, human resource development, and referrals to non-MoH institutions for services not provided by government facilities. The Palestinian MoH has 475 PHC centers, a 134% increase from 1994 to 2020 (MoH, 2020 b). The hospital services are provided by the government and non-governmental organizations (NGOs), both of which have significantly improved infrastructure, technical support, and other services over the years by adding new departments and diagnostic equipment and by providing ongoing professional training. In 2021, Gaza Strip had 35 hospitals with a total bed capacity 3587 beds. The MoH operates 2824 beds which constitutes 78.7% of the total beds (MoH, 2022)

1.7.1.1 Al-Tahrer and Al-Emaraty Hospitals

The research was carried out at Al-Tahrer and Al-Emaraty hospitals in the governorates of Khan Younis and Rafah, respectively, which provide obstetric and maternity care. Samples were collected from cesarean and regular birth wards in the selected hospitals. Al-Tahrer hospital (18 caesarean ward beds and 6 regular delivery ward beds) and Al Emaraty hospital (16 caesarean ward beds and 6 regular delivery ward beds) each received a total of 46 beds (12 beds in the caesarean wards and 10 beds in the normal delivery wards). Both Al Tahrer and Al Emaraty hospitals had 14,950 births per year on average (MoH, 2020a).

Chapter Two

Conceptual Framework and Literature Review

2.1 Conceptual Framework

The conceptual framework was created by the researcher after a thorough review of the literature and the researcher's experience in the field. This conceptual framework outlines the anticipated causes and risk factors that may play a role in unplanned caesarean birth (Figure 2.1).

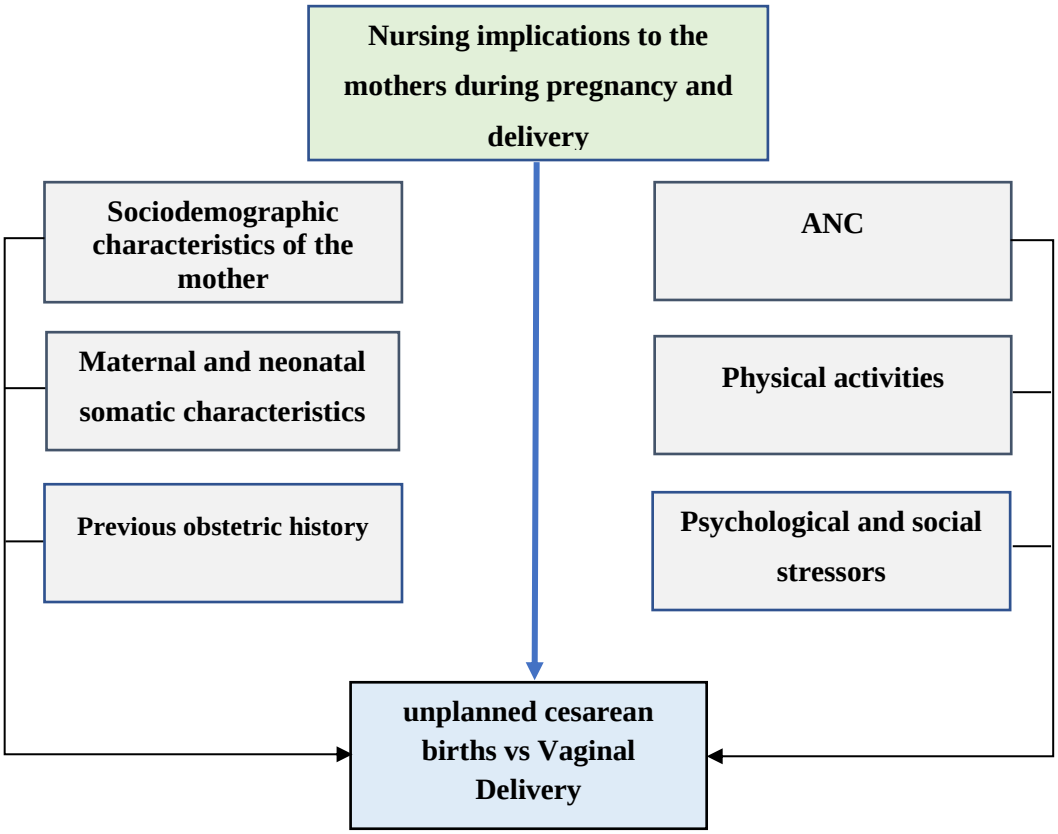

Figure (2.1): Conceptual framework- self developed

2.1.1 Variables of the Study

The current study design concerns studying retrospectively the relationship between multiple independent variables and one dependent variable

2.1.1.1 Independent Variables

Independent variables composed of factors that may contribute to unplanned caesarean birth, nursing implications, and demographic characteristics, which include:

- Maternal and neonate somatic characteristics, previous obstetrical history, ANC, physical activity, and psychological and social support during pregnancy.
- Nursing implications: during pregnancy and delivery periods including; ANC, health education, and psychological support.
- Sociodemographic characteristics include age, residency, level of education, current social status, mother and father's career, number of family members, level of income, and economic level of the family.

2.1.1.2 Dependent Variable:

Unplanned caesarean birth.

2.2 Literature Review

2.2.1 Background about unplanned caesarean birth

Vaginal birth is a safe and natural process. However, in some cases, an unplanned caesarean birth may be necessary to protect the mother and child's health. Unplanned caesarean birth is underutilized in these circumstances. An increased maternal and perinatal mortality and disease. Conversely, overuse (i.e., performing a caesarean section in the absence of an indication) has not been shown to be beneficial and may cause harm as well as waste human and financial resources (Zakerihamidi et al., 2015).

In many countries, caesarean section is the most common major surgical procedure. The global unplanned caesarean birth rate increased by 3.7% per year between 2000 and 2015. The use of unplanned caesareans is marked by extraordinarily wide variation both between and within countries. According to recent research, unplanned caesarean birth rates in 28 countries are less than 10%, indicating underuse. However, the majority of countries in the world have cesarean rates of 15% or higher, which is considered excessive. Because overuse is associated with multiple types of excess harm to women and caesarean-born children, as well as excess cost, policymakers, clinical leaders, researchers, and advocates are calling for an end to the practice (Sakala et al., 2020).

A total of 154 nations with data on unplanned caesarean birth rates from 2010 or later were included in a study of the global description of unplanned caesarean birth rates, which accounted for 94.5% of all live births worldwide in 2018. According to the study, the global prevalence of unplanned caesarean birth was 21.1%, with regional averages of 8.2%, 24.2%, and 27.1% in the least developed, least developed, and most developed regions, respectively. The lowest rates are in Sub-Saharan Africa (5.0%, 39 countries, 88.6% birth coverage), while the highest rates are in Latin America and the Caribbean (42.8%, 23 countries, 91.2% birth coverage) (Betran et al., 2021).

Maternal indications for unplanned caesarean birth include prior elective unplanned caesarean birth, pelvic deformity or cephalo-pelvic disproportion, previous perinatal trauma, prior pelvic or anal/rectal reconstructive surgery, herpes simplex or HIV infection, cardiac or pulmonary disease, cerebral aneurysm or arteriovenous malformation, and pathology requiring concurrent intra-abdominal surgery. Furthermore, abnormal placental implantation (such as placenta previa or placenta accreta), placental abruption, prior classical

hysterotomy, prior full-thickness myomectomy, history of uterine incision dehiscence, invasive cervical cancer, prior trachelectomy, genital tract obstructive mass, and permanent cerclage are indications (Maskey et al., 2019).

The rate of unplanned caesareans is frequently used as an indicator of healthcare quality and thus may reflect improvements in clinical governance at the national and international levels. Unplanned caesarean birth rates, on the other hand, vary by country and even within hospitals within the same country (Zimmo et al., 2018; Betrán et al., 2016).

A trend analysis revealed that, at varying percentages, all regions are experiencing an increase in the incidence rate of unplanned caesarean birth. Unplanned caesarean birth affects 21.1% of women globally. The average of 5% in sub-Saharan Africa indicates underuse, while 42.8% in Latin America and the Caribbean indicates overuse. Over the last three decades, growth has been greatest in Eastern Asia, Western Asia, and Northern Africa (44.9, 34.7, and 31.5 percentage points, respectively), and lowest in Sub-Saharan Africa (3.6 percentage points) and Northern America. According to its prediction, by 2030, 28.5% of women will give birth via unplanned caesarean birth (38 million caesareans yearly), ranging from 7.1% in sub-Saharan Africa to 63.5% in Eastern Asia (Betran et al., 2021).

The International Federation of Gynecology and Obstetrics and WHO recommend the Robson Ten Group Classification System (TGCS) as a global standard for assessing, monitoring, and comparing unplanned caesarean birth rates between countries and institutions (WHO, 2017). The TG unplanned caesarean birth classification divides women into ten categories based on five obstetrical characteristics that are routinely documented and simple to implement (Annex 3). By applying TGCS, unplanned caesarean births are registered based on the women's and pregnancies' characteristics rather than medical indications (Robson, 2015).

In Palestine, and particularly in Gaza, pregnant women receive regular ANC services from ANC clinics run by the UNRWA, the Palestinian MoH, or private clinics. Care for women giving birth is offered in government and private hospitals. Governmental health services are available in all geographical areas and offer services with governmental insurance coverage at a very low cost. Consequently, the majority (73%) of births in Gaza occur in government hospitals. In 2015, the unplanned caesarean birth rates at government hospitals ranged from 16.6% to 26.0% (MOH, 2016).

In most high-income countries, the major contributors to overall unplanned caesarean birth rates were groups 5, 2, and 1 (Lafitte et al., 2018). While in studies from low-income settings such as Ethiopia, with extremely low unplanned caesarean birth rates, the greatest contributors were groups 1, 3, and 5 (Tura et al., 2018). Although the overall unplanned caesarean birth rate in Gaza of 22.9% was relatively low compared with other continents, such as 40.5% in Latin America, 32.3% in Northern America, and 25.0% in Europe, it is still above the WHO criteria (Batieha et al., 2017). Another study indicated that 45.3% of all caesareans were performed on an emergency basis and 55.7% were planned (Batieha et al., 2017).

2.2.2 Percentages of unplanned caesarean birth

The recommended unplanned caesarean birth rate of 10–15% was reported by the WHO (WHO, 2015). Another study showed that unplanned caesarean birth far exceeds planned unplanned caesarean birth (Naeem et al., 2015). There were notable variations between hospitals in rate and odds for unplanned caesarean birth among singleton pregnancies for primiparous and parous women in Palestine (Zimmo et al., 2018). Compared with the hospital with the lowest prevalence of unplanned caesarean birth, the crude ORs were increased in all other hospitals by up to almost fivefold for the primiparous and threefold for parous women (Zimmo et al., 2018). The effect of socio-demographic and maternal antenatal obstetrical characteristics in odds for unplanned caesarean birth in the Zimmo study was in line with previous research, confirming previous unplanned caesarean birth, hypertension disorder, and in vitro fertilization treatment as the strongest risk factors for an unplanned caesarean birth (Pandey et al., 2012).

2.2.3 Causes and types of unplanned caesarean birth

Cesarean births are performed for either planned or unplanned reasons. The most commonly reported reasons for unplanned caesarean birth were prolonged fetal distress and abnormal presentation, such as breech or transverse presentations. This is consistent with the findings of a Bangladeshi study, which found that the most common reasons for unplanned caesarean birth were fetal distress and prolonged obstructed labor (Rahman et al., 2014).

From January 2005 to December 2007, another study was conducted at West Visayas State University to determine the leading indications for unplanned caesarean birth. Dystocia

(30.8%) was the most common reason for an unplanned caesarean birth, followed by malpresentation (23.8%) (Singh et al., 2020).

Many factors have been proposed to explain the high rate of unplanned caesarean births. One reason is that some residents perform unnecessary unplanned caesarean births for training purposes. This is supported by the finding that teaching hospitals had the highest unplanned caesarean birth rate (42.5%). However, the type of women delivering in teaching hospitals may differ from women delivering in other hospitals, which may explain the higher unplanned caesarean birth rates in teaching hospitals. Another reason for the high rate is financial, as hospitals charge more for unplanned caesarean births than for normal vaginal deliveries. This is supported by a higher rate of unplanned caesarean birth in the private sector (37.6%) compared to the public sector (25.2%) (Batieha et al., 2017).

2.2.4 Complications of unplanned caesarean birth

The majority of unplanned caesarean birth interventions go smoothly and safely; however, unplanned caesarean birth is a major, open abdominal procedure that is frequently performed in an emergency setting. The incidence of re-laparotomy after an unplanned caesarean birth is 0.12-0.04 percent (Ragab et al., 2015), with the most common indications being intra-abdominal bleeding, intra-abdominal abscess, or bladder and bowel complications. As a result, several immediate and delayed complications may arise, which the obstetrician must be aware of and capable of correcting (Annex 4) (Field & Haloob, 2016).

In the developed world, the risk of death for unplanned caesarean birth is 13 per 100,000, compared to 3.5 per 100,000 for vaginal birth. Wound infections occur at a rate of 3–15% after an unplanned caesarean birth. The presence of chorioamnionitis and obesity puts the woman at risk for surgical site infection (Saeed et al., 2017).

Women who have had an unplanned caesarean birth are more likely to have complications with subsequent pregnancies; therefore, women who want to have more children should avoid elective caesareans unless medically indicated. After two unplanned caesarean births, the risk of placenta accreta, a potentially fatal condition that is more likely to occur in women who have had previous unplanned caesarean births, is 0.13 percent, 2.13 percent after four, and 6.74 percent after six or more. Along with this, the risk of an emergency hysterectomy during delivery rises (Silver et al., 2006).

The risk of uterine rupture (5 per 1,000), blood transfusion or endometritis (10 per 1,000), and perinatal infant death (0.25 per 1,000) is increased with vaginal birth after cesarean section (VBAC). Furthermore, 20% to 40% of planned VBAC attempts result in unplanned caesareans, with an emergency repeat caesarean carrying a higher risk of complications than an elective repeat caesarean (Prusova et al., 2014).

In contrast to elective repeat unplanned caesareans, VBAC is associated with less maternal morbidity and a lower risk of complications in subsequent pregnancies. Several precautions can be taken during abdominal or pelvic surgery to reduce postoperative complications such as adhesion formation (Arnold & Flint, 2017).

Childbirth before 39 weeks gestation that is not medically indicated (elective) "carries significant risks for the baby with no known benefit to the mother." Newborn mortality at 37 weeks may be up to three times that of 40 weeks and is higher than at 38 weeks gestation. When compared to full-term births at 39 to 41 weeks, these early-term births were associated with higher birth mortality (Main et al., 2011).

The American Congress of Obstetricians and Gynecologists (ACOG) and medical policymakers review research studies and discover more cases of suspected or proven sepsis, respiratory distress syndrome (RDS), hypoglycemia, need for respiratory support, neonatal intensive care unit (NICU) admission, and hospitalization for more than 4-5 days. Rates of respiratory death in unplanned caesarean birth were 14 times higher in pre-labor at 37 weeks compared to 40 weeks gestation, and 8.2 times higher in pre-labor caesarean at 38 weeks. There was no evidence in this review that non-medically indicated (elective) delivery before 39 weeks reduced neonatal morbidity (Main et al., 2011).

Additionally, birth by unplanned caesarean appears to be associated with poorer health outcomes later in life, including overweight or obesity, immune system problems, and digestive issues (Mueller et al., 2019). However, caesarean births do not affect the risk of food allergy in newborns (Currell et al., 2022).

2.2.5 Risk Factors of unplanned caesarean birth

The literature demonstrates that there were a lot of factors that have been associated with reduced likelihood of unplanned caesarean birth; including as an example: delaying hospital admission until labor is well established, continuous labor support by someone in a doula role, intermittent auscultation rather than either on-admission or continuous electronic fetal

monitoring, discontinuation of synthetic oxytocin for induction after the onset of labor, avoiding labor epidural, remaining upright and mobile during the first stage of labor versus lying in bed, and following guidelines related to cervical status and elapsed time for use of synthetic oxytocin and unplanned caesarean birth (Tilden et al., 2015; Bohren et al., 2017; Devane et al., 2017; Anim-Somuah et al., 2018) as which these factors are illustrated in some details as the next:-

2.2.5.1 Socio-Demographic Factors Related to Cesarean Birth

As part of a Streptococcus pneumonia carriage survey in 27 communes, a community-based cross-sectional study was conducted in Nha Trang in October and November 2016. Previous unplanned caesarean birth (30.1%) is the most common cause of unplanned caesarean birth, followed by cephalo-pelvic disproportion (11.2%), oligohydramnios (10.5%), and malposition (9.1%) (Takegata et al., 2020).

Loezenien and colleagues analyzed 1,350 Multiple Indicator Cluster Surveys (MICS) respondents from across the country. The authors claimed a significant difference in unplanned caesarean birth rates between urban (42%) and rural (22.9%) areas and that factors associated with unplanned caesarean birth rates included maternal age at delivery of more than 35 years and higher socioeconomic status deprivation (de Loenzien et al., 2019).

More educated mothers were more likely to have unplanned caesarean birth (OR = 3,373). Compared to low-income mothers, affluent mothers were 1.97 times more likely to have unplanned caesarean birth. ANC visits were significantly associated with unplanned caesarean birth; mothers who had more than four ANC visits had a 4.54 odds ratio of unplanned caesarean birth. First-time mothers over 25 years were more likely to have an unplanned caesarean (aOR = 2.07) than those under 18 years (Islam et al., 2022).

Unplanned caesarean birth is linked to maternal age, education, occupation, parity, and ANC visits, according to a recent study of 4948 women (Manyeh et al., 2018). Socioeconomic status, district of residence, and household head's education are also linked to unplanned caesarean birth, according to the study (Ochieng Arunda et al., 2020). The relationship between advanced maternal age and adverse pregnancy outcomes and higher risk of medical conditions like hypertension and diabetes (Zgheib et al., 2017) could explain why increasing maternal age was associated with an increased risk of unplanned caesarean birth.

According to a recent study, unplanned caesarean birth was higher (44.6%) (Batieha et al., 2017). Over-30 women had a 70% higher risk of unplanned caesarean birth than under-30 women (Rydahl et al., 2019). Other research links maternal age to unplanned caesarean births. A lower BMI reduces the risk of unplanned caesarean birth (Henke et al., 2014; Hoxha et al., 2017). Age and unplanned caesarean birth rate have no plausible linear relationship. This may be due to pelvic rigidity and over-care for premium babies. Although the Jordan study found no difference in unplanned caesarean birth rate based on women's education level, other studies found a significant difference (Batieha et al., 2017).

Gestational weight gain (GWG) is linked to unplanned caesarean birth (Xiong et al., 2016; Gorgal et al., 2012). GWG is an intervention target. Western countries provided most of the evidence linking GWG and unplanned caesarean birth (Voerman et al., 2019). These findings matched Chinese inquiry data (12.7% and 27.6%) (Liu et al., 2012). Both rates were lower than in Western countries (25.8% and 47.2%) and nearby Asian countries, such as Japan (20.8% and 37.2%) and South Korea (20.5% and 35.6%) (Wie et al., 2017).

2.2.5.2 Maternal Clinical Characteristics Related to Cesarean birth

Women with preeclampsia have an increased rate of unplanned caesarean birth (Batieha et al., 2017). Preeclampsia is known to be associated with a higher incidence of intrauterine growth restriction, fetal distress, and prematurity. Therefore, many mothers with preeclampsia are planned to deliver by unplanned caesarean birth. The real danger with preeclampsia is that it prevents the placenta from getting the proper amount of blood needed which decreases the oxygen flow to the baby leading to breathing problems and low birth weight. High blood pressure over time can lead to the deterioration of the mother and baby's organs which may be fatal. Unplanned caesarean birth rate was significantly higher in mothers complaining of gestational diabetes or pregestational diabetes (Batieha et al., 2017). These results are consistent with a study done at the University of Liverpool, which showed a high unplanned caesarean birth rate (67%) in women with type 1 and type 2 diabetes compared to 21% in other women. It has been recently discovered that women with diabetes have impaired uterine contractility (Al-Qahtani et al., 2012).

2.2.5.2.1 Bad Cardiotocography (CTG)

Excessive uterine activity is the most frequent cause of fetal hypoxia/acidosis and it can be detected by documenting tachysystole in the CTG tracing and/or palpating the uterine

fundus. When fetal hypoxia/acidosis is predicted or suspected (suspicious and pathological tracings) and intervention is required to prevent an adverse neonatal outcome, this does not necessarily necessitate a quick caesarean or instrumental vaginal delivery. Frequently, the underlying cause for the formation of the pattern can be recognized and the situation reversed, resulting in the restoration of adequate fetal oxygenation and the return of a normal trace (Ayres-de-Campos et al., 2015). In a cohort study including 23 women, with confirmed COVID-19. The majority had unplanned caesarean birth (68.4 %). 13/16 (81 %) had unplanned caesarean birth while 3/16 (11.8 %) had elective unplanned caesarean birth. Indications for the unplanned caesarean birth included two cases with pathological CTG (Antoun et al., 2020). However, there are no studies showed a direct relationship between unplanned caesarean birth and Bad CTG.

2.2.5.2.2 Anemia and unplanned caesarean birth

Even in developed countries, anemia is common (Camaschella, 2015). Some women even enter pregnancy with low iron stores due to non-gestational factors such as menstrual blood loss. These women are either asymptomatic or exhibit nonspecific symptoms such as fatigue, poor concentration, and/or decreased work productivity, which go undiagnosed in the majority of women (Camaschella, 2015). The current study population of pregnant women has a rate of overt iron deficiency anemia (IDA) of 10.5%, which is comparable to that of young, healthy women in Israel. Other studies found that for otherwise healthy pregnant women with a low risk of an unplanned caesarean birth, uncorrected IDA at labor and delivery remains an independent risk factor for cesarean and adverse maternal and neonatal outcomes (Drukker et al., 2015). The national and institutional unplanned caesarean birth rates during the current study period were 19.5–20.534 and 11.6%, respectively (Drukker et al., 2015). The low cesarean rate in this study may indicate a selection bias; however, this does not diminish the significance of the findings, which show that anemia at birth remains a significant risk even in a population with an a priori low risk of unplanned caesarean birth (Drukker et al., 2015).

A decrease in maternal liver iron content in response to a low iron diet was associated with an increase in transferrin receptor expression and a decrease in hepcidin expression in the liver (of mice), as well as an increase in placental transferrin expression, indicating adaptive responses to ensure iron availability to the fetus (Cao & O'Brien, 2013; Cornock et al., 2013). Another explanation could be iron's antioxidative property, as both iron deficiency and

excess cause free radical mitochondrial damage in rats. Most human and animal studies, however, show a significant overlap between iron deficiency and IDA.

However, serum ferritin levels and marrow iron levels decrease during pregnancy, even in women who take high-iron supplements on a daily basis, raising questions about their true significance in pregnancy and highlighting the need to revise cutoff values (PeaRosas et al., 2015).

2.2.5.2.3 Chronic Diseases and Risk for unplanned caesarean birth

Although the medium- and long-term consequences of unplanned caesarean birth, as opposed to vaginal delivery, on the infant's health are unclear, epidemiological studies suggest that it is associated with a higher risk of developing asthma, food allergy, type 1 diabetes, and obesity during infancy. These findings are important, as the incidence of these diseases in the Latin American pediatric population is also increasing, particularly obesity. Although the link between these diseases and delivery mode remains controversial (Magne et al, 2017).

2.2.5.2.4 Pregnancy Spacing and unplanned caesarean birth

There were fifteen studies included. Eight reported that an interpregnancy interval (IPI) of less than six months or a birth interval (BI) of less than sixteen to eighteen months increased the risk of uterine rupture during a trial of labor following a unplanned caesarean birth. The majority of studies did not find a correlation between birth spacing and vaginal delivery success during spontaneous labor, but the correlation between birth spacing and vaginal delivery after induction of labor was less certain. A BI of less than one year was associated with an increased risk of placenta previa and abruption. Few studies have investigated the effect of birth spacing following a previous caesarean on perinatal outcomes. Reduced risk of maternal morbidity and failed vaginal delivery following a previous unplanned caesarean birth associated with IPI longer than 6-8 months or BI longer than 18 months (Ye et al, 2019).

Another correlation between short interpregnancy interval with pregnancy outcomes according to maternal age, in this cohort study of 148 544 pregnancies, maternal mortality or severe morbidity risks were increased at short interpregnancy intervals among women 35 years or older but not for women aged 20 to 34 years; in contrast, increased risks of adverse fetal and infant outcomes and spontaneous preterm delivery were more pronounced for

women aged 20 to 34 years than for those 35 years and older. Modest increases in risks of small-for-gestational-age birth and indicated preterm delivery at short intervals were not meaningfully different across maternal age groups. The findings of this study suggest that short interpregnancy intervals are associated with increased risks for adverse pregnancy outcomes for women of all ages (Schummers et al., 2018).

2.2.5.2.5 Previous history of unplanned caesarean birth and unplanned caesarean birth

Unplanned caesarean birth in the first delivery markedly increases the risk of repeated unplanned caesarean birth and maternal-fetal complications in the subsequent pregnancy, especially in women with a non-indicated unplanned caesarean birth (Antoniou et al., 2020).

2.2.5.3 Physical Activity and unplanned caesarean birth

To decrease the rate of unplanned caesarean birth, obstetric healthcare providers must identify modifiable factors contributing to the risk of unplanned caesarean birth. Exercise in pregnancy has been shown in several randomized controlled trials and observational studies to decrease the incidence of unplanned caesarean birth (Di Mascio et al., 2016). Not all studies have shown a change in the mode of delivery with exercise during pregnancy, particularly in overweight or obese individuals (Baena-García et al., 2020). In their meta-analysis and systemic review, however, Domenjouz et al. (2014) conclude that exercise in pregnancy is protective against unplanned caesarean birth. Exercise in pregnancy is strongly advocated by the American College of Obstetricians and Gynecologists to reduce the risk of unplanned caesarean birth (Mota & Bø, 2021).

Lower levels of pre-pregnancy fitness as measured by the Army Physical Fitness Test (APFT) did not correlate strongly with a higher rate of unplanned caesarean birth during labor in a cohort of nulliparous active-duty Army women. Another study found no significant differences in pre-pregnancy APFT scores across all APFT events or pre-pregnancy BMI measurements between active-duty women who underwent unplanned caesarean birth in labor and those who had vaginal deliveries (DeGroot et al, 2021). There was no discernible difference in a push-up or sit-up repetitions or run time between soldiers who underwent unplanned caesarean birth and those who delivered vaginally (DeGroot et al, 2021).

Barakat and his colleagues document a 30% lower incidence of unplanned caesarean birth (23 vs 16%) and a 42% lower incidence of operative vaginal delivery (VD) (19 vs 11%) in the exercise group (Barakat et al., 2012). In their meta-analysis and systemic review, Di Mascio and his coworkers found an 18% lower incidence of unplanned caesarean birth and a 9% higher incidence of NVD in normal-weight pregnant mothers who engaged in structured moderate levels of aerobic exercise during pregnancy (Di Mascio et al., 2016). Also, Poyatos-León and his colleagues conclude in their meta-analysis and systemic review that exercise during pregnancy decreases the risk of unplanned caesarean birth (Poyatos-León et al., 2015). In addition, Domenjouz and his colleagues analyzed 16 randomized controlled trials in their systemic review and meta-analysis and concluded a protective effect of exercise on unplanned caesarean birth (Domenjoz et al., 2014). In 2021 Teede published their systematic review and meta-analysis of antenatal diet and exercise interventions finding that exercise significantly reduced the unplanned caesarean birth rate in the intervention group (19.3%) compared to the control group (22.1%) (Teede et al., 2022). Interestingly, in their meta-analysis and systemic review of exercise among overweight and obese women during pregnancy, that a despite of decreased incidence of GDM and hypertensive diseases of pregnancy in this cohort, exercise did not lead to a significantly lower incidence of unplanned caesarean birth (Magro Malosso et al., 2019). In their randomized controlled trial of Chinese women, Wang et al. also found a lower but not statistically significant difference in the incidence of unplanned caesarean birth in the exercise vs control group among overweight and obese women (Wang et al., 2018).

2.2.5.4 Psychological and social stressors during pregnancy and unplanned caesarean birth

Psychological status has a large impact on the mood of delivery, this factor may include fear, stress, poor quality of sleep, disturbance of mental health, depression, and others. All of these factors enhance the mood of delivery (unplanned caesarean birth). Poor mental health, especially anxiety and depression, during pregnancy could increase the risk of unplanned caesarean birth. Therefore, screening protocols for mental health status and prenatal counseling sessions are recommended for pregnant mothers to increase their ability to make well-informed decisions regarding types of delivery (Moameri et al., 2019).

In other words, poor sleep during the third trimester of pregnancy contributes to unplanned caesarean birth. Women who reported less than 6 hours of sleep per night during the last

month of pregnancy had a significantly longer mean duration of labor (29 hours vs. ≥20 hours) and a higher rate of caesarean birth (Hui & Chiong, 2017). Another study gets a comparing between stress and a lack of social support during pregnancy to determine they are risk factors for an unplanned caesarean birth. A higher incidence of unplanned caesarean birth is linked to fear of labor rather than a general worry. Women who have a great fear of birthing during pregnancy may be encouraged to attend antenatal classes or seek psychological treatment if their worry is extremely severe (Wigert et al., 2020).

2.2.5.5 Antenatal Care (ANC) and unplanned caesarean birth

High unplanned caesarean birth rates are an international concern. Contributors to these high rates include biological and administrative factors, but the roles of nurses and patterns of nursing care delivery in the risk of unplanned caesarean birth are less clear and have been understudied. The role of the nurse during labor and delivery varies based on institutional policy, unit practice, and nurse preference. The use of continuous electronic fetal monitoring, epidural analgesia, and artificial rupture of membranes has increased dramatically over the past two decades. These changes have a significant impact on nursing care.

The amount of support provided by nurses to laboring women has been empirically studied using work sampling techniques, in which randomly selected periods were selected for observation and nurses' activities were recorded during those times (Gagnon & Waghorn, 1996). These studies revealed that nurses spent approximately 7–9% of their time providing laboring women with supportive care. A lack of emphasis on supportive care in nursing education and unit cultures that prioritize technological expertise may contribute to low levels of personal contact. Only one-fifth of nurses' time was spent in the room with the women (Gagnon & Waghorn, 1996).

There is a dearth of studies on the role of nursing care as an independent predictor of, or protector against, unplanned caesarean birth. Only one study directly examined the likelihood that a nurse would influence the delivery outcome of laboring women (Radin et al., 1993). Births were attributed to a nurse if she had been present at the time of birth as noted in the obstetric log. The nurses who had attended more than 15 birth were categorized into high, medium, and low unplanned caesarean birth quintiles. Large differences in the unplanned caesarean birth rates of nurses in the lowest and highest quintiles could not be explained by differences in maternal age and gravidity, attendance at childbirth class, insurance status, reliance on public assistance, physician attendant at labor, use of epidural analgesia, augmentation of labor, cervical dilation when the nurse assumed the care, infant

weight, or gestational age, according to results based on 338 births. The study concluded that nursing care during labor is a significant factor influencing unplanned caesarean birth rates (Radin et al., 1993). Due to the possibility of analytical bias, the validity of these conclusions cannot be evaluated (the same study data may have been used to both define and test the association, i.e., post hoc analyses).

2.3 Previous Studies

2.3.1 Local Studies

The purpose of the Alshawish and Zaidan. (2021) study was to determine the prevalence of non-obstetric and obstetric risk factors for unplanned caesarean birth among Palestinian women. Using a standardized questionnaire, a descriptive case-control study was done to assess the independent risk factors associated with unplanned caesarean birth versus NVD. A total of 300 participants (150 cases with unplanned caesarean birth and 150 controls with NVD were selected from three hospitals in Palestine and were questioned in person. The following independent risk factors were shown to be significantly associated with an elevated incidence of unplanned caesarean birth. Overweight before and during pregnancy; having edema, anemia, bleeding, or high blood pressure during pregnancy; mal-presentation of the fetus; higher level of education; living in the village; history of eclampsia; previous unplanned caesarean birth; advanced gestational age; newborn head circumference; use of pregnancy fixatives; and use of Intra-Uterine Device (IUD) contraceptive methods. However, the independent factors that could help patients avoid a unplanned caesarean birth were pre-pregnancy activity, an increase in prenatal visits, and the use of safe medicinal herbs.

The purpose of the Zimmo et al. (2018) study was to compare unplanned caesarean birth rates and probabilities among singleton pregnancies in six Palestinian government hospitals. Using a prospective population-based birth cohort study in six Palestinian government hospitals' Obstetric departments. Participants 32 321 women planned for vaginal delivery between 1 March 2015 and 29 February 2016. Using logistic regression, the odds ratios (ORs) and 95% CI for unplanned caesarean birth were estimated. The primary outcome was the adjusted ORs of unplanned caesarean birth among singleton pregnancies at five Palestinian hospitals vs the reference institution (Hospital 1). The prevalence of unplanned caesarean birth varied significantly amongst hospitals, ranging from 5.8% to 22.6% among primiparous women and from 4.8% and 13.3% among parous women. Among primiparous

women, ORs for unplanned caesarean birth increased in all other hospitals compared to the reference hospital (1.95–4.75). These disparities were less obvious in parous women, with crude ORs ranging from 1.37 to 2.99. After adjusting for potential confounders, the ORs were lowered but remained statistically significant, except for one hospital among women who were pregnant.

The study by Zaidan. (2016) aims to identify the most prevalent non-obstetric and obstetric risk factors for unplanned caesarean birth in Jenin. Using a standardized questionnaire, a study was done to assess the independent risk variables associated with unplanned caesarean birth. There was a total of 300 participants; 150 had unplanned caesarean birth and 150 had NVD. These women were chosen from three Jenin hospitals. 2016. Overweight before and during pregnancy, having edema, anemia, bleeding, or high blood pressure during pregnancy, malpresentation of fetus, higher level of education, living in a village, history of eclampsia, previous unplanned caesarean birth, more gestational age, newborn head circumference, and use of pregnancy fixatives and IUD contraceptive methods. Independent factors that may assist women to avoid unplanned caesarean birth include pre-pregnancy activity, an increase in ANC visits, and the use of safe medicinal medicines.

2.3.2 International Studies

The main objective of a previous study was to examine unplanned caesarean birth trends and to identify medical and sociodemographic indications linked with caesarean procedures in Jordanian health sectors. In Jordan, between 1982 and 2017 number of 2,8 million birth records were retrieved and analyzed. Trends in unplanned caesarean birth were compared across health sectors (government, university, private, and military institutions) and with England, Lebanon, and the Islamic Republic of Iran. Indications for unplanned caesarean birth were determined using retrospective data derived from 3799 unplanned caesarean birth in 2 hospitals (governmental and private). During the research period, the unplanned caesarean birth rate in Jordan rose from 5.8 (1.9%) in 1982–1987 to 31.0 (0.7%) in 2015–2017. In Jordan, the unplanned caesarean birth rate was originally lower (1983–2006), than comparable (2007–2014) to that of England, but lower than that of Lebanon (2011–2016).

In Jordanian health sectors, unplanned caesarean birth rates in 2015–2017 were: 40.4 (2.6%) university, 39.1 (1.8%) private, 36.1 (0.2%) military, and 27.4 (0.7%) governmental. The most common indications were previous unplanned caesarean birth (33.6%), abnormal presentation (20.3%), and patient requests (16%) (Salem, 2021).

A study sought to identify the risk variables connected with Lebanon's high unplanned caesarean birth rates. This study is based on a sample of 29,270 pregnant Lebanese women from 2000 to 2015. 14,327 women gave birth via unplanned caesarean birth and 14,943 women gave birth vaginally. Using the SPSS statistical tool, logistic regression was used as a statistical technique to identify the risk factors for unplanned caesarean birth. The study comprised 29,270 pregnant women; 49% had an unplanned caesarean birth and 51% gave delivery vaginally. Repeat unplanned caesarean birth accounted for 23% of deliveries, while vaginal delivery after caesarean accounted for only 0.2%. In addition, weekdays were related to an increase in the number of unplanned caesarean birth performed. Based on a logistic regression analysis of our data, the risk factors related to the rise in unplanned caesarean birth rates were advanced mother age, unplanned caesarean birth, malpresentation of fetus, multiple birth, protracted pregnancy, prolonged labor, and fetal distress (Zgheib et al., 2017)**.**

Another study aimed to investigate the association between advanced maternal age and unplanned caesarean birth in a Danish population, as well as the influence of demographic, anthropometric, health, and obstetric factors on this association. This study is based on a national cohort study of all birth in Denmark between 1998 and 2015 (N = 1,122,964). Maternal age less than 30 years acts as a reference with the following age categories: (30–34 years); (35–39 years), and (40 years and above) (40 years and above). The results of multivariate regression models with adjustments for demographic, health, pregnancy, fetal, and obstetric variables were stratified by parity. In general, a correlation between maternal age and unplanned caesarean birth was discovered. After adjusting for relevant confounding variables, the risk estimate changed just marginally. In comparison with the reference category, nulliparous women aged 35-39- years had twice the risk for an unplanned caesarean birth (aOR= 2.18), and for women of 40 years or above, the risk was more than quadrupled (aOR 3.64). For multiparous women between the ages of 35 and 39, the risk was moderate, but 1.56; for those 40 and older, the AOR was 2.02 (Rydah et al, 2019)**.**

Another study identified the unplanned caesarean birth rate and associated factors in two rural southern Ghana districts. The database of Dodowa Health and Demographic Surveillance System was queried for information on the pregnancies, birth, and socio-demographics of 4948 women who gave birth between 2011 and 2013. Using logistic regression, the correlations between independent and dependent variables were examined concerning the unplanned caesarean birth. The overall unplanned caesarean birth rate during the study period was 6.59%. Women aged 30–34 were more than twice as likely to have an

unplanned caesarean birth as those under 20 (OR: 2.16). However, women aged 34 and older were more than three times as likely to receive an unplanned caesarean birth as those under 20 (OR: 3.73). The likelihood of having an unplanned caesarean birth was 65% and 79% more likely among those with Primary and Junior High School educations, respectively (OR: 1.65, and OR:1.79). The likelihood of having an unplanned caesarean birth decreases by 65%, 37%, and 35% for women with 2, 3, and 3+ pregnancies, respectively (OR:0.60, OR: 0.37, and OR:0.35). There were higher probabilities of 36%, 52%, and 83% for women in the poorest, middle, and wealthiest wealth quintiles, respectively (OR: 1.36, OR: 1.52, OR: 1.83). Participants from the wealthiest quintile were more than twice as likely to have an unplanned caesarean birth (OR: 2.14). 76% fewer women from the district of Ningo-Prampram will have an unplanned caesarean birth (OR: 0.76). Women whose household leaders had at least a Junior High School education were 45% more likely to have an unplanned caesarean birth (OR: 1.45) (Manyeh et al., 2018)**.**

A study aimed to investigate the nonclinical risk factors of unplanned caesarean birth and the similarities and differences between developed and developing nations that influence unplanned caesarean birth. Using electronic databases such as PubMed, JSTOR, SpringerLink, ScienceDirect, etc., the available literature was searched. In nearly all studies of industrialized and developing nations, the mother's age is the most prevalent risk factor for unplanned caesarean birth. In addition, the kind of hospital is a significant determinant of unplanned caesarean birth, as shown in more than half of the research of poor nations and several studies of rich nations. However, it is also shown that the major findings of unplanned caesarean birth vary according to the level of development. In the majority of research conducted in affluent nations, unplanned caesarean birth is strongly linked with maternal age and birth weight. In underdeveloped nations, however, the majority of research indicates that unplanned caesarean birth is strongly correlated with the mother's age, maternal education, type of hospital, place of residence, number of ANC visits, and parity (Sk and Barua, 2018).

A study included a retrospective review of patient records that included 2,967 pregnant women who had a caesarean or vaginal delivery between July 1, 2012, and June 30, 2013. Data were entered twice into EPI-INFO 3.5.2 and analyzed using SPSS. Using a binary logistic regression model, independent factors linked with unplanned caesarean birth were identified. This survey found that 25.4% of women had unplanned caesarean birth. The main obstetric indications for unplanned caesarean birth were obstructed labor (30.7%), fetal

distress (15.9%), and abnormal presentation (13.4%). The odds of undergoing an unplanned caesarean birth were higher among rural mothers and those who reported pregnancy risk factors, while they were lower among mothers aged 15–19 years (Abebe et al., 2015)**.**

In a study conducted to investigate the impact of late-trimester walking exercise on the pregnancy outcome of low-risk primipara. From July 2012 to June 2013, Shengjing Hospital, China Medical University, conducted a prospective randomized controlled research on 123 low-risk primipara who received routine prenatal care. In addition, informed consent was obtained. In the same time frame, 116 cases of additional low-risk primipara were included in the control group. Except for frequent structured walking exercise from 34 weeks of gestation through delivery, the experimental group received the same consultation supervision as the control group. Inter-group variations in delivery mode, mean body weight gain per week after 34 weeks of pregnancy, labor duration, labor pain perception, newborn weight, and neonatal birth condition were identified and evaluated. The rate of caesarean section was 12.7% and 18.5% for the two groups, respectively, as was the mean body weight gain per week after 34 weeks of gestational age (0.41 0.13) and (0.56 0.09) kg, the labor pain score is 6.1 1.9 and 7.6 2.3, the duration of labor (12 4) and (15 6) h, the neonatal birth weight (3.4 0.3) and (3.7 0.6) kg, and the rate of macrosomia 4.5% and 7. The distinctions were statistically significant (P 0.05). Preterm birth rates were 5.5% and 4.6%, premature membrane rupture rates were 15.5% and 13.9%, and newborn asphyxia rates were 2.7% and 3.7%, respectively. The study concluded that walking exercise during the late trimester is simple, safe, and beneficial, and it may improve the pregnancy outcomes of low-risk primipara (Li et al., 2014).

Another study sought to ascertain the current cesarean birth rate and associated socio-demographic characteristics among mothers in Nha Trang, south-central Vietnam. In October and November of 2016, a community-based cross-sectional study was done as part of a Streptococcus pneumoniae carriage survey in 27 communes of Nha Trang city. 120 mothers and their children under the age of two were chosen at random from each commune. Mothers were asked to answer standardized questions about their socio-demographic information and birth method. To investigate the relationships between socio-demographic characteristics and mode of birth, multivariate logistic regression was used. 1396 (44.3%) of the 3148 individuals had cesarean deliveries. Maternal age (30 years old), having another child in school or kindergarten, monthly income greater than 644 USD, gestational weeks at birth greater than 42 weeks, and low (2500 g) or high (3500 g) birth weight were all related

with a higher chance of cesarean birth. The CS rate obtained in this study was more than double what the World Health Organization recommends, which is consistent with the prior national study in Vietnam. Further investigation into the non-medical cause of the higher CS rate is advised (Takegata et al., 2020).

To investigate cesarean delivery, its socioeconomic characteristics, and newborn survival outcomes in Kenya and Tanzania. We used binary logistic regression to evaluate cross-sectional demographic and health survey data on neonates born in Kenya (2014) and Tanzania (2014) health facilities (2016). Cesarean delivery rates ranged from 5% in uneducated rural Tanzanian women to 26% in educated urban Kenyan women and 37.5% in urban Tanzanian managers. Overall, mothers from the richest households had a lower risk of cesarean delivery, with an adjusted odds ratio (aOR) of 1.4 (95% CI 1.2-1.8), those who were insured had an aOR of 1.6 (95% CI 1.3-1.9), those who were highly educated had an aOR of 1.6 (95% CI 1.2-2.0), and those who were unemployed had an aOR of 1.7 (95% CI 1.3-2.2). Cesarean delivery was substantially linked with newborn death in Kenya and Tanzania, with an overall aOR of 1.7 (95% CI 1.2-2.7) as compared to normal deliveries and when controlling for maternal risk variables. However, statistical significance was lost when fetal risk factors and the number of prenatal care visits were taken into account, yielding an aOR of 1.6 (95% CI 0.9-2.6). In Kenya and Tanzania, disparities in access to cesarean delivery have grown. There is a higher risk of cesarean-related infant death. The safety and/or choice of cesarean delivery, whether medically required or not, is best handled on an individual basis at the health-facility level. However, policy actions to eliminate incentives, promote equal access, and increase accountability are required to prevent needless cesarean deliveries through informed decisions. Efforts to avoid unwanted births among teens, as well as health professional training and ongoing research to enhance newborn outcomes, are critical Ochieng (Ochieng Arunda et al., 2020).

A randomized clinical research was done on 102 pregnant women who were referred to Rafsanjan's comprehensive health service centers and were randomly assigned to one of two groups from August 2018 to February 2019. From the 34th week of pregnancy until the time of birth, the intervention group walked four times per week for 40 minutes. The control group only received standard prenatal care. Data on delivery outcomes were collected from the patients' medical files in the hospital and analyzed using SPSS software version 22 and Chi-square and independent t-tests.

The results showed that the intervention group's Bishop Score was considerably higher than the control group's (P 0.05). Furthermore, there was a statistically significant difference between the intervention and control groups in the duration of the third phase of birth, spontaneous labor, induced labor, cesarean section, and instrumental delivery (P 0.05). There was no statistically significant difference between the two groups in terms of the duration of the first and second stages of delivery, as well as the Apgar score at the first and fifth minutes (P > 0.05). The study concluded in walking during late pregnancy may improve the Bishop score, boost spontaneous labor initiation, and reduce induction, cesarean, and instrumental delivery without affecting the neonate's Apgar score (Shojaei et al., 2021).

A study conducted to investigate the impact of maternal, socio-demographic, and pertinent variables on Caesarean delivery in Bangladesh's northern region. This study is based on 1142 delivery cases from four private hospitals and four public hospitals from January to March of 2010. The study employed a cross-sectional design, with data gathered through simple random sampling. To begin data analysis, the chi-square and Fisher exact tests were used to do an initial bivariate analysis. Second, the logistic regression model is used to determine the risk factors linked with c-section. Finally, the most influential risk factors were identified using a stepwise regression analysis. Nine of the 17 risk factors were found to be strongly linked with the mode of delivery. Previous c-section, pregnancy-induced leg swelling, extended labor, mother education status, maternal age greater than 25 years, low birth order, baby length greater than 45cm, and irregular intake of a balanced meal remained independently significant for caesarean delivery. A P0.05 value was considered statistically significant. Maternal problems were shown to be more prevalent in public hospitals than in private hospitals, as were demographic features. The findings of this study revealed that the aforementioned factors may influence the health-seeking behavior of women in Bangladesh's northern area (Rahman et al., 2014).

To compare Caesarean section rates between mothers of advanced age (35 to 40 and over 40 years) and those aged 20 to 34 years, utilizing the Robson categorization system to investigate other maternal variables. Between April 1, 2011, and March 31, 2012, a total of 134 088 hospital deliveries in Ontario were classified using Robson's ten mutually exclusive and completely inclusive classification categories. Maternal age, health condition, obstetrical complication, assisted reproductive technology use, smoking during pregnancy, and socioeconomic level were used to stratify records from the three Robson groups that contributed the most to the overall CS rate. CS rates increased with maternal age, with rates

of 26.2%, 35.9%, and 43.1% in women aged 20 to 34, 35 to 40, and over 40, respectively. Previous Caesarean section, primiparity, conception via assisted reproductive technology, chronic hypertension, gestational diabetes, diabetes mellitus, preeclampsia, placenta previa, placental abruption, or large for gestational age infants were the top three Robson groups by contribution to CS rates. Despite the fact that the prevalence of these factors rose with maternal age, moms aged 35 with one or more health issues or obstetrical complications had greater CS rates than mothers aged 20 to 34 with the same conditions or complications. Increased rates of CS in older women are not explained solely by health problems and obstetrical difficulties. Individual care provider and mother choices on CS rates may play a crucial influence and warrant more investigation (Janoudi et al., 2015).

Chapter Three

Material and Methods

3.1 Study design

This study utilized a quantitative, analytical case-control design; with matching in a ratio of 1:1 for possible confounder variable, namely the location of delivery. This design is a common method of analyzing associations between clinical outcomes and potential risk factors. Matching cases to controls based on known confounding variables can decrease bias and allow the researcher to assess the association of interest with increased precision. Furthermore; the design was selected for the reason that increasingly used to investigate the causes of the outcome (LeBrun et al., 2019).

3.2 Study Setting

The study was conducted in the two governmental hospitals with obstetric and maternity services located in the south of the Gaza Strip, namely Al-Tahrer and Al- Emaraty hospitals in Khan Younis and Rafah governorates respectively.

3.3 Study period

This study lasted 12 months, beginning in November 2021 and ending in November 2022. The actual time for the data collection period began on 20 August 2022 and ended on 25 September 2022.

3.4 Study Population

The study population included all postpartum women of unplanned caesarean birth as cases and postpartum women of normal delivery as control were reported as 14,950 (MoH, 2020a). The case and control women have the same eligibility criteria, except for the type of delivery.

3.5 Sampling and sample size

The selection procedure goes on by matching cases and controls in a ratio of 1:1 to meet the purpose of the current study. According to Steven (2012) sample size formula (Annex 5), the suggested optimal sample size for data collection is about 375 participants. The

researcher increased the sample size to 400 for potential errors in questionnaires' fillings, 200 as cases, and 200 as control.

3.6 Study tools

For purpose of data collection, a specifically designed questionnaire was constructed in English language (Annex 6) and the Arabic translated version (Annex 7); which includes: -

3.6.1 Physiological Tool of Data Collection

Maternal Hb level and height were recorded from the mother's medical file (MCH handbook).

Weight at the delivery time: The women's weight at delivery was measured using a portable weighing device by the researcher. Then BMI was calculated.

3.6.2 Self-report Tool of Data Collection

The self-constructed questionnaire was designed in the way of closed-end questions. Mothers were enquired about the following respective domains: -

Domain I: Socio-demographic characteristics of the mothers; age, residency, level of education, current marital status, career, husband's career, family members, and income level.

Domain II: Maternal and neonatal somatic characteristics; mother's weight instantly before pregnancy, mother's weight at delivery, average pregnancy weight gain, HB level at delivery, gestational age at delivery, and neonatal weight at delivery.

Domain III: Previous obstetric history; gravidity, parity, duration between the last pregnancy and the previous delivery, previous unplanned caesarean birth, fetal presenting part at delivery, and if a safe transfer to the hospital has occurred.

Domain IV: Antenatal care visits including questions about attendance to ANC, period of starting of ANC etc.

Domain V: Nursing implications during pregnancy and delivery periods including ANC, health education, and psychological support.

3.7 Validity

3.7.1 Face and content validity of the instruments

The questionnaire was validated by a panel of experts (Annex 8) to determine the adequacy of the instrument to measure what was intended to be measured (Schrepp, 2020), thereby increasing confidence in the questionnaire. The panel of experts specialized in a variety of fields; namely: midwifery, gynecologist, research methodology, and biostatistician.

3.8 Eligibility criteria

3.8.1 Inclusion criteria

Eligible participants were women who:

- Willing to participate in the study
- Delivered either unplanned caesarean birth (case) or normal delivery (control) at one of the studied settings and during the period of the study

3.8.2 Exclusion criteria

Excluded participants were women who:

- have planned caesarean birth
- have previous two unplanned caesarean birth

3.9 Data collection

An interviewing questionnaire to save time and acquire a higher response rate was carried out. To improve the clarity of the questions for the participants, questionnaires were distributed to the selected mothers in the Arabic language. The questionnaire was enclosed with a consent form (Annex 9) that stated that their participation was entirely voluntary. The time allotted for each questionnaire mother was approximately 30 minutes. Data were collected on 20 August and ended on 25 September 2022. Furthermore, the medical records of the selected mothers were reviewed to identify past maternal gyno-obstetrical history.

3.10 Data processing and analysis

Data were entered, cleaned, and analyzed by using the statistical package for social sciences (SPSS) version 25. Descriptive statistics including frequency and cross-tabulation were used in both groups of mothers, unplanned caesarean birth (cases) and normal birth (controls), to describe the selected maternal variables. Additionally, univariate analysis was carried out by computing unadjusted matched ORs and their 95% confidence interval (CI). Furthermore, multivariate analysis was executed in the two integrated steps: Model I included all maternal predictors that resulted after the stepwise backward selection for variables with univariate p-value < 0.20 as recommended by (Hosmer & Lemeshow, 2013). In model II we included all significant maternal variables of model I and other. The advantage of applying the logistic regression model becomes evident when the effects of many exposure variables are modelled in the presence of many confounders. Principal confounding factors namely, demographic characteristics (parental age, parental education, current social status, mother and father careers, family members, economic level of the family). All p-values were two-tailed and were considered significant when $p < 0.05$.

3.11 Administrative and ethical considerations

- An approval letter was gained from the Helsinki Committee and MoH (Annex 10 and Annex 11 respectively)
- A facilitation letter from Al-Quds University to conduct the study (Annex 12)
- The eligible respondents had full right to participate, refuse or withdraw from the study.
- Anonymity, and confidentiality were maintained during data collection and the whole of the study).

3.12 Pilot study

Before beginning the actual data collection, a pilot study was conducted and included 20 mothers, ten with post-unplanned caesarean birth as cases and ten with normal delivery as controls, to test the response rate, ensure the validity of the questionnaire, and identify areas of ambiguity. The selected participants of the pilot study were excluded from the actual study as minor modifications to the questionnaire were made; next, a second pilot study was done for another 20 participants and included in the analysis.

3.13 Limitations of the study

- The study results might be exposed to recall bias from the participants as the study designed was a case-control study, and the given data were acquired retrospectively.
- The study results are representative of the South Gaza strip governmental hospitals rather than including all governmental and non-governmental hospital.
- Lack of literature related directly to unplanned caesarean birth; as mostly focused on planned CS.

Chapter Four

Results

This chapter aims to deal with the practical part related to the results of this study. Descriptive analyses of the study population including the percentage of unplanned caesarean birth in the target group and demographic characteristics of the study population are given as a starting point, followed by critical univariate analysis of the study variables to show the associations between maternal risk factors and the incidence of unplanned caesarean birth in Gaza strip. Furthermore, the researcher aims to end each subdivision of this chapter with brief analytical results of multivariate analyses to control the possible explanatory variables in this study.

4.1 Descriptive analysis of the study participants

The present study is a case-control included 400 women (200 unplanned caesarean birth as cases and 200 normal deliveries as controls). The sample was matched in the number of cases and controls place of delivery (100 cases and 100 controls from each hospital).

4.1.1 Comparison between cases and controls regarding age

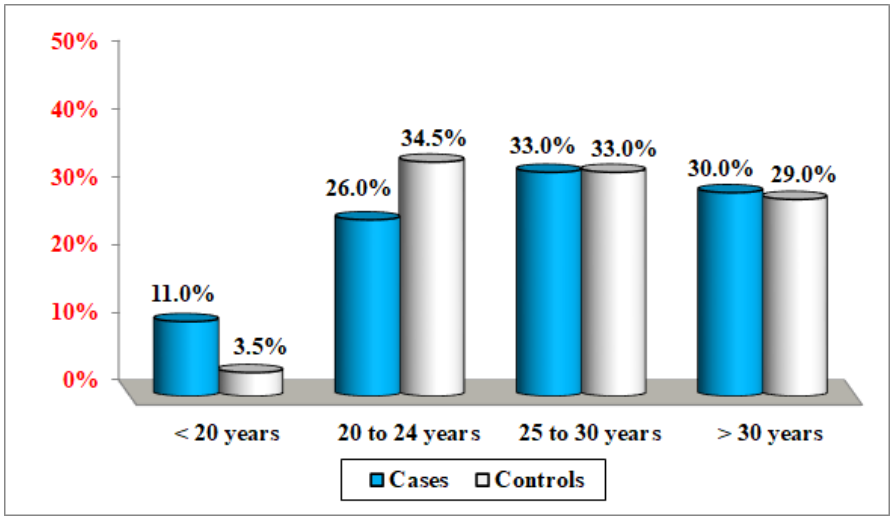

Figure (4.1): Comparison between cases and controls regarding age

Figure 4.1 shows the distribution of the participants by age. The number of cases aged less than 20 years, 20-24 years, 25-30 years and more than 30 years were 22 (11%), 52 (26%), 66 (33%), and 60 (30%). The number of controls was 7 (3.5%), 69 (34.5%), 66 (33%) and 58 (29%), respectively.

4.1.2 Comparison between cases and controls regarding residency

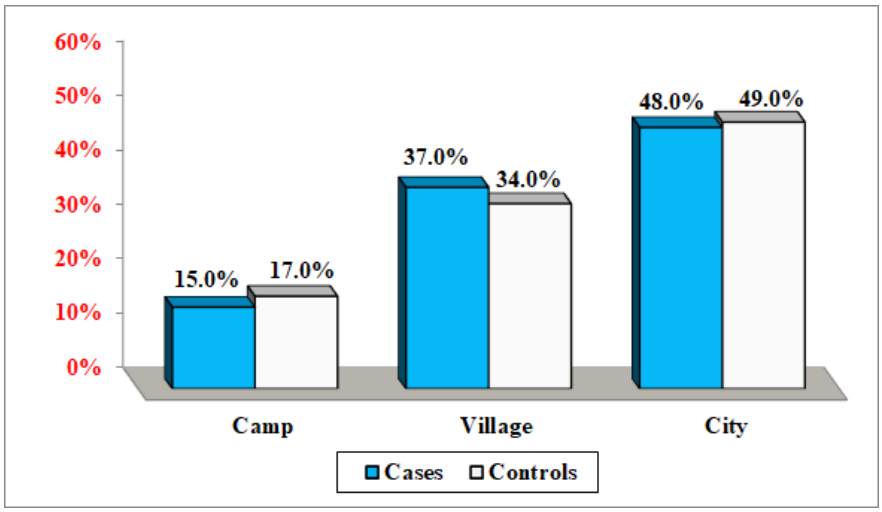

Figure (4.2): Comparison between cases and controls regarding residency

Figure 4.2 shows the distribution of the participants by residency. The number of cases living in a camp, village, and city was 30 (15%), 74 (37%), and 96 (48%); while 34 (17%), 68 (34%), and 98 (49%) in controls, respectively.

4.1.3 Comparison between cases and controls regarding the level of education

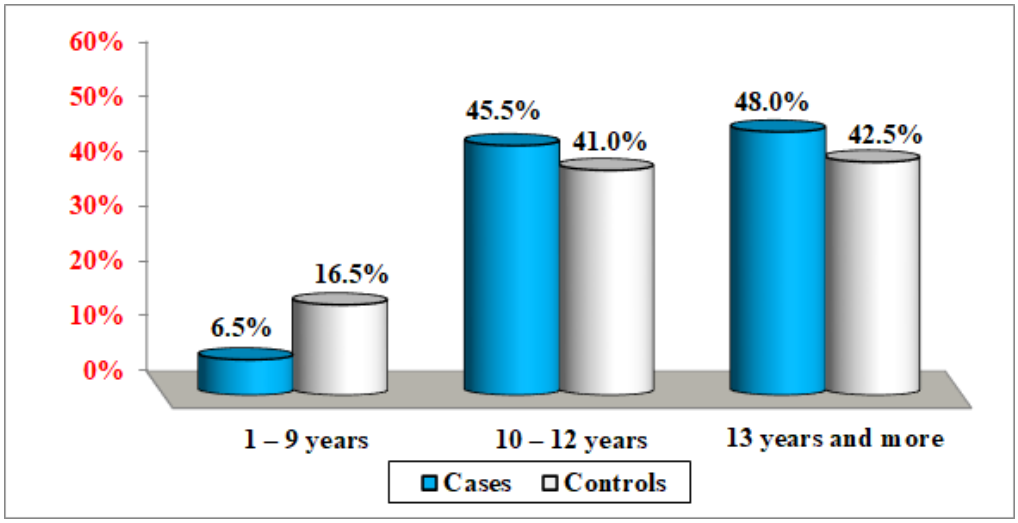

Figure (4.3): Comparison between cases and controls regarding the level of education

Figure 4.3 illustrated the distribution of the participants regarding their level of education. The level of education from 1 to 9 years lower among cases compared to controls (22 (11%) vs. 33 (16.5%), respectively). While the level of education from 10 to 12 years and 13 years

and higher among cases compared to controls ((91 (45.5%) vs. 82 (41%) for 10 to 12 years and 96 (48%) vs. 85 (42.5%) for 13 years and more, respectively).

4.1.4 Comparison between cases and controls regarding current marital status

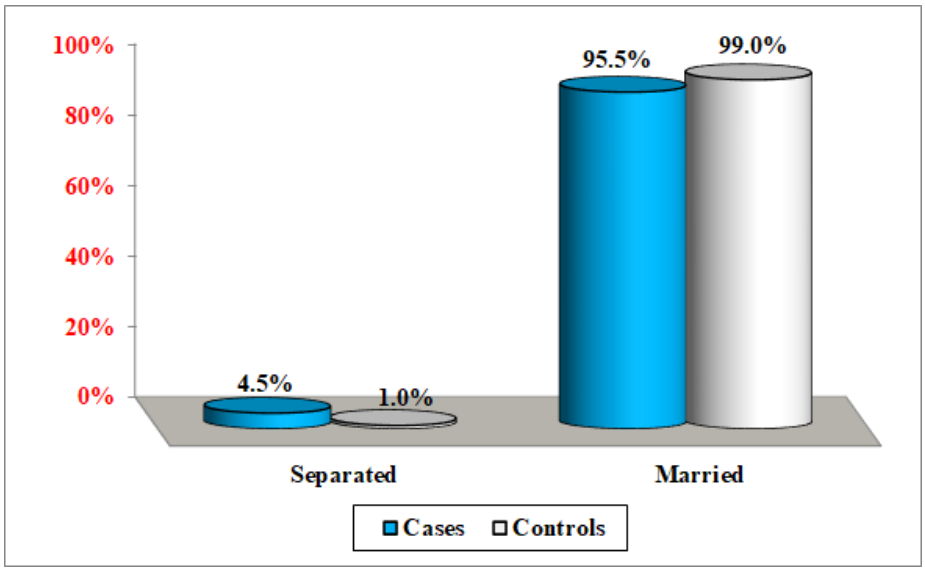

Figure (4.4): Comparison between cases and controls regarding current social statues

Figure 4.4 illustrated the distribution of the participants regarding current social status. The results showed that married among cases were lower than controls (9 (4.5%) vs. 198 (99.0%), respectively). While the separated woman among cases is higher than controls (9 (4.5%) vs. 2 (1.0%), respectively).

4.1.5 Comparison between cases and controls regarding husband and mother career

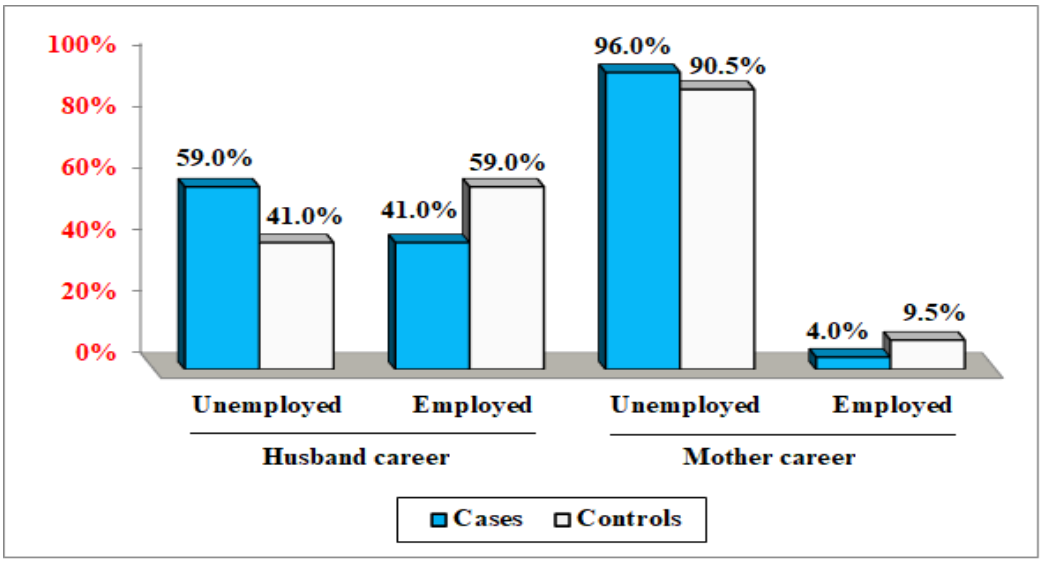

Figure (4.5): Comparison between cases and controls regarding fathers and mothers' career

Figure 4.5 illustrated the distribution of the participants regarding husband and mother careers. The results showed that husbands employed among cases were lower than controls; 82 (41%) vs. 118 (59%) respectively. Also, the results showed that the mother employed among cases was lower than controls 8 (4%) vs. 19 (9.5%) respectively.

4.1.6 Comparison between cases and controls regarding family members

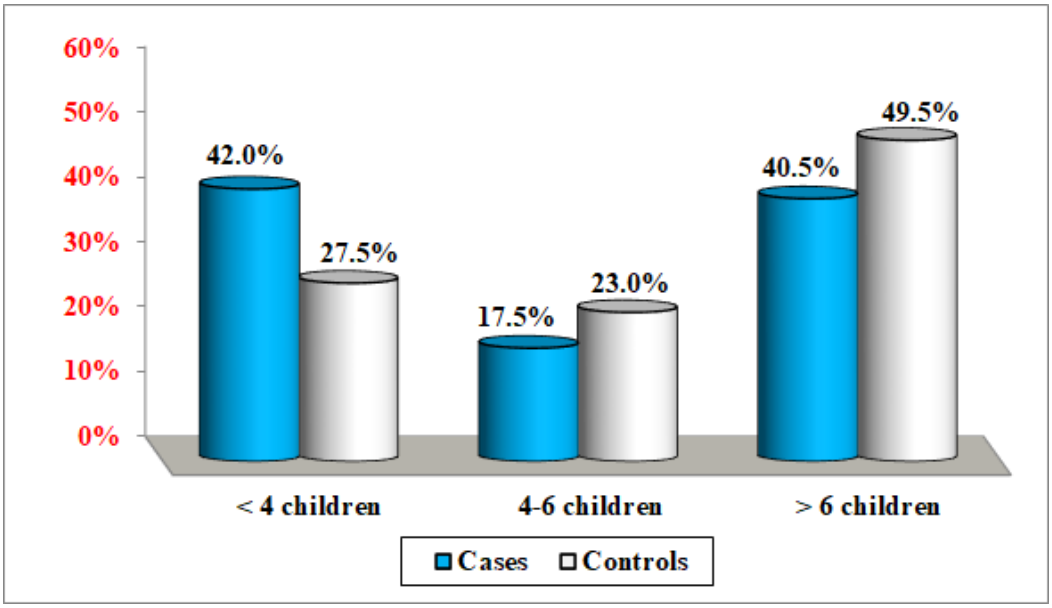

Figure (4.6): Comparison between cases and controls regarding family members

Figure 4.6 illustrated the distribution of the participants regarding family members. The results showed that family members less than 4 children were higher among cases compared to controls (84 (42%) vs. 55 (27.5%), respectively). While, the family members among cases from 4 to 6 children and more than 6 children were lower in cases compared to controls (81 (40.5%) vs. 99 (49.5%) for 4 to 6 children and 35 (17.5%) vs. 46 (23%) for more than 6 children, respectively).

4.1.7 Comparison between cases and controls regarding the economic level

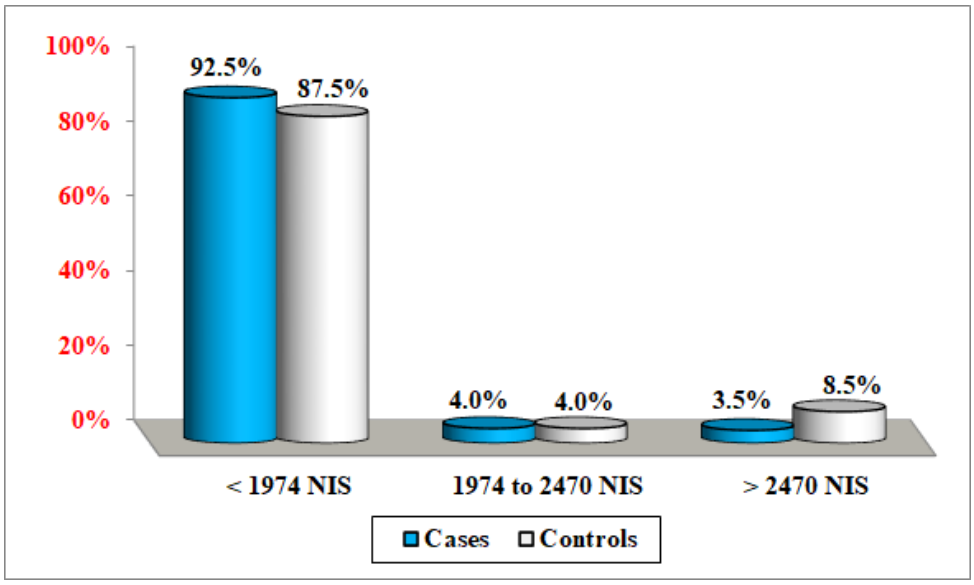

Figure (4.7): Comparison between cases and controls regarding the economic level of the family

Figure 4.7 illustrated the distribution of the participants regarding the economic level of the family. The results showed that the cases have the economic level of the family less than 1974 NIS higher than controls (185 (92.5%) vs. 175 (87.5%) respectively; while, the economic level from 1974 to 2470 NIS is equal in both cases and controls 8 (4%) vs. 8 (4%), respectively). The results showed that the economic level of more than 2470 NIS is lower among cases compared to controls (7 (3.5%) vs. 17 (8.5%), respectively%.

4.2 Inference analysis of the study variables

4.2.1 Relationship between sociodemographic characteristics and unplanned caesarean birth

Table (4.1): Socio-demographic characteristics of the participating mothers

Variables	Categories	Cases (n=200) N (%)	Controls (n=200) N (%)	Statistical Analysis		
				mOR	95% CI	P-value
Age (years)						
	Less than 20	22 (11)	7 (3.5)	4.17	(1.66-10.5)	**0.002***
	20 to 24 (Ref.)	52 (26)	69 (34.5)	1.0		
	25 to 30	66 (33)	66 (33)	1.33	(0.81-2.18)	0.264
	More than 30	60 (30)	58 (29)	1.37	(0.82-2.29)	0.223
Residency						
	Camp	30 (15)	34 (17)	0.9	0.51-1.59	0.717
	Village	74 (37)	68 (34)	1.11	0.72-1.71	0.634
	City (Ref.)	96 (48)	98 (49)	1.0		
Level of education						
	1 - 9	13 (6.5)	33 (16.5)	2.87	1.42-5.8	**0.003***
	10 - 12	91 (45.5)	82 (41)	1.02	0.67-1.54	0.934
	13 and more (Ref.)	96 (48)	85 (42.5)	1.0		
Current social statues						
	Separated	9 (4.5)	2 (1)	5.21	1.13-24.09	**0.035***
	Married (Ref.)	191 (95.5)	198 (99)	1.0		
Father career						
	Unemployed	118 (59)	82 (41)	2.07	1.39-3.08	**<0.001***
	Employed (Ref.)	82 (41)	118 (59)	1.0		
Mother career						
	Unemployed	192 (96)	181 (90.5)	2.07	1.39-3.08	**<0.001***
	Employed (Ref.)	8 (4)	19 (9.5)	1.0		
Family members						
	≤ 4 children (Ref.)	84 (42)	55 (27.5)	1.0		
	More than 6 children	81 (40.5)	99 (49.5)	2.01	1.15 - 3.5	**0.014***
	4-6 children	35 (17.5)	46 (23)	1.87	1.19 - 2.93	**0.006***
Economic level of the family (NIS)						
	Less than 1974	185 (92.5)	175 (87.5)	2.57	1.04 - 6.34	**0.041***
	1974 to 2470	8 (4)	8 (4)	2.43	0.65 - 9.07	0.187
	More than 2470 (Ref.)	7 (3.5)	17 (8.5)	1.0		

* P < 0.05: significant, P ≥ 0.05: not significant; **n:** number**; mOR**: matched odds ratio & **CI**: confidence interval.

4.2.1.1 Maternal Age

The demographic characteristics of the 400 eligible participants are shown in Table 4.1. The majority (33%) of mothers lies between the age group of 20-24 years. Paternal age is playing a significant role (p=0.002) about fourth-fold in the likelihood of unplanned caesarean birth at age less than 20 (OR: 4.17; 95% CI: 1.66, 10.5).

4.2.1.2 Parental Education

The distribution of the study population by maternal education showed that 33 (16.5%) of controls compared to 13 (6.5%) of cases have an educational level of 1-9 years of education. Conditional logistic regression analysis showed a significant association (p = 0.003) between maternal educational level and unplanned caesarean birth. The odds of unplanned caesarean birth were about 3-fold (mOR: 2.87; 95% CI: 1.42, 5.8) higher in lower-educated mothers (< 9 years) compared to those with the high educational level (≥ 13 years) (Table 4.1).

4.2.1.3 Current marital status

The distribution of the study population by current social status showed that 2 (1%) of controls compared to 9 (4.5%) of cases were separated. Conditional logistic regression analysis showed a significant association (p = 0.035) between social status and unplanned caesarean birth. The odds of unplanned caesarean birth were about 5-fold (mOR: 5.21; 95% CI: 1.13, 24.09) higher in separated mothers compared to those married (Table 4.1).

4.2.1.4 Parental careers

According to the distribution of the study population by fathers' career, 118 (59%) of controls and 82 (41%) of cases were unemployed. A significant (p 0.001) relationship between unemployed fathers and the occurrence of unplanned caesarean birth among mothers was revealed using conditional logistic regression analysis. When comparing unemployed husbands to controls, the odds of an unplanned caesarean birth were about 2-folds (mOR: 1.7; 95% CI: 1.39, 3.08). (Table 4.1). Furthermore, the distribution of the study population by mothers' occupation revealed that 181 (90.5%) of controls and 192 (96%) of cases have employees. A significant (p 0.001) relationship between unemployed mothers and unplanned caesarean birth was discovered using conditional logistic regression analysis. When compared to controls, unemployed mothers had a 1.5-fold (mOR: 1.6; 95% CI: 1.04, 2.43) higher risk of unplanned caesarean birth (Table 4.1).

4.2.1.5 Family members

According to the distribution of the study population by family members, 99 (49.5%) of the controls and 81 (40.5%) of the cases have family members with more than six children. In a conditional logistic regression analysis, a significant association (p = 0.014) was found between mothers who have family members with more than 6 children and unplanned caesarean birth among mothers. When compared to controls, the odds of an unplanned caesarean birth were about 2-fold (mOR: 2.01; 95% CI: 1.15, 3.5) higher among mothers with family members having more than 6 children (Table 4.1). Similarly, the distribution of the study population by family members revealed that 46 (23%) of controls and 35 (17.5%) of cases have family members ranging from 4–6 children. In conditional logistic regression analysis, a significant association (P = 0.006) was found between mothers who have family members with 4-6 children and unplanned caesarean birth among mothers. When compared to controls, the odds of unplanned caesarean birth among mothers were about 2-folds (mOR: 1.87; 95% CI: 1.19, 2.93) higher among mothers with family members who were 4–6 children's fathers (Table 4.1).

4.2.1.6 Economic level of the family

The distribution of the study population by economic level of the family showed that 175 (87.5%) of controls compared to 185 (92.5%) of cases have income less than 1974 NIS. Conditional logistic regression analysis showed a significant association (p = 0.014) between mothers who have income less than 1974 NIS and unplanned caesarean birth among mothers. The odds of unplanned caesarean birth among mothers were about 2.5-folds (mOR: 2.57; 95% CI: 1.04, 6.34) higher among mothers who have income less than 1974 NIS compared to controls (Table 4.1).

4.2.2 Univariate analysis of maternal and neonatal somatic characteristics and unplanned caesarean birth

Table (4.2): Maternal and neonatal somatic characteristics

Variables	Categories	Case (n=200) N (%)	Control (n=200) N (%)	Statistical Analysis		
				mOR	95% CI	P-value
Mother's BMI instantly before pregnancy						
	Normal weight (Ref.)	107 (53.5)	115 (57.5)	1.0		
	Underweight (<18)	6 (3)	9 (4.5)	0.72	0.25-2.08	0.540
	Overweight (25-29.9)	51 (25.5)	59 (29.5)	0.93	0.59-1.47	0.753
	Obese (>30)	36 (18)	17 (8.5)	2.28	1.21-4.29	0.011*
Mother's height (cm)						
	Less than 150	11 (5.5)	3 (1.5)	3.82	1.05-13.91	**0.042***
	150 and more than (Ref.)	189 (94.5)	197 (98.5)	1.0		
Average pregnancy weight gain kgs						
	11.5 to16	53 (26.5)	69 (34.5)	1.0		
	Less than 11.5	123 (61.5)	119 (59.5)	1.35	0.87-2.09	0.184
	More than 16	24 (12)	12 (6)	2.6	1.19-5.68	**0.016***
Mother's Hb. the level at delivery (mg/dl)						
	<11mg/dl (Anemia)	131 (65.5)	108 (54)	1.62	1.08-2.42	**0.019***
	≥11 mg/dl. (Ref.)	69 (34.5)	92 (46)	1.0		
Gestational age at delivery (wks.)						
	< 37wks.	55 (27.5)	9 (4.5)	8.66	4.13-18.13	**0.000***
	> 42 wks.	13 (6.5)	4 (2)	4.6	1.47-14.43	**0.009***
	37- 42 wks (Ref.)	132 (66)	187 (93.5)	1.0		
Neonatal weight at delivery (gms)						
	< 2500 gms	33 (16.5)	6 (3)	0.16	0.06-0.38	**0.000***
	≥ 2500 gms (Ref.)	167 (83.5)	194 (97)	1.0		

* P < 0.05: significant, P ≥ 0.05: not significant; **n:** number**; mOR**: matched odds ratio & **CI**: confidence interval.

4.2.2.1 Mother's BMI instantly before pregnancy and unplanned caesarean birth

The distribution of the study population by mother's BMI instantly before pregnancy showed that 17 (8.5%) of controls compared to 36 (18%) of cases were obese. Conditional logistic regression analysis showed a significant association (p = 0.011) between mothers' obesity and unplanned caesarean birth among mothers. The odds of unplanned caesarean birth among obese mothers were about 2-fold (mOR: 2.28; 95% CI: 1.21, 4.29) higher than controls (Table 4.2).

4.2.2.2 Mother's height and unplanned caesarean birth

The distribution of the study population by moth mother's height (cm) 3 (1.5%) of controls compared to 11 (5.5%) of cases were obese. Conditional logistic regression analysis showed a significant association between mothers who have the highest less than 150 cm and unplanned caesarean birth among mothers (p = 0.042). The odds of unplanned caesarean birth among mothers were about 3-fold (mOR: 3.82; 95% CI: 1.05, 13.91) higher among obese compared to controls (Table 4.2).

4.2.2.3 Average pregnancy weight gain and unplanned caesarean birth

The distribution of the study population by average pregnancy weight gain per kg showed that 12 (6%) of controls compared to 24 (12%) of cases have an average pregnancy weight gain of more than 16 kgs. Conditional logistic regression analysis showed a significant association between mothers having an average pregnancy weight gain of more than 16 kgs and unplanned caesarean birth among mothers (p = 0.016). The odds of unplanned caesarean birth among mothers were about 2.5-fold (mOR: 2.6; 95% CI: 1.19, 5.68) higher among mothers who have an average pregnancy weight gain of more than 16 kgs compared to the control group (Table 4.2).

4.2.2.4 Mother's hemoglobin (Hb) level at delivery and unplanned caesarean birth

The distribution of the study population by maternal Hb. the level at delivery showed that 108 (54%) of controls compared to 131 (65.5%) of cases were have anemia (less than 11 g/dl) at delivery. Conditional logistic regression analysis showed a significant association between mothers have mothers having Hb. the level at delivery less than 11 g/dl (Anemia) and unplanned caesarean birth among mothers ((p = 0.019). The odds of unplanned caesarean birth among mothers were about 1.5-fold (mOR: 1.62; 95% CI: 1.08, 2.42) higher

among mothers who have Hb. the level at delivery is less than 11 mg/dl (Anemia) compared to controls (Table 4.2).

4.2.2.5 Gestational age at delivery and unplanned caesarean birth

The distribution of the study population by gestational age at delivery 9 (4.5%) of controls compared to 55 (27.5%) of cases were gestational age at delivery less than 37 wks. Conditional logistic regression analysis showed a significant association between mothers having a mother gestational age at delivery of fewer than 37 weeks and unplanned caesarean birth ($p < 0.001$). The odds of unplanned caesarean birth among mothers were about 9-fold (mOR: 8.66; 95% CI: 4.13, 18.13) higher among mothers who have a Gestational age at delivery less than 37 wks compared to controls. Also, Conditional logistic regression analysis showed a significant association between mothers having a mother gestational age at delivery of more than 37 wks and unplanned caesarean birth ($p = 0.009$). The odds of unplanned caesarean birth among mothers were about 5-fold (mOR: 4.60; 95% CI: 1.47, 14.43) higher among mothers who have a gestational age at delivery less than 37 wks compared to controls (Table 4.2).

4.2.2.6 Neonatal weight at delivery and unplanned caesarean birth

Table 4.2 showed that the distribution of the study population by neonatal weight at delivery was less than 2500 gms in 194 (97) controls compared to 167 (83.5) cases where neonatal weight at delivery was less than 2500 gms. Conditional logistic regression analysis showed a reverse significant association between mothers having neonatal weight at delivery less than 2500 gms and unplanned caesarean birth. The odds of unplanned caesarean birth among mothers were about 0.16-fold (mOR: 0.16; 95% CI: 0.06, 0.38) lower among mothers who have neonatal weight at delivery less than 2500 gms compared to controls ($p < 0.001$).

4.2.3 Multivariate Results of Maternal and Neonatal Somatic Characteristics

Table (4.3): Adjusted mOR of maternal and neonatal somatic characteristics

Variables	Categories	Model 1 [a]			Model 2 [b]		
		mOR	95% CI	P-value	mOR	95% CI	P-value
Mother's BMI instantly before pregnancy.							
	Normal weight (Ref.)	1.0			1.0		
	Underweight (<18)	2.32	(1.16-4.64)	**0.017***	2.28	(1.21-4.29)	**0.011***
	Overweight (25-29.9)	5.65	(1.35-23.59)	**0.018***	3.18	(0.97-10.37)	0.056
	Obese (>30)	2.42	(1.16-5.07)	**0.019***	2.45	(1.23-4.87)	**0.011***
Mother's height (cm)							
	Less than 150	3.09	(0.79-12.17)	0.106	3.47	(0.89-13.48)	0.073
	150 and more than (Ref.)	1.0			1.0		
Average pregnancy weight gain kgs							
	11.5 to16 (Ref.)	1.0			1.0		
	Less than 11.5	2.73	(1.21-6.19)	**0.016***	2.87	(1.27-6.46)	**0.011***
	More than 16	2.53	(1.17-5.48)	**0.019***	2.50	(1.15-5.4)	0.020*
Mother's Hb. the level at delivery (mg/dl)							
	<11mg/dl (Anemia)	1.75	(1.13-2.72)	**0.013***	1.67	(1.1-2.55)	**0.017***
	≥11 mg/dl. (normal) (Ref.)	1.0			1.0		
Gestational age at delivery (wks).							
	< 37wks.	6.65	(2.05-21.58)	**0.002***	4.31	(1.29-14.39)	**0.018***
	> 42 wks	0.99	(0.25-3.87)	0.986	0.54	(0.13-2.18)	0.388
	37- 42 wks (Ref.)	1.0			1.0		
Neonatal weight at delivery (gms)							
	< 2500 gms	0.15	(0.02-0.61)	**0.003***	0.63	(0.15-.82)	**0.000***
	≥ 2500 gms (Ref.)	1.0					

mOR: matched odds ratio; **CI**: confidence interval. [a] adjusted for all significant variables of maternal and neonatal somatic characteristics atunivariate p-value <0.20. [b] adjusted for demographic characteristics (Age, level of education, current social statues, husband's career, mother's career, family members, and economic level of the family).

Multivariate conditional logistic regression was used to emphasize the earlier-mentioned results from univariate analysis. Using stepwise backward selection, the AOR for unplanned caesarean birth was calculated. Five factors were found to be independently significant predictors for increasing the likelihood of unplanned caesarean birth, namely mothers' exposure to ascending amounts of Obese, Average pregnancy weight less than 11 .5 kg and more than 16 kgs, and mother's Hb. the level at delivery, gestational age at delivery and neonatal weight at delivery (Table 4.3, Model I).

Further analysis was performed to see whether the previously described explanatory variables (model 1 results) remained statistically significant predictors of unplanned caesarean birth after controlling for potential confounders. The findings indicate that a mother's abnormal BMI before pregnancy is a risk factor for unplanned caesarean birth. Specifically, women with an increased or decreased BMI before pregnancy were at a higher risk for unplanned caesarean birth than normal delivery. Furthermore, average pregnancy weight gains of less than 11.5 kg (mOR:2.73; p = 0.016), more than 16 kgs (mOR:2.53: 95% CI: (1.17-5.48); p = 0.019), mother's Hb. the level at delivery less than 11mg/dl (mOR:1.75: p = 0.013), and gestational age less than 37 wks. (mOR:6.65: p = 0.002) were statistically significant predictors of unplanned caesarean birth at model 1. In contrast, a protective factor of unplanned caesarean birth is a neonatal weight at birth less than 2500 gm (mOR: 0.15, p = 0.003). The findings clearly reveal that maternal height is not statistically associated with unplanned caesarean birth (mOR: 3.09, p = 0.106), instead of an elevated ORs

However, analysis was carried out to identify if the pre-mentioned five explanatory variables (results of model 2), remained statistically significant predictors for unplanned caesarean birth after adjustment for possible confounders. The final results show that a mother’s abnormal BMI before pregnancy is an independent risk factor for unplanned caesarean birth. Moreover, average pregnancy weight gain of fewer than 11.5 kgs (mOR: 2.87: 95% CI:(1.27-6.46); p = 0.011), average pregnancy weight gain of more than 16 kgs (mOR:2.5; p = 0.020), mother’s Hb level at delivery less than 11 g/dl (mOR: 1.67; p = 0.025), gestational age at delivery less than 37 wks. (mOR: 4.31; p = 0.017), gestational age at delivery more than 42 wks. (mOR: 0.54; p < 0.00) remained statistically related to unplanned caesarean birth at model 2. Table 4.3 also showed that maternal height and gestational age at delivery of more than 42 wks were not statistically associated with unplanned caesarean birth in model 2.

4.2.4 Univariate analysis of previous obstetrical history and unplanned caesarean birth

Table (4.4): Previous obstetrical history

Variables	Categories	Cases (n=200) N (%)	Controls (n=200) N (%)	Statistical Analysis		
				mOR	95% CI	P-value
Current diagnosis						
PROM	Yes	26 (13)	19 (9.5)	1.42	0.76-2.66	0.270
	No (Ref.)	174 (87)	181 (90.5)	1.0		
Oligohydramnios	Yes	8 (4)	1 (0.5)	8.29	1.03-66.92	**0.047***
	No (Ref.)	192 (96)	199 (99.5)	1.0		
APH	Yes	9 (4.5)	1 (0.5)	8.29	1.03-66.92	**0.047***
	No (Ref.)	191 (95.5)	199 (99.5)	1.0		
Bad CTG	Yes	85 (42.5)	7 (3.5)	20.38	9.12-45.56	**0.000***
	No (Ref.)	115 (57.5)	193 (96.5)	1.0		
Chorioamnionitis	Yes	7 (3.5)	2 (1)	3.59	0.74-17.5	0.114
	No (Ref.)	193 (96.5)	198 (99)	1.0		
Preeclampsia	Yes	3 (1.5)	1 (0.5)	3.03	0.31-29.38	0.339
	No (Ref.)	197 (98.5)	199 (99.5)	1.0		
Breech position	Yes	12 (6)	1 (0.5)	12.7	1.64-98.64	**0.015***
	No (Ref.)	188 (94)	199 (99.5)	1.0		
obstructed labour	Yes	12 (6)	2 (1)	6.32	1.4-28.61	**0.017***
	No (Ref.)	188 (94)	198 (99)	1.0		
Polyhydramnios	Yes	5 (2.5)	2 (1)	2.54	0.49-13.24	0.269
	No (Ref.)	195 (97.5)	198 (99)	1.0		
Placenta Previa	Yes	4 (2)	1 (0.5)	4.06	0.45-36.66	0.212
	No (Ref.)	196 (98)	199 (99.5)	1.0		
Multiple pregnancy						
	Twins (2 or more)	10 (5)	2 (1)	5.21	1.13-24.09	**0.035***
	One (Ref.)	190 (95)	198 (99)	1.0		
Gravida						
	Primigravida	76 (38)	44 (22)	2.21	1.37-3.55	**0.001***
	2-4 times (Ref.)	79 (39.5)	101 (50.5)	1.0		
	5 times or more	45 (22.5)	55 (27.5)	1.05	0.64-1.71	0.858
Para						
	Prime	81 (40.5)	51 (25.5)	2.04	1.28-3.24	**0.003***
	2 - 4 times (Ref.)	74 (37)	95 (47.5)	1.0		
	5 times or more	45 (22.5)	54 (27)	1.07	0.65-1.76	0.791
Spacing between last pregnancy and the previous delivery (year/s)						
	Less than 2	103 (86.6)	95 (63.8)	5.29	2.35-11.88	**0.000***
	1-2 (Ref.)	8 (6.7)	39 (26.2)	**1.0**		
	More than 3 years	8 (6.7)	15 (10.1)	2.6	0.83-8.18	0.102
Did you have previous unplanned caesarean birth?						
	Yes	36 (30.3)	10 (6.7)	6.03	2.84-12.78	**0.000***
	No (Ref.)	83 (69.7)	139 (93.3)	1.0		
What is the fetal presenting part at delivery?						
	Cephalic (Ref.)	178 (89)	198 (99)	1.0		
	Shoulder/Breach	22 (11)	2 (1)	12.24	2.84-52.77	**0.001***
Did you safely transfer to the hospital						
	Yes	198 (99)	199 (99.5)	0.50	0.04-5.53	0.570
	No (Ref.)	2 (1)	1 (0.5)	1.0		

P < 0.05: significant, P ≥ 0.05: not significant; **n:** number**; mOR**: matched odds ratio & **CI**: confidence interval.

4.2.4.1 Current diagnosis

4.2.4.1.1 Premature rupture of membrane (PROM)

Table 4.4 showed that the previous obstetrical history. The distribution of the study population by PROM 19 (9.5%) of controls compared to 26 (13%) of cases. Conditional logistic regression analysis showed no significant association between Current diagnosis by PROM and unplanned caesarean birth among mothers ($p = 0.270$). The odds of unplanned caesarean birth among mothers with current diagnosis by PROM are about 1.5-fold (mOR: 1.42; 95% CI: 0.76, 2.66) unplanned caesarean birth compared to controls.

4.2.4.1.2 Oligohydramnios

The distribution of the study population by Oligohydramnios 1 (0.5%) of controls compared to 8 (4%) of cases. Conditional logistic regression analysis showed a significant association between Current diagnosis by Oligohydramnios and unplanned caesarean birth among mothers ($p = 0.047$). The odds of unplanned caesarean birth among mothers related to current diagnosis by oligohydramnios was about 8- fold (mOR: 8.29; 95% CI: 1.03, 6.92) unplanned caesarean birth compared to controls (Table 4.4).

4.2.4.1.3 Bad CTG

The distribution of the study population by bad CTG 7 (3.5%) of controls compared to 85 (42.5%) of cases. Conditional logistic regression analysis showed that there is a significant association between Current diagnosis by bad CTG and unplanned caesarean birth among mothers ($p < 0.001$). The odds of unplanned caesarean birth among mothers related to current diagnosis by bad CTG was about 20- fold (mOR: 20.38; 95% CI: 9.12, 5.56) unplanned caesarean birth compared to controls (Table 4.4).

4.2.4.1.4 Chorioamnionitis

The distribution of the study population by chorioamnionitis 2 (1%) of controls compared to 7 (3.5%) of cases. Conditional logistic regression analysis showed that there is no significant association between current diagnosis by chorioamnionitis and unplanned caesarean birth among mothers ($p = 0.114$). The odds of unplanned caesarean birth among mothers' current diagnosis of chorioamnionitis is about 4 - fold (mOR: 3.59; 95% CI: 0.74, 17.5) unplanned caesarean birth compared to controls (Table 4.4).

4.2.4.1.5 Preeclampsia

The distribution of the study population by preeclampsia 1 (0.5%) of controls compared to 3 (1.5%) of cases. Conditional logistic regression analysis showed that there is no significant association between current diagnosis by preeclampsia and unplanned caesarean birth among mothers (p = 0.339). The odds of unplanned caesarean birth among mothers related to current diagnosis by preeclampsia bout 3- fold (mOR: 3.03; 95% CI: 0.31, 9.38) unplanned caesarean birth compared to controls (Table 4.4).

4.2.4.1.6 Breech position

The distribution of the study population by breech position 1 (0.5%) of controls compared to 3 (1.5%) of cases. Conditional logistic regression analysis showed that there is no significant association between the current diagnosis by Breech position and unplanned caesarean birth among mothers (p = 0.339). The odds of unplanned caesarean birth among mothers related to current diagnosis by breech position bout 3.0 - fold (mOR: 3.03; 95% CI: 0.31, 9.38) unplanned caesarean birth compared to controls (Table 4.4).

4.2.4.1.7 Obstructed labor

The distribution of the study population by obstructed labor 2 (1%) of controls compared to 12 (6%) of cases. Conditional logistic regression analysis showed that there is a significant association between Current diagnosis by obstructed labor and unplanned caesarean birth among mothers (p = 0.017).

The odds of unplanned caesarean birth among mothers had currently diagnosis by obstructed labor was about 6.0- fold (mOR: 6.32; 95% CI: 1.4-, 8.61) unplanned caesarean birth compared to controls (Table 4.4).

4.2.4.1.8 Polyhydramnios

The distribution of the study population by polyhydramnios 2 (1%) of controls compared to 5 (2.5%) of cases. Conditional logistic regression analysis showed that there is no significant association between current diagnosis by polyhydramnios and unplanned caesarean birth among mothers (p = 0.269). The odds of unplanned caesarean birth among mothers' current diagnosis by polyhydramnios was about 3.0- fold (mOR: 2.54; 95% CI: 0.49, 3.24) unplanned caesarean birth compared to controls (Table 4.4).

4.2.4.1.9 Placenta Previa

The distribution of the study population by placenta previa 1 (0.5%) of controls compared to 4 (2%) of cases. Conditional logistic regression analysis showed that there is no significant association between Current diagnosis by Placenta Previa and unplanned caesarean birth among mothers (p = 0.212). The odds of unplanned caesarean birth among mothers with current diagnosis by placenta previa was about 4- fold (mOR: 4.06; 95% CI: 0.45, 6.66) unplanned caesarean birth compared to controls (Table 4.4).

4.2.4.2 Multiple pregnancy

The distribution of the study population by multiple pregnant (more than one fetus) is 2 (1%) of controls compared to 10 (5%) of cases. Conditional logistic regression analysis showed that there is a significant association (mOR: 5.2, p = 0.035) between current diagnosis by multiple pregnancy and unplanned caesarean birth among mothers (Table 4.4).

4.2.4.3 Gravida

The distribution of the study population by Primigravida 44 (22%) of controls compared to 76 (38%) of cases. Conditional logistic regression analysis showed that there is a significant association between Current diagnosis by Primigravida and unplanned caesarean birth among mothers (p = 0.001). The odds of unplanned caesarean birth among mothers Primigravida bout 2.0 - fold (mOR: 2.21; 95% CI: 1.37, 3.55) unplanned caesarean birth compared to controls (Table 4.4). In contrast, the distribution of the study population by 5 times or more Gravida 55 (27.5%) of controls compared to 45 (22.5%) of cases. Conditional logistic regression analysis showed that there is no significant association between Current diagnosis by 5 times or more gravida and unplanned caesarean birth among mothers (p = 0.858). The odds of unplanned caesarean birth related to mothers with current diagnosis by 5 times or more gravida was about 1- fold (mOR: 1.05; 95% CI: 0.64, 1.71) unplanned caesarean birth compared to controls (Table 4.4).

4.2.4.4 Para

The distribution of the study population by prime 51 (25.5%) of controls compared to 81 (40.5%) of cases. Conditional logistic regression analysis showed that there is a significant association between maternal current diagnosis by prime and unplanned caesarean birth among mothers (p = 0.003). The odds of unplanned caesarean birth among mothers with

current diagnosis by prime about 2.04 - fold (mOR: 2.04; 95% CI: 1.28, 3.24) unplanned caesarean birth compared to controls (Table 4.4). In constant, the distribution of the study population by 5 times or more para 54 (27%) of controls compared to 45 (22.5%) of cases. Conditional logistic regression analysis showed that there is no significant association between 5 times or more para and unplanned caesarean birth among mothers (p = 0.791). The odds of unplanned caesarean birth among mothers with Current diagnosis by 5 times or more para about 1.07 - fold (mOR: 1.07; 95% CI: 0.65, 1.76) unplanned caesarean birth compared to controls (Table 4.4).

4.2.4.5 Spacing among last pregnancy and current delivery

The distribution of the study population by the spacing of less than 2 years between the last pregnancy and the previous one was 95 (63.8%) of controls compared to 103 (86.6%) of cases. Conditional logistic regression analysis showed that there is a significant association between the duration between the last pregnancy and the previous less than 2 years and unplanned caesarean birth among mothers (p < 0.0001). The odds of unplanned caesarean birth among mothers' duration between the last pregnancy and the previous less than 2 years was about 5.0 - fold (mOR: 5.29; 95% CI: 2.35, 1.88) unplanned caesarean birth compared to controls (Table 4.4). In contrast, the spacing of 3 years or more between the last pregnancy and the previous delivery one was 15 (10.1%) of controls compared to 8 (6.7%) of cases. Conditional logistic regression analysis showed that there is no significant association between the duration between the last pregnancy and the previous delivery 5 years or more and unplanned caesarean birth among mothers (p = 0.102). The odds of unplanned caesarean birth among mothers related to spacing between last pregnancy and the previous delivery 3 years or more was about 2.6- fold (mOR: 2.60; 95% CI: 0.83, 8.18) unplanned caesarean birth compared to controls (Table 4.4).

4.2.4.6 Previous one unplanned caesarean birth

The distribution of the study population showed that10 (6.7%) of controls compared to 36 (30.3%) of cases were have one previous unplanned caesarean birth. Conditional logistic regression analysis showed that there was a significant association (mOR: 6.03; p < 0.001) between the current diagnosis by the previous one caesarean birth and the occurrence of a second unplanned caesarean birth among mothers (Table 4.4).

4.2.4.7 The fetal presenting part at delivery

The distribution of the study population showed that 2 (1.0%) of controls compared to 22 (11.0%) of cases were have mal-presentation at the last delivery. Conditional logistic regression analysis showed that there was a significant association (p = 0.001) between the current diagnosis by mal-presentation of the fetus at delivery and unplanned caesarean birth (Table 4.4).

4.2.4.8 Safely transfer to the hospital

The distribution of the study population by safe transfer to the hospital was 199 (99.5%) controls compared to 198 (99%) cases. Conditional logistic regression analysis showed that there is no significant association between safe transfer to the hospital and unplanned caesarean birth among mothers (p = 0.57). The odds of unplanned caesarean birth among mothers who safely transferred to the hospital was about 0.5 - fold (mOR: 0.5; 95% CI: 0.04, 5.53) unplanned caesarean birth compared to controls (Table 4.4).

4.2.5 Multivariate Results of previous obstetrical history

Table (4.5): Adjusted OR of previous obstetrical history

Variables	Categories	Model 1 [a]			Model 2 [b]		
		mOR	95% CI	P-value	mOR	95% CI	P-value
Current diagnosis							
Oligohydramnios	Yes	9.66	(0.95-98.27)	0.055	9.98	1.18-84.13	0.035*
	No (Ref.)	1.0			1.0		
APH	Yes	10.38	(0.94-114.01)	0.056	9.35	1.12-77.78	0.039*
	No (Ref.)	1.0			1.0		
Bad CTG	Yes	38.91	(12.63-119.89)	0.000*	20.46	9.03-46.33	0.000*
	No (Ref.)	1.0			1.0		
Breech position	Yes	6.41	(1.11-36.98)	0.038*	13.15	1.67-103.82	0.015*
	No (Ref.)	1.0			1.0		
Obstructed labor	Yes	11.3	(0.97-130.0)	0.054	0.69	0.2-2.42	0.566
	No (Ref.)	1.0			1.0		
Multiple pregnancy	Twins (2 or more)	11.25	(0.97-130.28)	0.053	5.74	1.2-27.38	0.028*
	One (Ref.)	1.0			1.0		
Gravida	Primigravida	1.5	(1.00-5.00)	0.520	0.93	0.5-1.71	0.815
	2-4 times (Ref.)	1.0			1.0		
	5 times or more	1.25	0.64-1.71	0.666	0.47	0.25-0.88	0.018*
Para	Prime	2.04	1.28-3.24	0.003*	0.93	0.5-1.71	0.815
	2 to 4 times (Ref.)	1.0			1.0		
	5 times or more	0.76	(0.21-2.72)	0.673	0.47	0.25-0.88	0.018*
Spacing between last pregnancy and the previous delivery (year/s)							
	Less than 2	6.23	3.75-12.09	0.000*	2.78	0.78-9.88	0.115
	1-2 (Ref.)	1.0			1.0		
	More than 3 years	2.9	0.81-7.07	0.093	0.40	0.15-1.06	0.065

Table (4.5): Continued

Did you have previous unplanned caesarean birth?							
	Yes	7.33	(2.96-18.17)	0.000*	5.79	2.68-12.54	0.000*
	No (Ref.)	1.0			1.0		
What is the fetal presenting part at delivery?							
	Cephalic (Ref.)	1.0			1.0		
	Shoulder/Breach	29.79	(2.95-300.77)	0.004*	11.75	2.68-51.52	0.001*
Did you safely transfer to the hospital?							
	Yes	0.12	(0-76007.26)	0.755	0.79	0.07-8.93	0.846
	No (Ref.)	1.0			1.0		

*** mOR**: matched odds ratio; **CI**: confidence interval. **[a]** adjusted for all significant variables of previous obstetrical history at univariate p value <0.20. **[b]** adjusted for demographic characteristics (Age, level of education, current social statues, husband career, mother career, family members and economic level of the family).

Multivariate conditional logistic regression was used to emphasize the earlier-mentioned results from univariate analysis. Using stepwise backward selection, the AOR for unplanned caesarean birth was calculated. Six factors were found to be independently significant predictors for increasing the likelihood of unplanned caesarean birth, namely mothers' exposure to bad CTG, Breech position, Prime, pregnancy, and the previous delivery less than 2 years, the fetal presenting part at delivery is Shoulder/Breach, safely transfer to the hospital (Table 4.5, Model I).

Further analysis was carried out to identify if the pre-mentioned explanatory variables (results of model 1), remained statistically significant predictors for unplanned caesarean birth after adjustment for possible confounders. The final results show that mothers have a current diagnosis by bad CTG (mOR: 38.91: 95% CI: (12.63-119.89); $p < 0.001$), Breech position (mOR: 6.41: 95% CI: (1.11-36.98); $p = 0.038$), prime (mOR: 2.04: 95% CI: 1.28-3.24; $p = 0.003$), Duration between last pregnancy and the previous delivery less than 2 years (mOR: 6.23: 95% CI: 3.75-12.09; $p = 0.000$), previous unplanned caesarean birth (mOR: 7.33: 95% CI: (2.96-18.17); $p = 0.000$), Shoulder/Breach in the fetal position in the last month of pregnancy (mOR: 29.79: 95% CI: (2.95-300.77); $p = 0.004$) in higher risk for unplanned caesarean birth than normal delivery. While results show that mothers have a current diagnosis by of oligohydramnios (mOR: 9.66; $p = 0.055$), antepartum hemorrhage (APH) (mOR: 10.38; $p = 0.056$), obstructed labor (mOR: 11.30; $p = 0.054$), multiple pregnancy (2 twins or more) (mOR: 11.25: 95% CI: (0.97-130.28); $p = 0.053$), Gravida (mOR: 1.5: 95% CI: (1.00-5.00); $p = 0.52$), (mOR: 1.25: 95% CI: 0.64-1.71; $p = 0.666$), (mOR: 2.9: 95% CI: 0.81-7.07; $p = 0.093$), Did you have previous unplanned caesarean birth?, Did you safely transfer to the hospital? (mOR: 0.12: 95% CI: (0-76007.26); $p = 0.755$), (mOR: 0.76: 95% CI: (0.21-2.72); $p = 0.673$) are not associated with risk for unplanned caesarean birth than normal delivery.

However, analysis was carried out to identify if the pre-mentioned five explanatory variables (results of model 2), remained statistically significant predictors for unplanned caesarean birth after adjustment for possible confounders. The final results of Model 2 show that mothers had a current diagnosis by bad CTG (mOR: 20.46: 95% CI: (9.03-46.33); p = 0.000), breech position (mOR: 13.15: 95% CI: (1.67-103.82); p = 0.015), multiple pregnancy (mOR: 5.74: 95% CI: (1.2-27.38); p = 0.028), 5 times gravida or more (mOR: 0.47: 95% CI: (0.25-0.88); p = 0.018), 5 times para or more (mOR: 0.47: 95% CI: (0.25-0.88); p = 0.018), oligohydramnios (mOR: 9.98: 95% CI: (1.18-84.13); p = 0.035), APH (mOR: 9.35: 95% CI: (1.12-77.78); p = 0.039), breach fetal position (mOR: 13.15; p = 0.015) in higher risk for unplanned caesarean birth than normal delivery. In contrast, the results show that no associated unplanned caesarean birth among mothers have a current diagnosis by obstructed labor (p = 0.566), primigravida (p = 0.815), prime para (p = 0.815), spacing [more than 3 years (p = 0.065) and less than 2 years (p = 0.115)], and safely transfer to the hospital (p = 0.846).

4.2.6 Univariate analysis of ANC and unplanned caesarean birth

Table (4.6): ANC visits

Variables	Categories	Cases (n=200) N (%)	Controls (n=200) N (%)	Statistical Analysis		
				mOR	95% CI	P-value
Where did you follow up in the last pregnancy?						
	UNRWA clinic (Ref.)	107 (53.5)	83 (41.5)	1.0		
	Governmental clinic	28 (14)	47 (23.5)	0.46	0.27-0.8	**0.006***
	Non-governmental clinic	65 (32.5)	70 (35)	0.72	0.46-1.12	0.147
When did you start visiting ANC clinic during current pregnancy?						
	1st trimester (Ref.)	148 (74)	134 (67)	1.0		
	2nd trimester	41 (20.5)	60 (30)	0.62	0.39-0.98	**0.041***
	3rd trimester	11 (5.5)	6 (3)	1.66	0.6-4.61	0.331
Did you complain of recurrent vaginal bleeding during last pregnancy?						
	Yes	1 (0.5)	1 (0.5)	1.00	0.06-16.1	1.000
	No (Ref.)	199 (99.5)	199 (99.5)	1.0		
Have you a history of chronic medical problems such as HTN or DM?						
	Yes	5 (2.5)	7 (3.5)	0.71	0.22-2.27	0.560
	No (Ref.)	195 (97.5)	193 (96.5)	1.0		
Have you had any health problem/s related to your last pregnancy? e.g., preeclampsia						
	Yes	6 (3)	2 (1)	3.06	0.61-15.36	0.174
	No (Ref.)	194 (97)	198 (99)	1.0		
What was the fetal position in the last month of pregnancy?						
	Cephalic (Ref.)	179 (89.5)	198 (99)	1.0		
	Breach/ Transverse	21 (10.5)	2 (1)	11.61	2.69-50.23	**0.001***

Table (4.5): Continued

Before pregnancy, did you discuss the pregnancy issue with their husband?						
	Yes, with an agreement (Ref.)	112 (56)	131 (65.5)	1.0		
	No	87 (43.5)	65 (32.5)	1.57	1.04-2.36	**0.032***
	Yes, with disagreement	1 (0.5)	4 (2)	0.29	0.03-2.65	0.275
Before pregnancy, did you have the desire to get pregnant?						
	Yes (Ref.)	177 (88.5)	167 (83.5)	1.0		
	No	17 (8.5)	20 (10)	0.80	0.41-1.58	0.525
	I don't know	6 (3)	13 (6.5)	0.44	0.16-1.17	0.100
Did you take any steps to terminate the pregnancy?						
	Yes	3 (13)	1 (3)	4.8	0.47-49.39	0.187
	No (Ref.)	20 (87)	32 (97)	1.0		

*P < 0.05: significant, P ≥ 0.05: not significant; **n:** number**; mOR**: matched odds ratio & **CI**: confidence interval.

4.2.6.1 Follow up during the last pregnancy

The distribution of the study population by Follow up in the last pregnancy in the Governmental clinic was 47 (23.5%) controls compared to 28 (14%) cases. Conditional logistic regression analysis showed that there is a significant association between follow-up in the last pregnancy in the governmental clinic and unplanned caesarean birth among mothers (p = 0.006). The odds of unplanned caesarean birth among mothers following up on the last pregnancy in governmental clinics are about 0.5 - fold (mOR: 0.46; 95% CI: 0.27, 0.80) unplanned caesarean birth compared to controls (Table 4.6). In contrast, the distribution of the study population by follow-up in the last pregnancy in governmental clinics was 70 (35%) of controls compared to 65 (32.5%) of cases. Conditional logistic regression analysis showed that there is no significant association between follow-up in the last pregnancy in the non-governmental clinic and unplanned caesarean birth among mothers (p = 0.147). The odds of unplanned caesarean birth among mothers following up on the last pregnancy in Governmental clinics are about 0.72 - fold (mOR: 0.72; 95% CI: 0.46, 1.12) unplanned caesarean birth compared to controls (Table 4.6).

4.2.6.2 Start visiting the ANC clinic during the current pregnancy

The distribution of the study population by start visiting the ANC clinic during the current pregnancy in 2nd trimester was 60 (30%) of controls compared to 41 (20.5%) of cases. Conditional logistic regression analysis showed that there is a significant association between starting to visit an ANC clinic during the current pregnancy in 2nd trimester and unplanned caesarean birth among mothers (p = 0.041). The odds of unplanned caesarean

birth among mothers by start visiting the ANC clinic during the current pregnancy in 2nd trimester are about 0.5 - fold (mOR: 0.62; 95% CI: 0.39, 0.98) unplanned caesarean birth compared to controls (Table 4.6). In contrast, start visiting the ANC clinic during 2nd trimester The distribution of the study population by start visiting the ANC clinic during the current pregnancy in 2nd trimester 6 (3%) of controls compared to 11 (5.5%) of cases. Conditional logistic regression analysis showed that there is no significant association between starting to visit an ANC clinic during the current pregnancy in 2nd trimester and unplanned caesarean birth among mothers (p = 0.331). The odds of unplanned caesarean birth among mothers who started visiting ANC clinics during the current pregnancy in 2nd trimester were about 2 - fold (mOR: 1.66; 95% CI: 0.6-, 4.61) unplanned caesarean birth compared to controls (Table 4.6).

4.2.6.3 Complain of recurrent vaginal bleeding during last pregnancy

The distribution of the study population by complain of recurrent vaginal bleeding during the last pregnancy was 1 (0.5%) of controls compared to 1 (0.5%) of cases. Conditional logistic regression analysis showed that there is no significant association between complain of recurrent vaginal bleeding during the last pregnancy and unplanned caesarean birth among mothers (p = 1.000). The odds of unplanned caesarean birth among mothers who complained of recurrent vaginal bleeding during the last pregnancy were about 1.0 - fold (mOR: 1; 95% CI: 0.06, 16.1) unplanned caesarean birth compared to controls (Table 4.6).

4.2.6.4 History of chronic medical problems such as HTN or DM

The distribution of the study population by the history of chronic medical problems such as HTN or DM was 7 (3.5%) controls compared to 5 (2.5%) cases. Conditional logistic regression analysis showed that there was no significant association between a history of chronic medical problems such as HTN or DM and unplanned caesarean birth among mothers (p = 0.560). The odds of unplanned caesarean birth among mothers who had a history of chronic medical problems such as HTN or DM were about 1.0 - fold (mOR: 0.71; 95% CI: 0.22, 2.27) unplanned caesarean birth compared to controls (Table 4.6).

4.2.6.5 Had any health problem/s related to their last pregnancy

The distribution of the study population by had any health problem/s related to their last pregnancy e.g., preeclampsia 2 (1) of controls compared to 6 (3) of cases. Conditional

logistic regression analysis showed that there is no significant association between mothers had any health problem/s related to their last pregnancy e.g., preeclampsia and unplanned caesarean birth among mothers (p = 0.174). The odds of unplanned caesarean birth among mothers who had any health problem/s related to their last pregnancy e.g., preeclampsia about 3.0 - fold (mOR: 3.06; 95% CI: 0.61, 5.36) unplanned caesarean birth compared to controls (Table 4.6).

4.2.6.6 Breach/ Transverse as the fetal position in the last month of pregnancy

The distribution of the study population by Breach/ Transverse as the fetal position in the last month of pregnancy 2 (1%) of controls compared to 21 (10.5%) of cases. Conditional logistic regression analysis showed that there is a significant association between Breach/ Transverse as the fetal position in the last month of pregnancy and unplanned caesarean birth among mothers (p = 0.001). The odds of unplanned caesarean birth among mothers at Breach/ Transverse as the fetal position in the last month of pregnancy was about 12.0 - fold (mOR: 11.61; 95% CI: 2.69, 0.23) unplanned caesarean birth compared to controls (Table 4.6).

4.2.6.7 Discuss the pregnancy issue with their husband

The distribution of the study population not discussing the pregnancy issue with their husband was 65 (32.5%) of controls compared to 87 (43.5%) of cases. Conditional logistic regression analysis showed that there is a significant association between not discussing the pregnancy issue with their husband and unplanned caesarean birth among mothers (p = 0.032). The odds of unplanned caesarean birth among mothers hadn't discussed the pregnancy issue with their husbands? about 2 - fold (mOR: 1.57; 95% CI: 1.04, 2.36) unplanned caesarean birth compared to controls (Table 4.6). In contrast, discussing the pregnancy issue with their husband with disagreeing was 4 (2%) of controls compared to 1 (0.5%) of cases. Conditional logistic regression analysis showed that there no significant association between discussing the pregnancy issue with their husband with disagreement and unplanned caesarean birth among mothers (p = 0.275). The odds of unplanned caesarean birth among mothers who discuss the pregnancy issue with their husbands disagree about 0.5 - fold (mOR: 0.29; 95% CI: 0.03, 2.65) unplanned caesarean birth compared to controls (Table 4.6).

4.2.6.8 Before pregnancy, did you have the desire to get pregnant

Before pregnancy, have the desire to get pregnant? The distribution of the study population before pregnancy, having the desire to get pregnant was 20 (10%) of controls compared to 17 (8.5%) of cases. Conditional logistic regression analysis showed that there is no significant association between before pregnancy, haven't desire to get pregnant, and unplanned caesarean birth among mothers (p = 0.525). The odds of unplanned caesarean birth among mothers who had before pregnancy, and haven't desire to get pregnant about 1.0 - fold (mOR: 0.8; 95% CI: 0.41, 1.58) unplanned caesarean birth compared to controls (Table 4.6). Also, the distribution of the study population before pregnancy, who don't know a desire to get pregnant was 13 (6.5%) controls compared to 6 (3%) cases. Conditional logistic regression analysis showed that there was no significant association between don't know a desire to get pregnant and unplanned caesarean birth among mothers (p = 0.100). The odds of unplanned caesarean birth among mothers who had before pregnancy, have the desire to get pregnant about 0.5 - fold (mOR: 0.44; 95% CI: 0.16, 1.17) unplanned caesarean birth compared to controls (Table 4.6).

4.2.6.9 Take any steps to terminate the pregnancy

The distribution of the study population by taking any steps to terminate the pregnancy 1 (3%) of controls compared to 3 (13%) of cases. Conditional logistic regression analysis showed that there is a significant association between taking any steps to terminate the pregnancy and unplanned caesarean birth among mothers (p = 0.187). The odds of unplanned caesarean birth among mothers who had taken any steps to terminate the pregnancy were about 5.0 - fold (mOR: 4.8; 95% CI: 0.47, 9.39) unplanned caesarean birth compared to controls (Table 4.6).

4.2.7 Multivariate results of ANC and unplanned caesarean birth

Table (4.7): Adjusted OR of ANC and unplanned caesarean birth

Variables	Categories	Model 1 a			Model 2 b		
		mOR	95% CI	P-value	mOR	95% CI	P-value
Where did you follow up on the last pregnancy?							
	UNRWA clinic (Ref.)	1.0					
	Governmental clinic	0.66	(0.42-1.06)	0.083	0.69	0.33-1.47	0.340
	Non-governmental clinic	1.30	(0.72-2.36)	0.382	0.79	0.49-1.26	0.319
When did you start visiting the ANC clinic during your current pregnancy?							
	1st trimester (Ref.)	1.0			1.0		
	2nd trimester	1.94	(0.67-5.65)	0.221	0.79	0.49-1.26	0.319
	3rd trimester	3.25	(1.06-9.93)	0.039*	1.64	0.9-3.00	0.107
What was the fetal position in the last month of pregnancy?							
	Cephalic (Ref.)	1.0			1.0		
	Breach/ Transverse	13.30	(3.03-58.29)	0.001*	11.96	2.71-52.72	0.001*
Before pregnancy, did you discuss the pregnancy issue with their husband?							
	Yes, agreement (Ref.)	1.0			1.0		
	No	0.14	(0.01-2.06)	0.153	0.21	0.02-1.99	0.176
	Yes, disagreement	0.09	(0.01-1.31)	0.078	0.14	0.02-1.34	0.088

mOR: matched odds ratio; **CI**: confidence interval. [a] adjusted for all significant variables of previous ANC at univariate p-value <0.20. [b] adjusted for demographic characteristics (Age, level of education, current social status, husband's career, mother's career, family members and economic level of the family).

Multivariate conditional logistic regression was used to emphasize the earlier-mentioned results from Univariate analysis. Using stepwise backward selection, the AOR for unplanned caesarean birth was calculated. four factors were found to be independently significant predictors for increasing the likelihood of unplanned caesarean birth, namely mothers' exposure to follow-up in the last pregnancy, start visiting ANC clinic during the current pregnancy, fetal position in the last month of pregnancy before pregnancy discussion the pregnancy issue with their husband (Table 4.7, Model I)

Further analysis was carried out to identify if the pre-mentioned explanatory variables (results of model 1), remained statistically significant predictors for unplanned caesarean birth after adjustment for possible confounders. The final results show that the mothers follow up in the last pregnancy at the Governmental clinic start visiting the ANC clinic during the current pregnancy in 3rd trimester (mOR: 3.25: 95% CI: (1.06-9.93); p = 0.039) and Breach/ Transverse was the fetal position in the last month of pregnancy (mOR: 13.3: 95% CI: (3.03-58.29); p = 0.001) is a higher risk for unplanned caesarean birth than normal delivery. In contrast, follow-up in the last pregnancy at a Governmental clinic (mOR: 0.66:

95% CI: (0.42-1.06); p = 0.083), follow-up in the last pregnancy at a non-governmental clinic (mOR: 1.3: 95% CI: (0.72-2.36); p = 0.382), start visiting ANC clinic during current pregnancy at 2nd trimester (mOR: 1.94: 95% CI: (0.67-5.65); p = 0.221).

Before pregnancy, mothers did not discuss the pregnancy issue with their husband (mOR: 0.14: 95% CI: (0.01-2.06); p = 0.153), did discuss with disagreement the pregnancy issue with their husband (mOR: 0.09: 95% CI: (0.01-1.31). Details of the percentages of the AOR of previous ANC are listed in Table 4.7 above.

However, analysis was carried out to identify if the pre-mentioned four explanatory variables (results of model 2), remained statistically significant predictors for unplanned caesarean birth after adjustment for possible confounders. The final results show that the mother was Breach/ Transverse as the fetal position in the last month of pregnancy (mOR: 11.96: 95% CI: 2.71-52.72; p = 0.001*) is a higher risk for unplanned caesarean birth than normal delivery. In contrast, follow-up in the last pregnancy at a Governmental clinic (mOR: 0.69: 95% CI: 0.33-1.47; p = 0.34), follow-up in the last pregnancy at a Non-governmental clinic (mOR: 0.79: 95% CI: 0.49-1.26; p = 0.319), start visiting ANC clinic during current pregnancy at 2nd trimester (mOR: 0.79: 95% CI: 0.49-1.26; p = 0.319), start visiting ANC clinic during current pregnancy at 3rd trimester (mOR: 1.64: 95% CI: 0.9-3.00; p = 0.107), Before pregnancy, did not discuss the pregnancy issue with their husband? (mOR: 0.21: 95% CI: 0.02-1.99; p = 0.176) and Before pregnancy, did discuss with disagreement the pregnancy issue with their husband (mOR: 0.14: 95% CI: 0.02-1.34; p = 0.088). Details of the percentages of the AOR of previous ANC are listed in Table 4.7 above.

4.2.8 Sporting regimen

Table (4.8): Sporting regimen and unplanned caesarian birth

Variables	Categories	Cases (n=200) N (%)	Controls (n=200) N (%)	Statistical Analysis		
				mOR	95% CI	P-value
Did you do a sporting regimen during their last pregnancy?						
	No	131 (65.5)	119 (59.5)	1.25	0.81-.91	0.310
	Yes, ≥ 3 times/week (Ref.)	60 (30)	68 (34)	1.0		
	Yes, sometimes < 2/week	9 (4.5)	13 (6.5)	0.78	0.31-.97	0.605
Sub-q. Types of sporting regimen						
Deep breathing	Yes (Ref.)	3 (4.3)	13 (16)	1.0	1.0	
	No	66 (95.7)	68 (84)	4.21	1.15-15.44	**0.030***
Physioball exercise	Yes (Ref.)	1 (1.4)	12 (14.8)	1.0		
	No	68 (98.6)	69 (85.2)	11.83	1.5-93.47	**0.019***
Walking	Yes (Ref.)	45 (65.2)	72 (88.9)	1.0		
	No	24 (34.8)	9 (11.1)	4.27	1.82-10	**0.001***
When did you start the sports regimen?						
	1st trimester (Ref.)	6 (8.7)	5 (6.2)	1.0		
	2nd trimester	4 (5.8)	5 (6.2)	0.67	0.11-.92	0.654
	3rd trimester	45 (65.2)	51 (63)	0.74	0.21-.57	0.630
	Before delivery only	14 (20.3)	20 (24.7)	0.58	0.15-.29	0.440
How long has exercise taken?						
	Less than 10 min	35 (50.7)	39 (48.1)	1.01	0.49-.06	0.979
	10-20 min (Ref.)	24 (34.8)	27 (33.3)	1.0		
	More than 20 min	10 (14.5)	15 (18.5)	0.75	0.28-.98	0.561
Physical exercise has been done during their delivery						
Deep breathing	Yes (Ref.)	18 (26.1)	34 (42)	1.0		
	No	51 (73.9)	47 (58)	2.050	1.02-.11	0.043*
Physioball exercise	Yes (Ref.)	1 (1.4)	6 (7.4)	1.0		
	No	68 (98.6)	75 (92.6)	5.440	0.64-46.34	0.121
Walking	Yes (Ref.)	45 (65.2)	61 (75.3)	1.0		
	No	24 (34.8)	20 (24.7)	1.627	0.8-3.3	0.178
Back massage	Yes (Ref.)	8 (11.6)	26 (32.1)	1.0		
	No	61 (88.4)	55 (67.9)	3.605	1.51-8.62	0.004*
Others	Yes (Ref.)	35 (50.7)	25 (30.9)	1.0		
	No	34 (49.3)	56 (69.1)	2.306	1.18-4.49	0.014*
Did you do sport while you suffering from vaginal bleeding?						
	Yes	1 (1.5)	3 (3.7)	2.58	0.26-25.36	0.417
	No (Ref.)	67 (98.5)	78 (96.3)	1.0		

*P < 0.05: significant, P ≥ 0.05: not significant; **n:** number**; mOR**: matched odds ratio & **CI**: confidence interval.

4.2.8.1 A sporting regimen during their last pregnancy

The distribution of the study population doing a sporting regimen during their last pregnancy was 119 (59.5%) controls compared to 131 (65.5%) cases. Conditional logistic regression analysis showed that there is no significant association between mothers doing a sporting regimen during their last pregnancy and unplanned caesarean birth among mothers (p = 0.31). The odds of unplanned caesarean birth among mothers who had a sporting regimen

during their last pregnancy were about 1.25 - fold (mOR: 1.25; 95% CI: 0.81, 1.91) unplanned caesarean birth compared to controls (Table 4.8). Also, the distribution of the study population by doing a sporting regimen during their last pregnancy was 13 (6.5%) controls compared to 9 (4.5%) cases. Conditional logistic regression analysis showed that there is no significant association between current diagnoses by doing a sporting regimen during their last pregnancy and unplanned caesarean birth among mothers (p = 0.605). The odds of unplanned caesarean birth among mothers who had a sporting regimen during their last pregnancy were about 0.78 - fold (mOR: 0.78; 95% CI: 0.31, 1.97) unplanned caesarean birth compared to controls (Table 4.8).

4.2.8.2 Deep breathing sporting regimen during their last pregnancy

The distribution of the study population about not exhibiting deep breathing sporting regimen during their last pregnancy was 68 (84%) of controls compared to 66 (95.7%) of cases. Conditional logistic regression analysis showed that there is no significant association between no deep breathing sporting regimen during their last pregnancy and unplanned caesarean birth among mothers (p = 0.030). The odds of unplanned caesarean birth among mothers who hadn't deep breathing was about 4.0 - fold (mOR: 4.21; 95% CI: 1.15, 5.44) unplanned caesarean birth compared to controls (Table 4.8).

4.2.8.3 Physioball exercise sporting regimen during their last pregnancy

The distribution of the study population by no physioball exercise sporting regimen during their last pregnancy was 69 (85.2%) controls compared to 68 (98.6%) cases. Conditional logistic regression analysis showed that there is a significant association between mothers who hadn't physioball exercise sporting regimen during their last pregnancy and unplanned caesarean birth among mothers (p = 0.019). The odds of unplanned caesarean birth among mothers who hadn't physioball exercise sporting regimen during their last pregnancy was about 11.0 - fold (mOR: 11.83; 95% CI: 1.5-, 3.47) unplanned caesarean birth compared to controls (Table 4.8).

4.2.8.4 Walking sporting regimen during their last pregnancy

The distribution of the study population by not exhibiting a walking regimen 9 (11.1%) of controls compared to 24 (34.8%) of cases. Conditional logistic regression analysis showed that there is a significant association between no Walking and unplanned caesarean birth

among mothers (p = 0.001). The odds of unplanned caesarean birth among mothers who hadn't walked was about 4.0 – folds (mOR: 4.27; 95% CI: 1.82, 2-10) unplanned caesarean birth compared to controls (Table 4.8).

4.2.8.5 Start the sports regimen

The distribution of the study population by the start of the sports regimen in 2nd trimester was 5 (6.2%) controls compared to 4 (5.8%) cases. Conditional logistic regression analysis showed that there is no significant association between starting the sports regimen 2nd trimester and unplanned caesarean birth among mothers (p = 0.654). The odds of unplanned caesarean birth among mothers who started the sports regimen in 2nd trimester were about 0.67 - fold (mOR: 0.67; 95% CI: 0.11, 3.92) unplanned caesarean birth compared to controls (Table 4.8). Also, the distribution of the study population by starting the sports regimen in 3rd trimester was 51 (63%) of controls compared to 45 (65.2%) of cases. Conditional logistic regression analysis showed that there was no significant association between the start of the sports regimen in 3rd trimester and unplanned caesarean birth among mothers (p = 0.630). The odds of unplanned caesarean birth among mothers 'who started the sports regimen in 3rd trimester were about 0.74 - fold (mOR: 0.74; 95% CI: 0.21, 2.57) unplanned caesarean birth compared to controls (Table 4.8). The distribution of the study population by the start of the sports regimen before delivery only was 65 (80.2%) controls compared to 68 (98.6%) cases. Conditional logistic regression analysis showed that there was no significant association between starting the sports regimen before delivery only and unplanned caesarean birth among mothers (p = 0.440). The odds of unplanned caesarean birth among mothers who had started the sports regimen in 3rd trimester were about 0.58 - fold (mOR: 0.58; 95% CI: 0.15, 2.29) unplanned caesarean birth compared to controls (Table 4.8).

4.2.8.6 Long has exercise been taken

The distribution of the study population of long has exercise taken 39 (48.1%) of controls compared to 35 (50.7%) of cases. Conditional logistic regression analysis showed that there was no significant association between long exercise being taken and unplanned caesarean birth among mothers (p = 0.979). The odds of unplanned caesarean birth among mothers had long exercise been taken about 1.01 - fold (mOR: 1.01; 95% CI: 0.49, 2.06) unplanned caesarean birth compared to controls (Table 4.8). Also, the distribution of the study population by long has exercise taken 15 (18.5%) of controls compared to 10 (14.5%) of

cases. Conditional logistic regression analysis showed that there was no significant association between long exercise being taken and unplanned caesarean birth among mothers (p = 0.561). The odds of unplanned caesarean birth among mothers had long exercise has been taken about 0.75 - fold (mOR: 0.75; 95% CI: 0.28, 1.98) unplanned caesarean birth compared to controls (Table 4.8).

4.2.8.7 Physical exercise has been done during their delivery

4.2.8.7.1 Deep breathing has been done during their delivery

The distribution of the study population of hadn't deep breathing exercises has been done at their delivery 47 (58%) of controls compared to 51 (73.9%) of cases. Conditional logistic regression analysis showed that there is a significant association between hadn't deep breathing exercises been done at their delivery and unplanned caesarean birth among mothers (p = 0.043). The odds of unplanned caesarean birth among mothers who hadn't done deep breathing exercises have been done at their delivery about 2.0 - fold (mOR: 2.05; 95% CI: 1.02, 4.11) unplanned caesarean birth compared to controls (Table 4.8).

4.2.8.7.2 Physioball exercise has been done at their delivery

The distribution of the study population by hadn't Physioball exercise 75 (92.6%) of controls compared to 68 (98.6%) of cases. Conditional logistic regression analysis showed that there was no significant association between hadn't physioball exercise and unplanned caesarean birth among mothers (p = 0.121). The odds of unplanned caesarean birth among mothers who hadn't Physioball exercise was about 5.44 - fold (mOR: 5.44; 95% CI: 0.64, 6.34) unplanned caesarean birth compared to controls (Table 4.8).

4.2.8.7.3 Walking has been done at their delivery

The distribution of the study population by hadn't Walking 20 (24.7) of controls compared to 24 (34.8) of cases. Conditional logistic regression analysis showed that there is a significant association between hadn't walked and unplanned caesarean birth among mothers (p = 0.178). The odds of unplanned caesarean birth among mothers who hadn't walking about 2.0 - fold (mOR: 1.627; 95% CI: 0.80, 3.3) unplanned caesarean birth compared to controls (Table 4.8).

4.2.8.7.4 Back massage has been done at their delivery

The distribution of the study population by hadn't Back massage 55 (67.9%) of controls compared to 61 (88.4%) of cases. Conditional logistic regression analysis showed that there is a significant association between hadn't back massage and unplanned caesarean birth among mothers (p = 0.004). The odds of unplanned caesarean birth among mothers who hadn't Back massages were about 3.605 - fold (mOR: 3.605; 95% CI: 1.51, 8.62) unplanned caesarean birth compared to controls (Table 4.8).

4.2.8.7.5 Other's exercise has been done during their delivery

The distribution of the study population by hadn't others exercise has been done at their delivery was 56 (69.1) of controls compared to 34 (49.3) of cases. Conditional logistic regression analysis showed that there is a significant association between hadn't other exercises have been done at their delivery and unplanned caesarean birth among mothers (p = 0.014). The odds of unplanned caesarean birth among mothers who hadn't done other exercises have been done at their delivery about 2.0 - fold (mOR: 2.306; 95% CI: 1.18, 4.49) unplanned caesarean birth compared to controls (Table 4.8).

4.2.8.8 Sport while you suffering from vaginal bleeding

The distribution of the study population doing sport while you suffer from vaginal bleeding is 3 (3.7%) of controls compared to 1 (1.5%) of cases. Conditional logistic regression analysis showed that there is no significant association between doing sport while you suffering from vaginal bleeding and unplanned caesarean birth among mothers (p = 0.417). The odds of unplanned caesarean birth among mothers who had sport while you suffering from vaginal bleeding were about 3 - fold (mOR: 2.58; 95% CI: 0.26, 5.36) unplanned caesarean birth compared to controls (Table 4.8).

4.2.9 Multivariate results of sporting regimen and unplanned caesarean birth

Table (4.9): Adjusted OR of sporting regimen

Variables	Categories	Model 1 [a]			Model 2 [b]		
		mOR	95% CI	P-value	mOR	95% CI	P-value
Sporting regimen during their last pregnancy							
Deep breathing	Yes (Ref.)	1.0			1.0		
	No	1.742	0.14-3.84	0.722	8.71	1.06-71.81	0.044
Physioball exercise	Yes (Ref.)	1.0			1.0		
	No	9.880	0.91-107.14	0.060	10.67	1.31-87.05	0.027*
Walking	Yes (Ref.)	1.0			1.0		
	No	7.164	2.24-22.89	0.001	4.58	1.8-11.67	0.001*
Physical exercise has been done at their delivery							
Deep breathing	Yes (Ref.)	1.0			1.0		
	No	1.414	0.59-3.36	0.433	2.43	1.15-5.17	0.020*
Physioball exercise	Yes (Ref.)	1.0			1.0		
	No	8.075	0.5-129.3	0.140	4.79	0.53-43.66	0.165
Walking	Yes (Ref.)	1.0			1.0		
	No	1.495	0.18-1.38	0.180	1.66	0.78-3.51	0.185
Back massage	Yes (Ref.)	1.0			1.0		
	No	4.112	1.46-11.58	0.007	4.03	1.56-10.44	0.004*
Others	Yes (Ref.)	1.0			1.0		
	No	1.786	0.71-4.48	0.217	1.89	0.93-3.85	0.079

mOR: matched odds ratio; **CI**: confidence interval. [a] adjusted for all significant variables of sporting regimen at univariate p-value <0.20. [b] adjusted for demographic characteristics (Age, level of education, current social statues, husband's career, mother's career, family members, and economic level of the family).

Multivariate conditional logistic regression was used to emphasize the earlier-mentioned results from Univariate analysis. Using stepwise backward selection, the AOR for unplanned caesarean birth was calculated. four factors were found to be independently significant predictors for increasing the likelihood of unplanned caesarean birth, namely mothers hadn't exercise deep breathing, physio ball exercise, walking, back massage, physical exercise has been done at their delivery as hadn't deep breathing, physio ball exercise, walking and back massage (Table 4.9, Model I).

Further analysis was carried out to identify if the pre-mentioned explanatory variables (results of 4.9, model 1), remained statistically significant predictors for unplanned caesarean birth after adjustment for possible confounders. It's showed that mothers hadn't exercise the next during their last pregnancy (i) walking regimen (mOR: 7.1; p = 0.001), while the risk of lack exercise at delivery were significantly related to hadn't exercise back massage at their delivery (mOR: 4.1; p = 0.007). In disparity, maternal failure to exercise deep breathing during their last pregnancy (mOR: 1.742; p = 0.722) and physioball (mOR: 9.8; p = 0.060), were not significant risk for unplanned caesarean birth than normal delivery; while the results (Model 1) physical exercise at delivery showed that lack deep breathing

exercise (mOR: 1.4; p = 0.433), physioball exercise (mOR: 8.075, p = 0.14) and walking physical exercise (mOR: 1.49; p = 0.180) were not significant risk for unplanned caesarean birth than normal delivery.

However, analysis was carried out to identify if the pre-mentioned five explanatory variables (results of model 2), remained statistically significant predictors for unplanned caesarean birth after adjustment for possible confounders. The final results show that mothers hadn't deep breathing sporting regimen during their last pregnancy (mOR: 8.71: 95% CI: 1.06-71.81; p = 0.044), hadn't physio ball sporting regimen during their last pregnancy (mOR: 10.67: 95% CI: 1.31-87.05; p = 0.027), hadn't Walking sporting regimen during their last pregnancy (mOR: 4.58: 95% CI: 1.8-11.67; p = 0.001), and hadn't Deep breathing physical exercise has been done at their delivery (mOR: 2.43: 95% CI: 1.15-5.17; p = 0.020), and hadn't back massage physical exercise has been done at their delivery (mOR: 4.03: 95% CI: 1.56-10.44; p = 0.004) were significantly higher risk for unplanned caesarean birth than normal delivery. While there is not a significant risk for unplanned caesarean birth than normal delivery among mothers who hadn't physioball exercise physical exercise has been done at their delivery (mOR: 4.79: 95% CI: 0.53-43.66; p = 0.165), hadn't walked physical exercise has been done at their delivery (mOR: 1.66: 95% CI: 0.78-3.51; p = 0.185), and hadn't others physical exercise has been done at their delivery (mOR: 1.89: 95% CI: 0.93-3.85; p = 0.079).

4.2.10 Psychological and social stressors during pregnancy and unplanned caesarean birth

Table (4.10): Psychological and social stressors during pregnancy

Variables	Categories	Cases (n=200) N (%)	Controls (n=200) N (%)	Statistical Analysis		
				OR	95% CI	P-value
Since the beginning of pregnancy, have you felt safe within their family?						
	Yes (Ref.)	196 (98)	197 (98.5)	1.0		
	No	4 (2)	3 (1.5)	1.34	0.3-6.07	0.704
Since becoming pregnant, have you felt exhausted resulting from excessive social responsibilities in your home?						
	Yes	105 (52.5)	117 (58.5)	0.78	0.53-1.16	0.228
	No (Ref.)	95 (47.5)	83 (41.5)	1.0		
How do you rate the level of psychological pressures you faced during your last pregnancy?						
	No	202 (50.5)	163 (81.5)	1.0		
	Mild	72 (18.0)	18 (9.0)	12.538	6.63-23.72	0.000*
	Moderate	45 (11.3)	11 (5.5)	12.918	6.02-27.74	0.000*

Table (4.10): Continued

	Severe	81 (20.3)	8 (4.0)	8.138	8.98-15.67	0.000*
Since becoming pregnant, have you lived with your husband's family?						
	Yes (Ref.)	25 (12.5)	22 (11)	1.0		
	No	175 (87.5)	178 (89)	0.87	0.47-1.59	0.642
Did living with your husband's family improve your psychological state during pregnancy?						
		N (25)	**N (22)**			
	Yes (Ref.)	19 (76)	19 (86.4)	1.0		
	No	6 (24)	3 (13.6)	0.50	0.11-2.3	0.373
Did you expose yourself to domestic violence during your last pregnancy?						
	Yes	16 (8)	3 (1.5)	5.71	1.64-19.92	**0.006***
	No (Ref.)	184 (92)	197 (98.5)	1.0		
Have you had a hard birth during their current delivery?						
	Yes	124 (62)	84 (42)	2.25	1.51-3.36	**0.000***
	No (Ref.)	76 (38)	116 (58)	1.0		
Since the beginning of pregnancy, have you felt anxiously in continuous manner?						
	Yes	12 (6)	5 (2.5)	2.48	0.1-1.01	0.043
	No (Ref.)	188 (94)	195 (97.5)	1.0		
*P < 0.05: significant, P ≥ 0.05: not significant; **n:** number; **mOR:** matched odds ratio& **CI:** confidence interval.						

4.2.10.1.1 Felt safe within their family since the beginning the of pregnancy

The distribution of the study population according to since the beginning of pregnancy, have you felt safe within their family showed that 3 (1.5%) of controls compared to 4 (2%) of cases. Conditional logistic regression analysis showed that there no significant association between felt safe within their family since the beginning of pregnancy and unplanned caesarean birth among mothers (p = 0.704). The odds of unplanned caesarean birth among mothers who had felt safe within their family since beginning the of pregnancy were about 1.34 - fold (mOR: 1.34; 95% CI: 0.3-, 6.07) unplanned caesarean birth compared to controls (Table 4.10).

4.2.10.1.2 Felt exhausted from excessive social responsibilities since beginning of pregnancy

The distribution of the study population according to since the beginning of pregnancy, have you felt exhausted showed that 117 (58.5) of controls compared to 105 (52.5) of cases. Conditional logistic regression analysis showed that there no significant association (p = 0.228) between felt exhausted from excessive social responsibilities since beginning of pregnancy and unplanned caesarean birth among mothers (Table 4.10).

4.2.10.1.3 Maternal rating of psychological pressures you faced during your last pregnancy

The distribution of the study population according to the rate the level of psychological pressures faced during their last pregnancy showed that 18 (9.0%) of controls compared to 72 (18.0%) of cases. Conditional logistic regression analysis showed that there is a significant association between had mild rate of the level of psychological pressures faced during their last pregnancy and unplanned caesarean birth among mothers ($p < 0.001$). The odds of unplanned caesarean birth among mothers had a mild rate of the level of psychological pressures faced during their last pregnancy about 13 - fold (mOR: 12.53; 95% CI: 6.63, 3.72) unplanned caesarean birth compared to controls (Table 4.10). Also, a moderate rate of the level of psychological pressures you faced during your last pregnancy showed that 11 (5.5%) of controls compared to 45 (11.3%) of cases. Conditional logistic regression analysis showed that there is a significant association between a moderate rate of the level of psychological pressures you faced during your last pregnancy and unplanned caesarean birth among mothers ($p = 0.000$). The odds of unplanned caesarean birth among mothers 'had a moderate rate of the level of psychological pressures faced during their last pregnancy about 12.918 - fold (mOR: 12.918; 95% CI: 6.02, 7.74) unplanned caesarean birth compared to controls (Table 4.10). Sever rate the level of psychological pressures you faced during their last pregnancy? The distribution of the study population by the severe rate of the level of psychological pressures they faced during their last pregnancy 8 (4.0%) of controls compared to 81 (20.3%) of cases. Conditional logistic regression analysis showed that there is a significant association between severe rates and the level of psychological pressures you faced during your last pregnancy and unplanned caesarean birth among mothers ($p = 0.000$). The odds of unplanned caesarean birth among mothers had a severe rate of the level of psychological pressures they faced during their last pregnancy about 8-fold (mOR: about 8.138; 95% CI: 8.98, 5.67) unplanned caesarean birth compared to controls (Table 4.10).

4.2.10.1.4 Maternal living with their husband's families improve their psychological state during pregnancy

The distribution of the study population according to mothers living with their husband's family improves their psychological state during pregnancy showed that 3 (13.6%) of controls compared to 6 (24%) of cases. Conditional logistic regression analysis showed that

there is no significant association between mothers living with their husband's family improving their psychological state during pregnancy showed an unplanned caesarean birth among mothers (p = 0.373). The odds of unplanned caesarean birth among mothers had mothers living with their husband's families improved their psychological state during pregnancy showed about 0.5 - fold (mOR: about 0.5; 95% CI: 0.11, -2.3) unplanned caesarean birth compared to controls (Table 4.10).

4.2.10.1.5 Expose to domestic violence during their last pregnancy

The distribution of the study population according to exposure to domestic violence during their last pregnancy showed that 3 (1.5%) of controls compared to 16 (8%) of cases. Conditional logistic regression analysis showed that there is a significant association between exposure to domestic violence during their last pregnancy and unplanned caesarean birth among mothers (p = 0.006). The odds of unplanned caesarean birth among mothers who had to expose to domestic violence during their last pregnancy were about 6 - fold (mOR: 5.71; 95% CI: 1.64, 9.92) unplanned caesarean birth compared to controls (Table 4.10).

4.2.10.1.6 Hard birth during their current delivery

The distribution of the study population according to had a hard birth during their current delivery showed 84 (42%) controls compared to 124 (62%) cases. Conditional logistic regression analysis showed that there is a significant association between mothers who had a hard birth during their current delivery and unplanned caesarean birth among mothers (p < 0.001). The odds of unplanned caesarean birth among mothers who had a hard birth during their current delivery are about 2- fold (mOR: 2.25; 95% CI: 1.51, 3.36) unplanned caesarean birth compared to controls (Table 4.10).

- **Felt anxiously in continuous manner since beginning of pregnancy**

The distribution of the study population according to anxious maternal feeling during their last pregnancy showed in table 4.10. Of the study population, 5 (2.5%) controls compared to 12 (6%) cases. Conditional logistic regression analysis showed that there was a significant association between felt continuous anxious during pregnancy and unplanned caesarean birth among mothers (p = 0.043). The odds of unplanned caesarean birth among mothers had

other things anxious during their last pregnancy about 2.5- fold (mOR: 2.48) unplanned caesarean birth compared to controls (Table 4.10).

4.2.11 Multivariate results of psychological and social stressors during pregnancy

Table (4.11): Adjusted OR of psychological and social stressors during pregnancy

Variables	Categories	Model 1 [a]			Model 2 [b]		
		mOR	95% CI	P-value	mOR	95% CI	P-value
How do you rate the level of psychological pressures you faced during your last pregnancy?							
	No	1.0			1.0		
	Mild	2.051	0.71-5.94	0.185	2.85	1.12-7.22	0.027*
	Moderate	2.590	1.03-6.52	0.043	3.00	1.06-8.5	0.038*
	Severe	4.238	2.01-8.11	0.000	4.31	2.2-9.33	0.000*
Did you expose yourself to domestic violence during your last pregnancy?							
	Yes	3.712	0.84-16.41	0.084	5.93	1.65-21.29	0.006*
	No (Ref.)	1.0			1.0		
Have you had a hard birth during their current delivery?							
	Yes	1.607	0.31-8.25	0.569	2.17	1.43-3.28	0.000*
	No (Ref.)	1.0					
Since the beginning of pregnancy, have you felt anxiously in continuous manner?							
	Yes	1.56	0.78-2.25	0.023*	3.93	1.65-21.29	0.006*
	No (Ref.)	1.0			1.0		

mOR: matched odds ratio; **CI**: confidence interval.
[a] adjusted for all significant variables of sporting regimen at univariate p-value <0.20.
[b] adjusted for demographic characteristics (Age, level of education, current social status, husband's career, mother's career, family members, and economic level of the family).

Multivariate conditional logistic regression was used to emphasize the earlier-mentioned results from univariate analysis. Using stepwise backward selection, the AOR for unplanned caesarean birth was calculated four factors were found to be independently significant predictors for increasing the likelihood of unplanned caesarean birth, namely mothers had rated the level of psychological pressures they faced during their last pregnancy as exposure to domestic violence during their last pregnancy, and had a hard birth during current delivery. Also, maternal reporting she had felt anxiously in continues manner since the beginning of pregnancy was at about 1.5 time higher odds than non-exposed (Table 4.11, Model 1).

Further analysis was carried out to identify if the pre-mentioned explanatory variables (results of model 1), remained statistically significant predictors for unplanned caesarean birth after adjustment for possible confounders. The final results show that mothers had a mild rates level of psychological pressures they faced during mothers had Severe rate level of psychological pressures faced during mothers last pregnancy (mOR: 4.238: 95% CI: 2.01-8.11; p = 0.000) is a significant risk factor for unplanned caesarean birth. While mothers last pregnancy (mOR: 2.051: 95% CI: 0.71-5.94; p = 0.185), mothers had a moderate rate of the

level of psychological pressures they faced during mothers last pregnancy (mOR: 2.59: 95% CI: 1.03-6.52; p = 0.043), mothers had exposed to domestic violence during mothers last pregnancy (mOR: 3.712: 95% CI: 0.84-16.41; p = 0.084), mothers had a hard birth during mothers current delivery (mOR: 1.607: 95% CI: 0.31-8.25; p = 0.569) were not significantly related to unplanned CS in Model 1(Table 4.11).

However, analysis was carried out to identify if the pre-mentioned five explanatory variables (results of model 2), remained statistically significant predictors for unplanned caesarean birth after adjustment for possible confounders. The final results show that mothers had mild rates of the level of psychological pressures they faced during their mothers' last pregnancy (mOR: 2.85; p = 0.027), mothers had a moderate rate of the level of psychological pressures you faced during mothers last pregnancy? (mOR: 3; p = 0.038), mothers had a severe rate of the level of psychological pressures they faced during mothers last pregnancy (mOR: 4.31: 95% CI: 2.2-9.33; p < 0.001), mothers had expose to domestic violence during mothers last pregnancy (mOR: 5.93; p = 0.006), mothers had a hard birth during mothers current delivery (mOR: 2.17; p = 0.000), felt anxiously in continuous manner last pregnancy (mOR: 3.93; p = 0.006) were significant risk factor for unplanned caesarean birth.

4.2.12 Nursing implications and occurrence of unplanned caesarean birth

Table (4.12a): Univariate analysis of nursing implications and occurrence of unplanned caesarean birth

Variables	Categories	Cases (n=200) n (%)	Controls (n=200) n (%)	Statistical Analysis		
				mOR	95% CI	P-value
Did they receive nursing ANC during their last pregnancy in primary care centres?						
	Yes (Ref.)	170 (85)	174 (87)	1.0		
	No	30 (15)	26 (13)	1.18	0.67-2.08	0.565
Have their instructed about sporting regimens in ANC?						
		170	**174**			
	Yes (Ref.)	54 (32)	81 (47)	1.0		
	No	116 (68)	93 (53)	1.84	1.21-2.8	**0.005***
Sub-q.: Types of instructions by sporting regimen during their pregnancy						
Deep breathing	Yes (Ref.)	38 (70.4)	57 (70.4)	1.0		
	No	16 (29.6)	24 (29.6)	1.7	1.06-2.71	0.026
Walking	Yes (Ref.)	49 (90.7)	75 (92.6)	1.0		
	No	5 (9.3)	6 (7.4)	1.00	0.47-2.13	1.000
Physioball exercise	Yes (Ref.)	6 (11.1)	10 (12.3)	1.0		
	No	48 (88.9)	71 (87.7)	1.28	0.37-4.41	0.701
Back massage	Yes (Ref.)	22 (40.7)	43 (53.1)	1.0		
	No	32 (59.3)	38 (46.9)	1.65	0.82-3.3	0.161
Did they receive comprehensive nursing care through visits?						
	Yes (Ref.)	149 (88)	151 (87)	1.0		
	No	21 (12)	23 (13)	1.05	0.67-1.66	0.817
How many times did their visit the antenatal clinic during their last pregnancy?						
	1-3 times	33 (16.5)	38 (19)	0.56	0.32-0.98	**0.041***
	4-8 times	60 (30)	93 (46.5)	0.42	0.27-0.65	**0.000***
	≥9 times (Ref.)	107 (53.5)	69 (34.5)	1.0		
Have their received an explanation of the birth process to reduce their fear factor						
	Yes (Ref.)	52 (31)	74 (43)	1.0		
	No	118 (69)	100 (57)	1.67	1.09-2.56	**0.018***
Did they have any instructions about their fetus's position before delivery?						
	Yes (Ref.)	135 (79.5)	147 (84.5)	1.0		
	No	35 (20.5)	27 (15.5)	1.34	0.87-2.06	0.189
Did the health care providers introduce themselves during giving service?						
	Yes (Ref.)	95 (56.5)	99 (56.9)	1.0		
	No	75 (43.5)	75 (43.1)	1.01	0.66-1.56	0.948
Did receive an explanation about conducted procedures or services during nursing care?						
	Yes (Ref.)	92 (54)	98 (56.4)	1.0		
	No	78 (46)	72 (43.6)	1.09	0.71-1.69	0.681
Did receive educational instructions about sporting during ANC visits?						
	Yes (Ref.)	33 (19.5)	33 (19)	1.0		
	No	137 (80.5)	141 (81)	1.0	0.59-1.7	1.000
Sub Q.: Sporting regimen/s were instructed at primary health care						
		N= 33	**N= 33**			
Back massage	Yes (Ref.)	8 (24.2)	8 (24.2)	1.0		
	No	25 (75.8)	25 (75.8)	1.0	0.32-3.08	1.000
Deep breathing	Yes (Ref.)	11 (33.3)	9 (27.3)	1.0		
	No	22 (66.7)	24 (72.7)	0.75	0.26-2.15	0.593
Walking	Yes (Ref.)	15 (45.5)	13 (39.4)	1.0		
	No	18 (54.5)	20 (60.6)	0.78	0.29-2.07	0.619
Physioball	Yes (Ref.)	1 (3)	4 (12.1)	1.0		
	No	32 (97)	29 (87.9)	4.41	0.47-41.8	0.196

*P < 0.05: significant, P ≥ 0.05: not significant; **n:** number; mOR: matched odds ratio & CI: confidence interval.

– **Mothers receive nursing ANC during last pregnancy in primary care centers**

The distribution of the study population according to mothers no receive nursing ANC during their last pregnancy in primary care centers showed that 26 (13%) of controls compared to 30 (15%) of cases. Conditional logistic regression analysis showed that there was no significant association between mothers not receiving nursing ANC during their last pregnancy in primary care centers and unplanned caesarean birth among mothers (p = 0.565). The odds of unplanned caesarean birth among mothers who had mothers not received nursing ANC during their last pregnancy in primary care centers 1.0 - fold (mOR: 1.18; 95% CI: 0.6, 2.08) unplanned caesarean birth compared to controls (Table 4.12a).

– **Mothers instructed by sporting regimen during their pregnancy**

The distribution of the study population according to mothers who hadn't been instructed by sporting regimen during their pregnancy showed 93 (53%) controls compared to 116 (68%) cases. Conditional logistic regression analysis showed that there was a significant association between mothers who hadn't been instructed by sporting regimens during their pregnancy and unplanned caesarean birth among mothers (p = 0.005). The odds of unplanned caesarean birth among mothers who hadn't been instructed by sporting regimen during their pregnancy? 1.84 - fold (mOR: 1.84; 95% CI: 1.2, -2.8) unplanned caesarean birth compared to controls (Table 4.12a).

4.2.12.1.1 Deep breathing is instructed by sporting regimen during their pregnancy

The distribution of the study population according to mothers who hadn't deep breathing instructed by sporting regimen during their pregnancy showed 24 (29.6%) controls compared to 16 (29.6%) cases. Conditional logistic regression analysis showed that there was a significant association between mothers who hadn't deep breathing instructed by sporting regimen during their pregnancy and unplanned caesarean birth among mothers (p = 0.026). The odds of unplanned caesarean birth among mothers who hadn't deep breathing instructed by sporting regimen during their pregnancy 2 - fold (mOR: 1.7; 95% CI: 1.0, 2.71) unplanned caesarean birth compared to controls (Table 4.12a).

4.2.12.1.2 Walking sporting regimen during their pregnancy

The distribution of the study population according to mothers who hadn't walked sporting regimens during their pregnancy showed 6 (7.4%) controls compared to 5 (9.3%) cases.

Conditional logistic regression analysis showed that there was no significant association between mothers who hadn't walked a sporting regimen during their pregnancy and unplanned caesarean birth among mothers (p = 1.000). The odds of unplanned caesarean birth among mothers who hadn't walked sporting regimen during their pregnancy 1 - fold (mOR: 1; 95% CI: 0.4, 2.13) unplanned caesarean birth compared to controls (Table 4.12a).

4.2.12.1.3 Physioball exercise sporting regimen during their pregnancy

The distribution of the study population according to mothers who hadn't physioball exercise sporting regimen during their pregnancy showed 71 (87.7%) controls compared to 48 (88.9%) cases. Conditional logistic regression analysis showed that there was no significant association between mothers who hadn't physioball exercise sporting regimen during their pregnancy and unplanned caesarean birth among mothers (p = 0.701). The odds of unplanned caesarean birth among mothers who hadn't physioball exercise sporting regimen during their pregnancy 1.28 - fold (mOR: 1.28; 95% CI: 0.3, 4.41) unplanned caesarean birth compared to controls (Table 4.12a).

4.2.12.1.4 Back massage sporting regimen during their pregnancy

The distribution of the study population according to mothers who hadn't back massage sporting regimen during their pregnancy showed 38 (46.9%) controls compared to 32 (59.3) cases. Conditional logistic regression analysis showed that there was no significant association between mothers who hadn't back massage sporting regimens during their pregnancy and unplanned caesarean birth among mothers (p = 0.161). The odds of unplanned caesarean birth among mothers who hadn't had back massage sporting regimen during their pregnancy 2 - fold (mOR: 1.65; 95% CI: 0.800, 3.30) unplanned caesarean birth compared to controls (Table 4.12a).

4.2.12.1.5 Others' sporting regimens during their pregnancy

The distribution of the study population according to mothers who hadn't other sporting regimens during their pregnancy showed 74 (91.4%) controls compared to 53 (98.1%) cases. Conditional logistic regression analysis showed that there was no significant association between mothers who hadn't other sporting regimens during their pregnancy and unplanned caesarean birth among mothers (p = 0.137). The odds of unplanned caesarean birth among

mothers who hadn't had another sporting regimen during their pregnancy 5.01 - fold (mOR: 5.01; 95% CI: 0.6, 1.97) unplanned caesarean birth compared to controls (Table 4.12a).

4.2.12.1.6 Receive comprehensive nursing care through visits

The distribution of the study population according to mothers no receive comprehensive nursing care through visits showed 23 (13%) controls compared to 21 (12%) cases. Conditional logistic regression analysis showed that there is no significant association between mothers not receiving comprehensive nursing care through visits and unplanned caesarean birth among mothers (p = 0.817). The odds of unplanned caesarean birth among mothers who had mothers no receive comprehensive nursing care through visits 1.05 - fold (mOR: 1.05; 95% CI: 0.6, 1.66) unplanned caesarean birth compared to controls (Table 4.12a).

4.2.12.1.7 Times did their visit the antenatal clinic during their last pregnancy

The distribution of the study population according to 1-3 times did you visit the antenatal clinic during their last pregnancy showed 38 (19%) controls compared to 33 (16.5%) cases. Conditional logistic regression analysis showed that there was a significant association between 1-3 times their visit to the antenatal clinic during their last pregnancy and unplanned caesarean birth among mothers (p = 0.041*). The odds of unplanned caesarean birth among mothers who had 1-3 times did their visits to the ANC clinic during their last pregnancy 0.56 - fold (mOR: 0.56; 95% CI: 0.3, 0.98) unplanned caesarean birth compared to controls (Table 4.12a). Also, the distribution of the study population by 4-8 times did their visits the ANC clinic during their last pregnancy 93 (46.5%) controls compared to 60 (30%) cases. Conditional logistic regression analysis showed that there is a significant association between Current diagnoses by 4-8 times they visited the antenatal clinic during their last pregnancy and unplanned caesarean birth among mothers (p < 0.001). The odds of unplanned caesarean birth among mothers who had 4-8 visits to the ANC clinic during their last pregnancy was about 0.42- fold (mOR: about 0.42; 95% CI: 0.2, 0.65) unplanned caesarean birth compared to controls (Table 4.12a).

4.2.12.1.8 Received an explanation of the birth process to reduce their fear factor

The distribution of the study population according to mothers not received an explanation of the birth process to reduce their fear factor showed 100 (57%) of controls compared to 118

(69%) of cases. Conditional logistic regression analysis showed that there was a significant association between mothers not receiving an explanation of the birth process to reduce their fear factor and unplanned caesarean birth among mothers (p = 0.018). The odds of unplanned caesarean birth among mothers had mothers not received an explanation of the birth process to reduce their fear factor 2 - fold (mOR: 1.67; 95% CI: 1.0, 2.56) unplanned caesarean birth compared to controls (Table 4.12a).

4.2.12.1.9 Instructions about their fetus's position before delivery

The distribution of the study population according to mothers who hadn't instructions about their fetus's position before delivery showed that 53 (16%) of controls compared to 65 (20.5%) of cases. Conditional logistic regression analysis showed that there was no significant association between mothers who hadn't been instructed about their fetus's position before delivery and unplanned caesarean birth among mothers (p = 0.189). The odds of unplanned caesarean birth among mothers who hadn't instructions about their fetus's position before delivery were 1.34 - fold (mOR: 1.34; 95% CI: 0.800, 2.06) unplanned caesarean birth compared to controls (Table 4.12a).

4.2.12.1.10 The health care providers introduce themselves during giving service

The distribution of the study population according to mothers hadn't the health care providers introduce themselves during giving service showed that 75 (43.1%) of controls compared to 75 (43.5%) of cases. Conditional logistic regression analysis showed that there was no significant association between mothers who hadn't had the health care providers introduce themselves during giving service and unplanned caesarean birth among mothers (p = 0.948). The odds of unplanned caesarean birth among mothers who hadn't had the health care providers introduce themselves during giving service 1 - fold (mOR: 1.01; 95% CI: 0.66, 1.56) unplanned caesarean birth compared to controls (Table 4.12a).

4.2.12.1.11 Receive an explanation about conducted procedures or services during nursing care

The distribution of the study population according to mothers who hadn't received an explanation about conducted procedures or services during nursing care showed 76 (43.6%) controls compared to 78 (46%) cases. Conditional logistic regression analysis showed that there is no significant association between mothers does not receive an explanation about

conducted procedures or services during nursing care and unplanned caesarean birth among mothers (p = 0.681). The odds of unplanned caesarean birth among mothers who hadn't received an explanation about conducted procedures or services during nursing care 1- fold (mOR: 1.09; 95% CI: 0.71, 1.69) unplanned caesarean birth compared to controls (Table 4.12a).

4.2.12.1.12 Receive educational instructions about sporting during ANC visits

The distribution of the study population according to maternal receive of educational instructions from the nursing and midwifery team about sporting during ANC visits showed 141(81%) controls compared to 137 (80.5%) cases. Conditional logistic regression analysis showed that there was a significant association between mothers who hadn't received educational instructions about sporting during ANC visits and unplanned caesarean birth among mothers (p = 0.005). The odds of unplanned caesarean birth among mothers who hadn't received educational instructions about sporting during ANC visits were about 2 - fold (mOR: 1.84; 95% CI: 1.21, 2.8) unplanned caesarean birth compared to controls (Table 4.12a).

4.2.12.1.13 Types of sporting regimen/s that mothers were instructed at PHC

- **Deep breathing as the sporting regimen/s you were instructed at PHC**

The distribution of the study population according to mothers who hadn't deep breathing as sporting regimen/s you were instructed at PHC showed 24 (72.7%) controls compared to 22 (66.7%) cases. Conditional logistic regression analysis showed that there was no significant association between mothers who hadn't deep breathing as the sporting regimen/s you were instructed at PHC and unplanned caesarean birth among mothers (p = 0.593). The odds of unplanned caesarean birth among mothers had mothers hadn't deep breathing as sporting regimen/s you were instructed at PHC 0.75 - fold (mOR: 0.75; 95% CI: 0.26, 2.15) unplanned caesarean birth compared to controls (Table 4.12a).

- **Walking as sporting regimen/s you were instructed at PHC**

The distribution of the study population according to mothers who hadn't walked as sporting regimen/s you were instructed at PHC showed that 20 (60.6%) controls compared to 18 (54.5%) of cases. Conditional logistic regression analysis showed that there was no significant association between mothers who hadn't walked as sporting regimen/s you were

instructed at PHC and unplanned caesarean birth among mothers (p = 0.619). The odds of unplanned caesarean birth among mothers had mothers hadn't walked as sporting regimen/s you were instructed at PHC 1.0 - fold (mOR: 0.78; 95% CI: 0.29, 2.07) unplanned caesarean birth compared to controls (Table 4.12a).

– **Physioball exercise as sporting regimen/s you were instructed at PHC**

The distribution of the study population according to mothers who hadn't physioball exercise as sporting regimen/s you were instructed at PHC showed 29 (87.9) controls compared to 32 (97) cases. Conditional logistic regression analysis showed that there was no significant association between mothers who hadn't physioball exercise as sporting regimen/s were instructed at PHC and unplanned caesarean birth among mothers (p = 0.196). The odds of unplanned caesarean birth among mothers had mothers hadn't physioball exercise as sporting regimen/s you were instructed at PHC 4.41 - fold (mOR: 4.41; 95% CI: 0.47, 41.8) unplanned caesarean birth compared to controls (Table 4.12a).

Table (4.12b): Univariate analysis of Nursing implications and occurrence of unplanned caesarean birth

Variables	Categories	Cases (n=200) n (%)	Controls (n=200) n (%)	Statistical Analysis		
				mOR	95% CI	P-value
Did receive psychological support from nurses during antenatal visits?						
		N= 33	**N= 33**			
	Yes (Ref.)	15 (45.5)	17 (51.5)	1.0		
	No	18 (54.5)	16 (48.5)	1.27	0.48-3.35	0.623
Did receive educational health instructions about stress-relieving strategies during visits?						
	Yes (Ref.)	20 (60.6)	26 (78.8)	1.0		
	No	13 (39.4)	7 (21.2)	2.41	0.81-7.17	0.112
Do think that the nurses gave an optimal service during their visits at ANC?						
	Yes (Ref.)	31 (93.9)	31 (93.9)	1.0		
	No	2 (6.1)	2 (6.1)	1.0	0.13-7.55	1.000
Did receive special instructions from nurses about physical exercises during the labor process?						
	Yes (Ref.)	28 (84.8)	31 (93.9)	1.0		
	No	5 (15.2)	2 (6.1)	2.77	0.5-15.42	0.245
Which sporting regimen/s were instructed? (Select all that apply)						
		N= 200	**N= 200**			
Deep breathing	Yes (Ref.)	58 (29)	106 (53)	1.0		
	No	142 (71)	94 (47)	2.76	1.83-4.17	**0.000***
Physioball	Yes (Ref.)	11 (5.5)	21 (10.5)	1.0		
	No	189 (94.5)	179 (89.5)	2.02	0.94-4.3	0.070
Walking	Yes (Ref.)	75 (37.5)	98 (49)	1.0		
	No	125 (62.5)	102 (51)	1.6	1.07-2.39	**0.021***
Back massage	Yes (Ref.)	30 (15)	66 (33)	1.0		
	No	170 (85)	134 (67)	2.79	1.71-4.54	**0.000***
Did they think the number of nursing staff was enough to get ideal care on time?						
	Yes (Ref.)	176 (88)	185 (92.5)	1.0		
	No	24 (12)	15 (7.5)	1.68	0.85-3.31	0.132
Did they think the nurses have been given optimal services during the delivery process?						
	Yes (Ref.)	176 (88)	185 (92.5)	1.0		
	No	24 (12)	15 (7.5)	1.68	0.85-3.31	0.132
*P < 0.05: significant, P ≥ 0.05: not significant; **n:** number; mOR: matched odds ratio & CI: confidence interval						

– **Receive psychological support from nurses during antenatal visits**

The distribution of the study population according to mothers not receive psychological support from nurses during antenatal visits showed that 16 (48.5%) of controls compared to 18 (54.5%) of cases. Conditional logistic regression analysis showed that there is no significant association between mothers who do not receive psychological support from nurses during antenatal visits and unplanned caesarean birth among mothers (p = 0.623). The odds of unplanned caesarean birth among mothers who had not received psychological support from nurses during antenatal visits were 1.27 - fold (mOR: 1.27; 95% CI: 0.48, 3.35) unplanned caesarean birth compared to controls (Table 4.12b).

– **Receive educational health instructions about stress-relieving strategies during visits**

The distribution of the study population according to mothers who hadn't received educational health instructions about stress-relieving strategies during visits showed 7 (21.2%) controls compared to 13 (39.4%) cases. Conditional logistic regression analysis showed that there was no significant association between mothers who hadn't received educational health instructions about stress-relieving strategies during visits and unplanned caesarean birth among mothers (p = 0.112). The odds of unplanned caesarean birth among mothers who hadn't received educational health instructions about stress-relieving strategies during visits 2.0 - fold (mOR: 2.41; 95% CI: 0.81, 7.17) unplanned caesarean birth compared to controls (Table 4.12b).

– **Think that the nurses gave optimal service during their visits to ANC**

The distribution of the study population according to mothers hadn't thought that the nurses gave an optimal service during their visits showed that 2 (6.1%) of controls compared to 2 (6.1%) of cases. Conditional logistic regression analysis showed that there was no significant association between mothers who hadn't thought that the nurses gave optimal service during their visits and unplanned caesarean birth among mothers (p = 1.000). The odds of unplanned caesarean birth among mothers hadn't thought that the nurses gave an optimal service during their visits 1 - fold (mOR: 1; 95% CI: 0.13, 7.55) unplanned caesarean birth compared to controls (Table 4.12b).

– **Receive special instructions from nurses about physical exercises during the labor process**

The distribution of the study population according to mothers not receive special instructions from nurses about physical exercises during the labor process showed that 2 (6.1%) of controls compared to 5 (15.2%) of cases. Conditional logistic regression analysis showed that there is no significant association between mothers does not receive special instructions from nurses about physical exercises during the labor process and unplanned caesarean birth among mothers (p = 0.245). The odds of unplanned caesarean birth among mothers who had mothers not received special instructions from nurses about physical exercises during the labor process 3.0- fold (mOR: 2.77; 95% CI: 0.50, 5.42) unplanned caesarean birth compared to controls (Table 4.12b).

– **Deep breathing sporting regimens you were instructed**

The distribution of the study population according to mothers who hadn't deep breathing sporting regimens they were instructed showed 94 (47%) of controls compared to 142 (71%) of cases. Conditional logistic regression analysis showed that there was a significant association between mothers who hadn't deep breathing sporting regimens they were instructed on and unplanned caesarean birth among mothers (p = 0.000). The odds of unplanned caesarean birth among mothers had mothers hadn't deep breathing sporting regimens you were instructed 3 - fold (mOR: 2.76; 95% CI: 1.83, 4.17) unplanned caesarean birth compared to controls (Table 4.12b).

– **Physioball exercise sporting regimens you were instructed**

The distribution of the study population according to mothers who hadn't Physioball exercise sporting regimens you were instructed showed 179 (89.5%) controls compared to 189 (94.5%) cases. Conditional logistic regression analysis showed that there was no significant association between mothers who hadn't Physioball exercise sporting regimens were instructed and unplanned caesarean birth among mothers (p = 0.070). The odds of unplanned caesarean birth among mothers had mothers hadn't Physioball exercise sporting regimens you were instructed 2.02 - fold (mOR: 2.02; 95% CI: 0.94, -4.3) unplanned caesarean birth compared to controls (Table 4.12b).

– **Walking sporting regimens you were instructed**

The distribution of the study population according to mothers who hadn't walked sporting regimens 102 (51%) controls compared to 125 (62.5%) of cases. Conditional logistic regression analysis showed that there was a significant association between mothers who hadn't walked sporting regimens they were instructed and unplanned caesarean birth among mothers (p = 0.021). The odds of unplanned caesarean birth among mothers who hadn't

walked sporting regimens you were instructed 1.6 - fold (mOR: 1.6; 95% CI: 1.07, 2.39) unplanned caesarean birth compared to controls (Table 4.12b).

– **Back massage as sporting regimen/s you were instructed at ANC**

The distribution of the study population according to back massage as sporting regimen/s at ANC showed 66 (33%) of controls compared to 30 (15%) of cases were instructed by the nurses. Conditional logistic regression analysis showed that there was a significant association between lack of instruction about back massage as a sporting regimen/s and unplanned caesarean birth among mothers (p = 0.000). The odds of unplanned caesarean birth among mothers who hadn't back massaged as sporting regimen/s you were instructed at about 3 - fold unplanned caesarean birth (mOR: 2.79; 95% CI: 1.71, 4.54) compared to controls (Table 4.12b).

– **Think that the number of nursing staff was enough to get ideal care on time**

The distribution of the study population according to think that the number of the nursing staff was enough to get ideal care on time showed 185 (92.5%) controls compared to 176 (88%) cases. Conditional logistic regression analysis showed that there was no significant association between thinking that the number of nursing staff was enough to get ideal care and unplanned caesarean birth among mothers (p = 0.132). The odds of unplanned caesarean birth among mothers who hadn't Think that the number of the nursing staff was enough to get ideal care on time were instructed at about 2 - fold unplanned caesarean birth (mOR: 1.68; 95% CI: 0.85, 3.31) compared to controls (Table 4.12b).

– **Think that the nurses have been given optimal services during the delivery process**

The distribution of the study population according to think that the nurses have been given optimal services during the delivery process showed 185 (92.5%) controls compared to 176 (88%) cases. Conditional logistic regression analysis showed that there was no significant association between thinking that the nurses have been given optimal services during the delivery process and unplanned caesarean birth among mothers (p = 0.132). The odds of unplanned caesarean birth among mothers who hadn't thought the nurses have been given optimal services during the delivery process were instructed at about 2 - fold unplanned caesarean birth (mOR: 1.68; 95% CI: 0.85, 3.31) compared to controls (Table 4.12b).

4.2.13 Multivariate Result of Nursing Implications

Table (4.13): Adjusted matched odds ratio of nursing implications and unplanned caesarean birth

Variables	Categories	Model 1 [a]			Model 2 [b]		
		mOR	95% CI	P-value	mOR	95% CI	P-value
Have their instructed by sporting regimens during their pregnancy?							
	Yes (Ref.)	1.0			1.0		
	No	3.164	0.62-16.13	0.166	1.62	1.04-2.53	0.033
Instructed by sporting regimen during their pregnancy							
Deep breathing	Yes (Ref.)				1.0		
	No	0.316	0.06-1.61	0.166	1.68	0.71-4.02	0.240
Others	Yes (Ref.)	1.0			1.0		
	No	0.258	0.02-3.38	0.302	1.68	0.71-4.02	0.240
How many times did their visit the antenatal clinic during their last pregnancy? _____							
	1-3 times	3.880	0.3-50.9	0.302	2.12	1.34-3.35	0.001
	4-8 times	6.819	1.54-30.14	0.011	1.234	0.68-2.23	0.486
	9 times or more (Ref.)	1.0			1.0		
Have their received an explanation of the birth process in order to reduce their fear factor?							
	Yes (Ref.)	1.0			1.0		
	No	0.371	0.07-1.96	0.243	1.51	0.96-2.36	0.072
Did they have any instructions about their fetus's position before delivery?							
	Yes (Ref.)	1.0			1.0		
	No	0.000	0-15.0	0.999	1.34	0.85-2.11	0.201
Physioball exercise	Yes (Ref.)	1.0			1.0		
	No	0.316	0.03-3.34	0.338	0.97	0.28-3.43	0.966
Which sporting regimen/s were instructed?							
Deep breathing	Yes (Ref.)				1.0		
	No	0.695	0.06-7.66	0.766	0.67	0.2-2.3	0.525
Physioball exercise	Yes (Ref.)	1.0			1.0		
	No	4.147	0.42-40.84	0.223	1.21	0.09-15.49	0.886
Walking	Yes (Ref.)	1.0			1.0		
	No	4.147	0.42-40.84	0.223	0.86	0.29-2.58	0.790
Back massage	Yes (Ref.)	1.0			1.0		
	No	1.242	0.14-10.7	0.844	0.54	0.14-2.14	0.380
Others	Yes (Ref.)				1.0		
	No	0.381	0.03-4.77	0.454	0.94	0.18-5.03	0.942
Did they think the number of nursing staff was enough to get ideal care on time?							
	Yes (Ref.)	1.0			1.0		
	No	2.627	0.21-32.93	0.454	1.45	0.72-2.91	0.295
Did they think the nurses have been given optimal services during the delivery process?							
	Yes (Ref.)	1.0			1.0		
	No	1.49	0.75-2.98	0.255	1.44	0.72-2.9	0.306

mOR: matched odds ratio; **CI**: confidence interval.
[a] adjusted for all significant variables of sporting regimen at univariate p value <0.20.
[b] adjusted for demographic characteristics (Age, level of education, current social statues, husband career, mother c members and economic level of the family).

Multivariate conditional logistic regression was used to emphasize the earlier-mentioned results from Univariate analysis. Using stepwise backward selection, the Adjusted OR for unplanned caesarean birth was calculated. four factors were found to be independently significant predictors for increasing the likelihood of unplanned caesarean birth such as mother hadn't deep breathing Instructed by sporting regimen during their pregnancy, mother hadn't others instructed by sporting regimen during their pregnancy, mother had 1-3 times did their visited the ANC clinic during their last pregnancy, mother had 4-8 times did their visited the ANC clinic during their last pregnancy, mothers have received an explanation of the birth process to reduce their fear factor, mothers have theirs have any instructions about their fetus's position before delivery, mothers hadn't sported regimen/s there were instructed as Physioball exercise, Mothers hadn't sported regimen/s there were instructed as deep breathing , Mothers hadn't sported regimen/s there were instructed as physioball exercise , Mothers hadn't sported regimen/s there were instructions as walking, sporting regimen/s were instructed as back massage, Mothers hadn't others sporting regimen/s there were instructed as, mothers hadn't thought the number of nursing staff was enough to get ideal care on time and mothers hadn't thought the nurses have been given optimal services during the delivery process (Table 4.13).

4.2.14 Summary of Significant Results of all Study Variables at Multivariate Level

The significant findings from the multivariate analysis are summarized in Table 4.14. In order to identify the most important predicted variables for the unplanned CS derived from the current study, the significant related variables were ordered from the lowest odds ratio to the highest odds ratio.

Table (4.14): Summary of significant results of multivariate analysis

Variables	Categories	Model 1 a			Model 2 b		
		mOR	95% CI	P-value	mOR	95% CI	P-value
Gravida	Primigravida	1.5	(1.00-5.00)	0.52	0.93	0.5-1.71	0.815
	2-4 times (Ref.)	1			1		
	5 times or more	1.25	0.64-1.71	0.666	0.47	0.25-0.88	**0.018***
Para	Prime	2.04	1.28-3.24	0.003*	0.93	0.5-1.71	0.815
	2 to 4 times (Ref.)	1			1		
	5 times or more	0.76	(0.21-2.72)	0.673	0.47	0.25-0.88	**0.018***
Neonatal weight at delivery (gms)							
	< 2500 gms	0.15	(0.02-0.61)	**0.003***	0.63	(0.15-.82)	**0.000***
	≥ 2500 gms (Ref.)	1					
Mother's Hb. the level at delivery (mg/dl)							
	<11mg/dl (Anemia)	1.75	(1.13-2.72)	**0.013***	1.67	(1.1-2.55)	**0.017***
	≥11 mg/dl. (normal) (Ref.)	1			1		
Have you had a hard birth during their current delivery?							
	Yes	1.607	0.31-8.25	0.569	2.17	1.43-3.28	**0.000***
	No (Ref.)	1					
Mother's BMI instantly before pregnancy.							
	Normal weight (Ref.)	1			1		
	Underweight (<18)	2.32	(1.16-4.64)	**0.017***	2.28	(1.21-4.29)	**0.011***
	Overweight (25-29.9)	5.65	(1.35-23.59)	**0.018***	3.18	(0.97-10.37)	0.056
	Obese (>30)	2.42	(1.16-5.07)	**0.019***	2.45	(1.23-4.87)	**0.011***
Average pregnancy weight gain kgs							
	11.5 to16 (Ref.)	1			1		
	Less than 11.5	2.73	(1.21-6.19)	**0.016***	2.87	(1.27-6.46)	**0.011***
	More than 16	2.53	(1.17-5.48)	**0.019***	2.5	(1.15-5.4)	**0.020***
Since the beginning of pregnancy, have you felt anxiously in continuous manner?							
	Yes	1.56	0.78-2.25	0.023*	3.93	1.65-21.29	**0.006***
	No (Ref.)	1			1		
Gestational age at delivery (wks).							
	< 37wks.	6.65	(2.05-21.58)	**0.002***	4.31	(1.29-14.39)	**0.018***
	> 42 wks	0.99	(0.25-3.87)	0.986	0.54	(0.13-2.18)	0.388
	37- 42 wks (Ref.)	1			1		
How do you rate the level of psychological pressures you faced during your last pregnancy?							
	No	1			1		
	Mild	2.051	0.71-5.94	0.185	2.85	1.12-7.22	**0.027***
	Moderate	2.59	1.03-6.52	0.043	3	1.06-8.5	**0.038***
	Severe	4.238	2.01-8.11	0	4.31	2.2-9.33	**0.000***

Table (4.14): Continued

Physical exercise has been done at their delivery							
Deep breathing	Yes (Ref.)	1			1		
	No	1.414	0.59-3.36	0.433	2.43	1.15-5.17	**0.020***
Physioball exercise	Yes (Ref.)	1			1		
	No	8.075	0.5-129.3	0.14	4.79	0.53-43.66	0.165
Back massage	Yes (Ref.)	1			1		
	No	4.112	1.46-11.58	0.007	4.03	1.56-10.44	**0.004***
Multiple pregnancy	Twins (2 or more)	11.25	(0.97-	0.053	5.74	1.2-27.38	**0.028***
	One (Ref.)	1			1		
Did you have previous unplanned caesarean birth?							
	Yes	7.33	(2.96-18.17)	0.000	5.79	2.68-12.54	**0.000***
	No (Ref.)	1			1		
Did you expose yourself to domestic violence during your last pregnancy?							
	Yes	3.712	0.84-16.41	0.084	5.93	1.65-21.29	**0.006***
	No (Ref.)	1			1		
Current diagnosis							
Oligohydramnios	Yes	9.66	(0.95-98.27)	0.055	9.98	1.18-84.13	**0.035***
	No (Ref.)	1			1		
APH	Yes	10.38	(0.94-	0.056	9.35	1.12-77.78	**0.039***
	No (Ref.)	1			1		
Sporting regimen during their last pregnancy							
Physioball exercise	Yes (Ref.)	1			1		
	No	9.88	0.91-107.14	0.06	10.67	1.31-87.05	**0.027***
Walking	Yes (Ref.)	1			1		
	No	7.164	2.24-22.89	0.001	4.58	1.8-11.67	**0.001***
What is the fetal presenting part at delivery?							
	Cephalic (Ref.)	1			1		
	Shoulder/Breach	29.79	(2.95-	0.004	11.75	2.68-51.52	**0.001***
What was the fetal position in the last month of pregnancy?							
	Cephalic (Ref.)	1			1		
	Breach/ Transverse	13.3	(3.03-58.29)	0.001 *	11.96	2.71-52.72	**0.001***
Breech position	Yes	6.41	(1.11-36.98)	0.038 *	13.15	1.67-	**0.015***
	No (Ref.)	1			1		
Bad CTG	Yes	38.91	(12.63-119.89)	0.000 *	20.46	9.03-46.33	**0.000***
	No (Ref.)	1			1		

* Statistically significant

Chapter Five

Discussion

This part discusses the main results of this study and compares them with the findings of previous studies that investigate similar research problems and objectives.

5.1 Relationship between unplanned caesarean birth and sociodemographic characteristics

In this research, it was found that the young women under the age of 20 years old had about fourth-fold the likelihood of unplanned caesarean birth. A similar result was found in a previous study, in which women in the age group of 18 to 24 years old have a higher risk of unplanned caesarean birth (Sakala et al., 2020). On the other hand, it was also found that older women over 40 years had a higher risk for a planned and unplanned caesarean birth (Panda et al., 2022). According to the researcher, in our country of Palestine, the rate of marriage is high at the ages of less than 20 and more than 40. The first is that customs and traditions of the concept of early marriage still exist in our Arab society, with some variations between societies. The reason for the second remark is that the woman may have been widowed, as is common among women in Gaza as a result of Israeli aggression, and forced to marry at a later age, or that her marriage occurred at a later age, exposing her to unplanned CS, as the current study revealed.

Regarding maternal education level, the risk of having unplanned caesarean birth was three times more in lower-educated mothers less than 9 years compared to women with the highest education level, it was the same result in many studies, the lower educational level was found a statistically significant factor for an unplanned caesarean birth (Sakala et al., 2020) and (Goossens et al., 2016). Also, the results of this study demonstrate that there was a statistically significant association between the separated social status of the women and the unplanned caesarean birth. Goossens et al. (2016) agree with our results which illustrate that single women had higher chances of having unplanned caesarean birth in comparison with married women.

Moreover, unemployed mothers had a higher risk of unplanned caesarean birth according to the results of this study, while it was found in another study that employed women had a higher risk of unplanned caesarean birth (Muhammad et al., 2022). The same as, similar to

our results the study of Miani et al. (2020) demonstrated that women with low income are more likely to have unplanned caesarean birth than those with higher income. Additionally, the study clarifies the existence of a statistically significant association between mothers who have family members with more than six children and unplanned caesarean birth, and also a significant relationship between mothers with family members from four to six and unplanned caesarean birth. As, a bit similar study conducted by Muhammad et al. (2022) illustrated the same aspect as having more than three children, having fewer chances of unplanned caesarean birth.

In our Arab and Islamic societies, a woman who lives alone is one whose husband has died, who is divorced, or whose husband has traveled while she is pregnant. All of these factors influence a woman's hormones during her pregnancy, particularly in the last month, as the presence of these hormones aid in the normal birth process. The fact that the homeowner or mother does not work reduces economic income, increases psychological stress and stress, burdens the pregnant woman, and diverts her attention away from caring for herself and her fetus. The same is true for those who have children aged 4 to 6.

5.2 Maternal and neonatal somatic characteristics

The univariate analysis showed that there were statistically significant associations between unplanned caesarean birth and obese women (BMI more than 30), women of stature less than 150 cm, weight gain more than 16 kg during the pregnancy, anemic women (Hb less than 11), gestational age of fewer than 37 weeks and more 42 weeks, and neonatal weight of less than 2500 gm. Multivariate results showed significant associations between unplanned caesarean birth and underweight women of BMI less than 18 and obese women of BMI more than 30, with weight gain of fewer than 11.5 kg and more than 16 kg, with a preterm gestational age of fewer than 37 weeks, and with a neonatal weight of fewer than 2500 gm. A study of Panda et al., (2022) demonstrated that women who were overweight with a BMI of 25 to 30 have a higher risk for unplanned caesarean birth Another study showed that overweight and obese women had a statistically significant association with unplanned caesarean birth (Muhammad et al., 2022). In contrast, it was found that women with underweight (BM less than 18) had a higher risk of unplanned caesarean birth (Irwinda et al., 2021). A significant association was found between women with a height of less than 150 cm and unplanned caesarean birth. It was proved previously that, maternal height was inversely associated with unplanned caesarean birth (Fischer et al., 2020).

The conditional logistic regression analysis of Irwinda et al. (2021) study showed a significant association between mothers having an average pregnancy weight gain of more than 16 kgs and C- section delivery among mothers, as it was previously should that excessive weight gain was associated with an increased risk of unplanned caesarean birth. The same as a previous research has shown anemia to be significantly associated with emergency C-section births (Chu et al., 2020). It also found in a study that gestational age <37 weeks had a significant association with unplanned caesarean birth (Irwinda et al., 2021). Additionally, in contrast to this study results of Irwinda et al. (2021) illustrated that a neonatal weight higher than 3500 grams was associated with unplanned caesarean birth. Also, many studies showed that extreme birth weight was more likely to be associated with an increased risk of unplanned caesarean birth, contrary to the findings of this study (Tarimo et al., 2020 ; Al Busaidi et al., 2012). According to the researcher, the reason could be that women post-delivery are not well prepared to answer the questionnaire correctly, or that her health status prevents her from knowing her child's situation, weight, and what needs to be known.

The researcher also discovers that the low hemoglobin ratio in society is caused by a lack of a healthy pregnancy pattern and the frequent consumption of tea, soft drinks, and chocolate, which inhibits iron absorption, all of which have an impact on the growth and measurements of the lady's body, which has a negative impact on the type of birth. In this case, the woman can overcome the increase in body measurements by engaging in a sports program while pregnant. The researcher goes on to say that pregnant women in our society prefer to rest and sit because they believe it helps to maintain the pregnancy, which affects the outcome of the birth.

According to the researcher point of view, the prevalence of BMI among pregnant women in our society is high due to a lack of a healthy lifestyle, particularly in the first and last trimesters of pregnancy. The lady focuses on carbohydrates, which increase weight, affecting the birth process and its facilitation.

5.3 Previous obstetrical history

Univariate analysis revealed that oligohydramnios, preeclampsia, APH, a bad fetus's CTG, breech position, obstructed labor, multiple fetuses, primigravida, prima para, a short duration between births of less than 2 years, and a previous unplanned caesarean birth were predictors of an unplanned caesarean birth. Furthermore, multivariate analysis revealed that

oligohydramnios, APH, low CTG, breech position, multiple fetuses, five or more pregnancies, five or more paras, and a previous unplanned caesarean birth remained independently related to an unplanned caesarean birth. Similarly, Rabie et al. (2017) discover a link between oligohydramnios and unplanned caesarean birth among mothers. Similarly, Nankali et al. (2013) show a link between preeclampsia and unplanned caesarean delivery.

There is a significant association between the current diagnosis of a bad CTG and unplanned caesarean birth among mothers, according to conditional logistic regression analysis. There was also a significant link between the current breech position diagnosis and an increased risk of an unplanned caesarean birth. This finding is consistent with the findings of a previous study, which found an increased risk of unplanned caesarean birth with a diagnosis of breech position (Panda et al., 2022), as well as non-cephalic presentation (Irwinda et al., 2021). The current diagnosis of obstructed labor was statistically associated with an increased risk of unplanned caesarean birth; Abebe et al. (2015) reported the same result. The findings of this study, on the other hand, showed that polyhydramnios had no statistically significant association with unplanned caesarean birth, whereas Aviram et al. (2015) and Yefet & Daniel-Spiegel (2016) did not agree with us and confirmed that polyhydramnios increases the risk of unplanned caesarean birth. Similarly, the study's conditional logistic regression analysis found no significant link between current placenta previa diagnosis and unplanned caesarean birth. Previous studies have linked placenta previa to unplanned caesarean birth (Palacios-Jaraquemada, 2013; Jauniaux & Bhide, 2017). This could be explained by the small size of our sample in comparison to other studies.

Furthermore, no significant relationship was found between the current PROM diagnosis and the incidence of unplanned caesarean birth among mothers. Previous studies have also found no link between PROM and unplanned caesarean birth (Irwinda et al., 2021; Al Riyami et al., 2013). Similarly, to chorioamnionitis, this study found no statistically significant link between chorioamnionitis and unplanned caesarean birth, whereas Zackler et al. (2019) agreed that chorioamnionitis increases the risk of unplanned caesarean birth. This may be explained by the small size of our sample in comparison to other studies.

Among the significant findings was a link between the current diagnosis and the number of current fetuses, as well as unplanned caesarean births. The previous study found no significant relationship between having twins and having an unplanned caesarean birth (Irwinda et al., 2021). In terms of gravida, being primigravida was associated with unplanned caesarean birth, but there was no association between having five or more gravida and

unplanned caesarean birth. A study also found a significant link between primigravida and unplanned caesarean birth (Irwinda et al., 2021), while another found a link between multiple pregnancies and an increased risk of unplanned caesarean birth (Panda et al., 2022). Another significant association was discovered between the prime para and the risk of unplanned caesarean birth, but multiple paras occurring more than five times did not have an association with an increased risk of unplanned caesarean birth. Previously, it was discovered that there was a significant association between having more than two paras and having an unplanned caesarean birth (Sakala et al., 2020).

There was a significant association between unplanned caesarean birth and a time difference of less than two years between the current and previous pregnancies. Less than 18 months between births increases the risk of placenta previa and placental abruption, which increases the risk of an unplanned caesarean birth (Ye et al., 2019). Furthermore, a statistically significant link existed between previous caesarean birth and unplanned caesarean birth. It has previously been demonstrated that a previous caesarean birth was a risk factor for an unplanned caesarean birth, particularly if the previous caesarean birth was not indicated (Antoniou et al., 2020). There is also a link between safe transfer to the hospital and unplanned caesareans among mothers. A previous study found that transfer to the hospital was not a risk factor or predictor of unplanned caesarean birth (Sakala et al., 2020).

5.4 Antenatal care visits

The univariate analysis revealed significant associations between unplanned caesarean birth and government clinic follow-up, beginning ANC visits during the first trimester, breech presentation during the last month, and not discussing pregnancy issues with the husband. The multivariate analysis revealed a link between unplanned caesarean birth and breech presentation in the third trimester.

Following up on the previous pregnancy in governmental clinics was statistically associated with unplanned caesarean birth, but there was no significant relationship between following up on the previous pregnancy in non-governmental clinics and unplanned caesarean birth, according to the findings. Furthermore, there was a statistically significant relationship between starting to visit an ANC clinic during the current pregnancy in the second trimester and unplanned caesarean birth among mothers, whereas there was no statistically significant relationship between visiting an ANC clinic during the current pregnancy in the third trimester and unplanned caesarean birth. Previous ANC research has found no link between

starting or increasing the number of antenatal visits and unplanned caesarean birth (Sakala et al., 2020).

There is no link between previous pregnancy recurrent vaginal bleeding and unplanned caesarean birth among mothers. Previously, it was discovered that vaginal bleeding increased the risk of unplanned caesarean birth, particularly in cases of placenta previa (Pivano et al., 2015).

There was no statistically significant link found between a history of chronic diseases like hypertension or diabetes mellitus and unplanned caesareans. While it had previously been discovered that there was a significant association between a history of chronic diseases such as hypertension and unplanned caesareans, the risk would increase with advanced age (Janoudi et al., 2015). Furthermore, having any health problem related to the previous pregnancy, such as PIH or pre-eclampsia, was associated with having an unplanned caesarean among women. A previous study, on the other hand, discovered that having pregnancy-related health issues, such as gestational diabetes or gestational hypertension, was statistically significantly associated with unplanned caesarean birth (Stern et al., 2018). There was a significant link found between breach or transverse fetal position in the last month of pregnancy and unplanned caesarean birth among mothers. Previous research found no link between previous breech presentation and unplanned caesarean birth in the current pregnancy (Sakala et al., 2020).

There was a significant link between not discussing the pregnancy with their husband and unplanned caesareans among mothers. While there was no significant link found between discussing the pregnancy issue with their husband and unplanned caesarean birth among mothers. Concerning the desire to become pregnant, no significant association was found between the desire to become pregnant and unplanned caesarean birth; similarly, the non-desire to become pregnant had no significant association with unplanned caesarean birth. Desire to become pregnant was a statistically significant predictor of unplanned caesarean birth more than unplanned caesarean birth (Karlström et al., 2011). Furthermore, prior pregnancy history revealed a significant link between taking any steps to terminate the pregnancy and unplanned caesarean birth among mothers. The pregnant woman also discusses the pregnancy issue with her husband or does not have a close connection with the occurrence of emergency caesarean section, the researcher believes that this issue may affect the good relationship and mutual support between the spouses if it is not done, and thus negatively affects the pregnant woman's psyche.

5.5 Sporting regimen among cases and controls

The univariate analysis revealed that not doing deep breathing exercises, physiotherapy ball exercises, and back massage during the previous pregnancy, as well as not doing deep breathing exercises, back massage, and other sports during pregnancy, were risk factors for unplanned caesarean birth. The multivariate analysis revealed that the factors were not walking, not doing physio ball exercises, not getting a back massage during the previous pregnancy, and not getting a back massage during the pregnancy.

In terms of sporting regimen during pregnancy, no statistically significant link was found between doing sports less than twice per week or not doing any sport at all and unplanned caesareans. It had previously been demonstrated that there was a significant link between unplanned caesarean birth and inactive pregnant women (Misan et al., 2022). In addition, regular exercise and high-impact exercises during pregnancy have been linked to a lower risk of having an unplanned caesarean birth in first-time mothers (Owe et al., 2016). This study discovered a link between no deep breathing sports regimen during their previous pregnancy and unplanned caesarean birth among mothers. Previously, it was reported that mothers who did not participate in a physio ball exercise sporting regimen during their previous pregnancy were more likely to have an unplanned caesarean birth. Physio ball exercise has been shown to promote vaginal birth more than unplanned caesarean birth (Mirzakhani et al., 2015). There was also a connection between not walking during the previous pregnancy and an unplanned caesarean birth. Previous associations have found a significant link between walking and a lower risk of unplanned caesarean birth (Shojaei et al., 2021).

There was a statistically significant association between not having back massages during pregnancy and unplanned caesareans. The literature supporting the use of massage during pregnancy and labor is limited; however, evidence supporting its use has grown over the last 30 years. Massage has been shown to help pregnant women suffering from anxiety, depression, leg and back pain, and significant improvements in pain perception during labor (Pachtman Shetty & Fogarty, 2021). However, the study found no significant association between starting the sports regimen in the second trimester and unplanned caesarean birth, and there was no significant association between starting sports in the third trimester and unplanned caesarean birth. Furthermore, there is no significant link between starting sports before delivery and unplanned caesareans in women. Previous research found that increasing

physical activity reduced the likelihood of an unplanned caesarean birth, with statistically significant trends at all four-time stages except the third trimester (Nielsen et al., 2017).

In this study, the conditional logistic regression analysis found no significant relationship between extended exercise (less than 10 minutes or more than 20 minutes) and unplanned caesarean birth among mothers. A similar study discovered that the duration, intensity, frequency, or volume of sport had no statistically significant association with unplanned caesarean birth (Davenport et al., 2019).

This study found that not performing deep breathing exercises during labor is a significant predictor of an unplanned caesarean birth. Another study found that deep breathing exercises reduced pain after a relaxing exercise but that not doing these exercises was not a risk factor for unplanned caesarean birth (Kusmiran et al., 2018). There was no statistically significant link found between those who did not engage in physiotherapy ball exercise and unplanned caesareans. As previously stated, physio ball exercise promotes vaginal delivery over unplanned caesareans (Mirzakhani et al., 2015). Furthermore, there was a significant association between those who had not walked and unplanned caesareans. Walking and physical activity have been shown to improve vaginal delivery and lower the risk of unplanned caesareans (Li et al., 2014). Moreover, it was discovered that there is a significant association between having no back massage and having an unplanned caesarean among mothers. Massage was beneficial to pregnant women suffering from back pain during labor, according to previous research (Pachtman et al., 2021). Furthermore, the study found a link between not having other exercises done during labor and having an unplanned caesarean birth. Previous research has found that regular exercise reduces the risk of an unplanned caesarean birth (Owe et al., 2016).

The multivariate analysis revealed that the following factors had a significant association with unplanned caesarean birth: mothers had not done deep breathing, physio ball exercise, walking, back massage, or physical exercise at their delivery, as well as not done deep breathing, physio ball exercise, walking, and back massage. Previous research has shown that inactivity during pregnancy increases the risk of unplanned caesarean birth (Misan et al., 2022), whereas regular exercise and sports during pregnancy reduce the risk of unplanned caesarean birth (Owe et al., 2016). The researcher attributes the lack of exercise in our society among pregnant women to the fact that it is a new concept that needs to be disseminated, raised awareness, and educated about.

5.6 Psychological and social stressors during pregnancy

According to the univariate analysis, unplanned caesarean birth had significant relationships with all levels of mental pressure during pregnancy, domestic violence, and facing a difficult birth process. According to the study's findings, mothers who experienced mild psychological stress during their previous pregnancy had a statistically significant association with unplanned caesarean birth. The presence of moderate or severe psychological pressure during pregnancy was linked to an unplanned caesarean birth. According to the findings of this study, maternal psychological stress during pregnancy was significantly associated with unplanned caesarean birth. Consistent result was found in a previous study which showed that poor mental health and depression during pregnancy were found to be significantly associated with an increased risk of unplanned caesarean birth (Moameri et al., 2019).

The study found a link between exposure to domestic violence during the previous pregnancy and unplanned caesareans among mothers. A previous study found that a history of domestic violence during pregnancy increases the risk of having an unplanned caesarean birth (Enomoto et al., 2016). Pregnancy outcomes based on pre-pregnancy body mass index in Japanese women. Another study discovered that domestic and sexual violence were risk factors for unplanned caesarean deliveries (Henriksen et al., 2014). It was discovered that there is a statistically significant link between mothers who had a difficult birth during their most recent delivery and mothers who had an unplanned caesarean birth. It has previously been stated that having a difficult birth increases the risk of an unplanned caesarean birth (Sung & Mahdy, 2022). Furthermore, no statistically significant relationship was found between the feeling of safety within the family since the beginning of pregnancy and unplanned caesarean sections. Previously, it was discovered that continuous support from family members and feelings of safety had a significant association with a decrease in unplanned caesarean births (Wang et al., 2018). According to conditional logistic regression analysis, there is no significant relationship between mothers living with their husband's family improving their psychological state during pregnancy and mothers having an unplanned caesarean birth.

Furthermore, the study found link between mothers anxious during their previous pregnancies and unplanned caesareans. Previous research found that anxiety during the

previous pregnancy was associated with induction of labor and planned unplanned caesarean births rather than unplanned caesarean births (Koelewijn et al., 2017).

According to the multivariate analysis, unplanned caesarean birth was significantly associated with all levels of psychological pressure during pregnancy, domestic violence, a difficult birth process, a previous negative pregnancy or delivery experience, and an unwanted child. Previous research found that a bad delivery experience, an unwanted child, fear of childbirth, and domestic violence were significantly associated with an increased risk of unplanned caesarean birth (Amini et al., 2018; O'Donovan & O'Donovan, 2018). Indeed, because there is a close correlation between the terms psychological, physical, and social health, and both of them affect the other, the psychological aspect has a significant role to play in influencing a pregnant woman's psyche if she is affected.

5.7 Nursing implications among cases and controls

According to the univariate analysis, unplanned caesarean birth was associated with mothers not being instructed by sports regimens during pregnancy, the number of ANC visits, not being instructed in deep breathing, not being instructed in walking, and not being instructed in back massage. There was no significant link found between mothers who did not receive nursing ANC during their previous pregnancy in primary care centres and unplanned caesarean birth among mothers. It had previously been stated that receiving nursing ANC was significantly associated with a lower risk of unplanned caesarean birth (Butler et al., 1993). There was a significant link discovered between mothers who were not instructed by sporting regimens during their pregnancy and unplanned caesarean birth among mothers. Previously, it was stated that regular exercise during pregnancy was a protective factor against unplanned caesareans (Owe et al., 2016). Furthermore, this study's findings revealed a significant link between mothers who did not receive deep breathing instruction from a sporting regimen during their pregnancy and unplanned caesarean birth among mothers. It was previously discovered that instruction in deep breathing exercises had a significant association with a lower risk of unplanned caesarean birth (Kusmiran et al., 2018). However, the study found no link between mothers who did not engage in any form of the significant association during their pregnancy and unplanned caesareans, while waking was previously declared to have a significant association with a lower risk of unplanned caesarean birth (Shojaei et al., 2021). There was also no statistically significant link between mothers who did not participate in physiotherapy or sports during their pregnancy and unplanned

caesarean birth. Physio ball exercises were found to have a significant association with reducing unplanned caesarean birth in a previous study (Mirzakhani et al., 2015). According to the findings, there was no significant association between mothers who did not engage in back massage sports regimens during their pregnancy and unplanned caesarean birth among mothers. Previously, back massage was declared to reduce leg pain, depression, and anxiety, as well as to help reduce labor pain, but there was little correlation between back massage and a lower risk of unplanned caesarean birth (Pachtman et al., 2021).

There was also no significant link found between mothers who did not participate in other sports during their pregnancy and unplanned caesareans among mothers. Regular exercise and high-impact exercises during pregnancy are associated with a lower risk of having an unplanned caesarean birth when compared to non-exercisers (Owe et al., 2016). The study found no link between mothers having an unplanned caesarean and not receiving comprehensive nursing care through visits. Previous research discovered that, while comprehensive nursing care delivered through visits was not statistically significant in terms of unplanned caesarean birth, it was more significant in terms of avoiding unplanned caesarean birth (Simpson & Lyndon, 2017). There was a link between mothers visiting the antenatal clinic 1-3 times during their previous pregnancy and having an unplanned caesarean birth. It was also found that there is a significant association between the 4–8 times mothers visited the antenatal clinic during their last pregnancy and unplanned caesareans. Previous research found no link between the number of antenatal visits and the risk of an unplanned caesarean birth (Sakala et al., 2020).

The study discovered a link between mothers who did not receive an explanation of the birth process to reduce their fear factor and unplanned caesarean birth. Previous research found that knowledge and information about the birth process helped reduce the fear factor and had a significant association with lowering the risk of unplanned caesarean birth (Deng et al., 2014). The study discovered no link between unplanned caesarean birth and mothers who were not informed about their fetus's position prior to delivery. It has previously been demonstrated that education and support about the position of the fetus can reduce the rates of unplanned caesareans (Caughey et al., 2014). Furthermore, no significant link was discovered between mothers who did not have health care providers introduce themselves during service and unplanned caesarean birth. It has previously been demonstrated that physicians and nurses generally have positive attitudes toward the benefits of gentle caesarean techniques; however, there is limited literature on the effect of healthcare identity

on mode of delivery choice (Mercier & Durante, 2018). The study found no significant link between mothers who did not receive an explanation about procedures or services performed during nursing care and unplanned caesareans. There was no significant association found between not receiving information or explanations about procedures or services performed during nursing care (Deng et al., 2014).

Furthermore, no statistically significant link was found between mothers who did not receive sports association during ANC visits and unplanned caesarean birth. As previously stated, it was discovered that instruction of a regular regimen of sport during pregnancy was a protective factor against unplanned caesareans (Owe et al., 2016).

According to the conditional logistic regression analysis, there is no significant link between mothers who did not follow the sporting regimen taught at PHC and unplanned caesarean birth. As previously reported, instruction in deep breathing exercise had a significant association with a lower risk of unplanned caesarean birth (Kusmiran et al., 2018). The study's findings revealed that there was no significant link between mothers who did not participate in the PHC's walking association and unplanned caesareans. Previous research has found that walking and regular sport participation are protective factors against unplanned caesarean birth (Shojaei et al., 2021). The study found no link between unplanned caesarean birth and mothers who did not participate in physiotherapy exercise as part of their sporting regimen at PHC. Previous research found no link between physiotherapy instruction at a PHC and unplanned caesarean birth (Mirzakhani et al., 2015). The study found no significant link between mothers who did not follow the regimen they were taught at PHC and unplanned caesarean births. Sport regimen instruction, as previously stated, had a significant association with facilitating vaginal birth rather than unplanned caesarean birth (Owe et al., 2016). The conditional logistic regression analysis revealed that there is no significant association between mothers who do not receive psychological support from nurses during antenatal visits and mothers who have an unplanned caesarean birth. Previous research has shown that psychological support from nurses during ANC visits improves vaginal delivery (Moameri et al., 2019). The study found no statistically significant link between unplanned caesareans and mothers who did not receive educational health instructions about stress-relieving strategies during visits. Previously, Wang et al. (2018) discovered that not receiving educational health instructions about stress-relieving strategies during visits was not statistically significantly associated with unplanned caesarean birth. The study found no significant link between mothers who did not believe the nurses provided

excellent care during their visits and unplanned caesareans. A previous study found that nurses spent approximately 7–9% of their time providing supportive care to laboring women (Gagnon & Waghorn, 1996). The study discovered no statistically significant link between mothers who did not receive special instructions from nurses about physical exercises during labor and unplanned caesarean birth. Previously, it was stated that there was no significant link between special labor instruction and an increased risk of unplanned caesarean birth (Owe et al., 2016). This study discovered a link between unplanned caesarean births and mothers who did not follow the deep breathing sports regimens they were taught. As previously revealed, instruction in deep breathing exercise had a significant association with a lower risk of unplanned caesarean birth (Kusmiran et al., 2018). The study discovered no link between mothers who were not instructed on physio ball exercise sporting regimens and unplanned caesarean birth. Previous research found no significant association between physiotherapy instruction at PHC and unplanned caesarean birth (Mirzakhani et al., 2015). The conditional logistic regression analysis revealed a significant link between mothers who did not follow their instructed sporting regimens and caesarean deliveries. Walking, as previously stated, favors vaginal delivery over unplanned caesarean birth (Shojaei et al., 2021). The findings of the study revealed a significant link between mothers who had not been instructed on back massage sporting regimens and unplanned caesarean birth among mothers. Previously, there was no significant association between back massage sports instruction and a reduction in unplanned caesarean births (Pachtman et al., 2021).

A statistically significant association was found between unplanned caesarean birth and mothers who had 4-8 antenatal visits in their previous pregnancy, according to the multivariate analysis. Previous research demonstrated that the number of antenatal visits during the previous pregnancy had no statistically significant association with an unplanned caesarean birth (Sakala et al., 2020).

The researcher proceeds to discuss the role of a nurse or midwife, from the prenatal care period to the postnatal care, as demonstrated by the woman's pregnancy. I completely agree with previous studies that support the findings of the current research in emphasizing the nurse's effective role. However, the results revealed some of the nurse's achievements that have an effective effect, as well as the trend of the pregnant woman, such as not giving advice and guidance to the pregnant woman, such as sports to be practiced during pregnancy and childbirth and preparing for childbirth, but from the researcher’ point of view, the role of the nurse or midwife is very effective and may contribute in preventing the occurrence of emergency caesareans, although some studies deny that.

Chapter Six

Conclusion and recommendations

6.1 Conclusion

The study has investigated many important factors associated with unplanned caesarean birth, including demographic variables, maternal and neonatal somatic characteristics, previous obstetrical history, previous ANC, sporting regimen, psychological and social stressors during pregnancy, and nursing implications. unplanned caesarean birth was associated with an underweight mother with a BMI of less than 18, an obese mother with a BMI of more than 30, a weight gain of less than 11.5 kg, a weight gain of more than 16 kg, a preterm gestational age of less than 37 weeks, and a newborn weight of less than 2500 gm.

Certain conditions, such as breech position, prima para, bad CTG, fewer than two years between pregnancies, and previous unplanned caesarean birth, were found to increase the odds of unplanned caesarean birth. In addition, there was a strong correlation between unplanned caesarean birth and ANC in the third trimester and breech presentation in the last month of pregnancy. In addition, the absence of deep breathing, physio ball exercise, walking, back massage, and physical exercise during labor is significantly associated with unplanned caesarean birth. Furthermore, it was shown that domestic violence, a difficult birthing procedure, a negative prior pregnancy or delivery experience, and an unwanted pregnancy raise the probability of unplanned caesarean birth.

6.2 Recommendations

The recommendations resulting from this study pertain to controllable factors associated with unplanned caesarean birth. However, some uncontrollable aspects linked with unplanned caesarean birth were omitted from the part of recommendations. These characteristics include, but are not limited to, work status, economic level, maternal height, and the existence of certain diseases.

6.2.1 Recommendations for women and their families

- Carefully plan for pregnancy and to limit pregnancies after the age of four as much as possible.

- Promote women's education to expand their knowledge of family planning, and ANC.
- Women should prioritize vegetables and fruits in their diets to maintain a healthy weight before and during pregnancy,
- Pregnant women should maintain a normal Hb level
- Women should engage in everyday physical activity during pregnancy.
- The family must protect pregnant women from violence
- To ensure women's mental health during pregnancy

6.2.2 Recommendations for Healthcare providers

- To encourage two-year pregnancy planning to limit the possibility of unplanned caesarean birth.
- To encourage pregnant women to engage in any form of physical activity.
- Advice to repeat CTG every 2 weeks if necessary and then every 7 days.
- Close monitoring of women with bad CTG by the nurse.

6.2.3 Recommendations for future research

- Conduct more detailed studies related to reproductive age, a previous infection, and incidence of unplanned caesarean birth.
- Preferably in future research, the sample can be drawn from all governorates of the Gaza Strip not only the southern cities to make the study more generalizable and representative.
- Increase the size of the sample to overcome small events that could occur in some variables.

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Annexes

Annex (1): Palestine map

Annex (2): Gaza Strip map

Annex (3): The Robson Ten Group Classification System

Group	Description
1	Nulliparous, singleton, cephalic, full-term, spontaneous labour.
2	Nulliparous, singleton, cephalic, full-term, induced labour or prelabour unplanned caesarean birth.
3	Multiparous, singleton, cephalic, full-term, without a previous unplanned caesarean birth, spontaneous labour
4	Multiparous, singleton, cephalic, full-term, without a previous uterine scar, induced labour or prelabour unplanned caesarean birth.
5	Multiparous, singleton, cephalic, full-term, with a previous unplanned caesarean birth.
6	Nulliparous, singleton, breech.
7	Multiparous, singleton, breech.
8	Multiple pregnancy (twins or higher-order multiples).
9	Singleton, transverse or oblique lie.
10	Singleton, cephalic, preterm

Annex (4): Complications occurring during or after unplanned caesarean birth

Complication	Incidence	Avoidance	Treatment
Postpartum Hemorrhage	Approx 5%	1. Antenatal diagnosis of abnormal placentation / fibroids, etc. 2. Meticulous surgical technique	1. Uterotonic agents 2. Prompt surgical repair 3. Balloon tamponade 4. Compression sutures 5. Uterine devascularisation 6. Interventional radiology 7. Hysterectomy
Sepsis	Wound (6.8–9.7%) Endometritis (3.9–18.4%)	1. Antibiotics prior to skin incision. 2. Vaginal decontamination. 3. Meticulous haemostasis. 4. Appropriate use of abdominal/ wound drains	1. Antibiotics. 2. Radiological drainage 3. Wound exploration / debridement. 4. Re-laparotomy, debridement, wash-out.
Bladder injury	Approx 0.1%	1. Careful peritoneal entry. 2. Avoiding bladder flap creation. 3. Avoiding excessively low uterine incision	1. Surgical repair. 2. Consider possibility of ureteric damage. 3. Bladder drainage. 4. Cystogram 10–14 days later
Ureter injury	Approx 0.4%	1. Correct for dextro-rotation prior to uterine incision. 2. Caution when repairing extensions and operating near broad ligament. 3. Caution when repairing bladder injuries	1. Urology opinion. 2. Ureteric occlusion: i. Suture removal ii. Ureteric stenting iii. Nephrostomy 3. Ureteric transection: i. Re-anastomosis. ii. Re-implantation
Bowel injury	-	1. Careful peritoneal entry. 2. General surgical assistance if extensive previous surgery. 3. Exteriorisation when suturing near broad ligament	1. General surgical assistance. 2. Primary repair. 3. Resection and stoma formation
Postoperative ileus	Approx. 12%	1. Careful bowel handling.	1. Exclusion of more serious pathology.

		2. Chewing gum postoperatively	2. IV fluid replacement. 3. Correction of electrolytes. 4. Anti-emetics. 5. Gastric drainage. 6. Minimize opiates
Ogilvie syndrome			1. As for postoperative ileus. 2. Urgent surgical review. 3. Consideration of neostigmine. 4. Rectal flatus tube 5. Laparotomy

Annex (5): Sample size calculation

N= Population Size	17048
n= Sample size	376

$$n = \frac{Np(1-p)}{(N-1)(d^2/z^2) + p(1-p)}$$

N= Population size

n= The optimal number of sample size

p= Probability value (50%)

d= Error proportion (0.05)

Annex (6): Study tool- English version

Questionnaire for study

Factors and Nursing Implications Associated with Unplanned Cesarean Births in South Governmental Hospitals of Gaza Strip: A Case-Control Study

Serial number		☐ **Unplanned cesarean delivery (case)**
		☐ **Vaginal delivery (control)**

Direction: Mark the response that best describes you in the bellows:

Domain I: Socio-demographic characteristics of the mother.				
Hospital (matching)	☐ Al Tahrer	☐ Al Emaraty		
Age …… years	☐ < 20	☐ 20-24	☐ 25-30	☐ >30
Residency	☐ Camp	☐ Village	☐ City	
Level of education	☐ Primary or less	☐ Preparatory	☐ Secondary	
	☐ Bachelor	☐ Higher education		
Current social statues	☐ Married	☐ Others as: (☐ Divorced ☐ widow ☐ separated)		
Father career	☐ Employed	☐ Unemployed		
Mother career	☐ Employed	☐ Unemployed		
Family members	…….			
Level of income	.....shekels.			
Economic level of the family	☐ ☐>1974 NIS poor	☐ ☐1974-2470 NIS under poverty line	☐ ☐ ≤1974 NIS	

Domain II: Maternal and neonatal Somatic Characteristics				
1.	Mother's weight instantly before pregnancy.	…… kgs.		
2.	Mother's weight at delivery	……. kgs.		
3.	Average pregnancy weight gain ……. kgs	☐ <11.5	☐ 11.5-16	☐ >16
4.	Mother's height ……cms.	☐ <150	☐ ≥150	
5.	Mother's BMI	……. kgs/m^2 (calculated by the researcher)		
6.	Mother's Hb. level at delivery…….mg/dl	☐ <11mg/dl (Anemia)	☐ ≤11 mg/dl. (normal)	
7.	Gestational age at delivery... ... wks.	☐ < 37wks.	☐ 37- 42 wks	☐ > 42 wks
8.	Neonatal weight at delivery…. gms	☐ < 2500 gms	☐ ≥ 2500 gms	

Domain III: Previous obstetrical history			
9.	Mother's medical diagnosis	……. (patient's file)	
10.	Number of current fetuses	☐ One	☐ Twins (2 or more)
11.	Gravida ……	☐ Primigravida ☐ 5 times or more	☐ 2-4 times
12.	Para ……. (Including abortion after 24 wks.)	☐ Prime (Skip Q.13-14) ☐ 5 times or more	☐ 2-4 times
13.	Duration between last pregnancy and the previous delivery? …… year/s	☐ <1 year ☐ >3 years or more	☐ 1-2 year
14.	Did you have previous C.S?	☐ Yes (number of C.S ……...)	☐ No
15.	What is the fetal presenting part at delivery?	☐ Cephalic ☐ Breach	☐ Shoulder
16.	Did you safely transfer to the hospital?	☐ Yes	☐ No
Domain IV: Antenatal care			
17.	Where did you follow up in the last pregnancy?	☐Governmental clinic ☐Non-governmental clinic	☐UNRWA clinic ☐Others (……)
18.	Did you receive preconception care PCC?	☐Yes, please define the service you have received? (……..)	☐No
19.	When did you start visiting antenatal care clinic during current pregnancy?	☐1st trimester ☐2nd trimester	☐3rd trimester
20.	Did you complain of recurrent vaginal bleeding during last pregnancy?	☐ Yes, specify trimester……	☐ No
21.	Have you a history of chronic medical problems such as HTN or DM?	☐ Yes, Specify…….	☐ No
22.	Have you had m any health problem/s related to your last pregnancy? e.g., preeclampsia	☐ Yes, Specify……	☐ No
23.	What was the fetal position in the last month of pregnancy?	☐ Cephalic ☐ Breach	☐ Transverse
24.	Before pregnancy, did you discuss the pregnancy issue with your husband?	☐ No ☐ Yes, with disagreement	☐ Yes, with an agreement
25.	Before pregnancy, did you have a desire to be pregnant?	☐ No ☐ Yes (Skip Q. 26)	☐ I don't know

26.	Did you take any steps to terminate the pregnancy?	☐ Yes, Specify……..……	☐ No
Domain V: Sporting regimen			
27.	Did you do a sporting regimen during your last pregnancy?	☐ No (Go to domain VI) ☐ Yes, ≥ 3 times per week	☐Yes, sometimes (< 2 per week)
28.	What were the main sports you have done? (Select all that apply)	☐ Deep breathing ☐ Walking ☐ Yoga	☐ Physio ball exercise. ☐ Others ……
29.	When did you start the sports regimen?	☐ 1st trimester ☐ 2nd trimester ☐ Others ……	☐ 3rd trimester ☐ Before delivery only
30.	How long has exercise been taken?	☐ Less than 10 min. ☐ More than 20 min.	☐ 10-20 min.
31.	Which physical exercise has been done at your delivery? (Select all that apply)	☐ Deep breathing ☐ Walking ☐ Others ……	☐ Physio ball exercise ☐ Back massage
32.	Did you do sport while you suffering from vaginal bleeding?	☐ Yes	☐ No
Domain VI: Psychological and social stressors during pregnancy			
33.	Since beginning the of pregnancy, have you felt a safe within your family?	☐ Yes	☐ No
34.	Since becoming pregnant, have you felt exhausted resulting from excessive social responsibilities in your home?	☐ Yes	☐ No
35.	How do you rate the level of psychological pressures you faced during your last pregnancy?	☐ Mostly, nothing ☐ Moderate	☐ Mild ☐ Severe
36.	Since becoming pregnant, have you lived with your husband's family?	☐ Yes	☐ No **(skip Q.37)**
37.	Did living with your husband's family improves your psychological state during pregnancy?	☐ Yes	☐ No
38.	Did you expose to domestic violence during your last pregnancy?	☐ Yes, Specify…….	☐ No
39.	Have you had a hard birth during your current delivery?	☐ Yes	☐ No
40.	Since beginning the of pregnancy, have you felt anxious in a continuous manner?	☐ Yes	☐ No
Domain VII: Nursing implications			
41.	Did you receive nursing antenatal care during your last pregnancy in primary care centers?	☐ Yes	☐ No **(Go to Q.54)**
42.	Have you instructed by sporting regimen during your pregnancy?	☐ Yes	☐ No

43.	Did you receive comprehensive nursing care through visits?	☐ Yes	☐ No
44.	How many times did you visit the antenatal clinic during your last pregnancy? _____	☐ 1-3 times ☐ 9 times or more	☐ 4-8 times
45.	Have you received an explanation of the birth process in order to reduce your fear factor?	☐ Yes	☐ No
46.	Did you have any instructions about your fetus position before delivery?	☐ Yes	☐ No
47.	Did the health care providers introduce themselves during giving service?	☐ Yes	☐ No
48.	Did you receive an explanation about conducted procedures or services during nursing care?	☐ Yes	☐ No
49.	Did you receive educational instructions about sporting during antenatal care visits?	☐ Yes	☐ No (Skip Q.50)
50.	Which sporting regimen/s you were instructed at primary health care? (Select all that apply)	☐ Deep breathing ☐ Walking ☐ Others ……	☐Physio ball exercise ☐Back massage
51.	Did you receive psychological support from nurses during antenatal visits?	☐ Yes	☐ No
52.	Did you receive educational health instructions about stress- relieving strategies during visits?	☐ Yes	☐ No
53.	Do you think that the nurses gave an optimal service during your visits?	☐ Yes	☐ No
54.	Did you receive special instructions from nurses about physical exercises during the labor process?	☐ Yes	☐ No (Skip Q.55)
55.	Which sporting regimen/s you were instructed? (Select all that apply)	☐ Deep breathing ☐ Walking ☐ Others ……	☐ Physio ball exercise ☐ Back massage
56.	Did you think the number of the nursing staff was enough to get ideal care on time?	☐ Yes	☐ No
57.	Did you think the nurses have been given optimal services during the delivery process?	☐ Yes	☐ No

Thanks for your participation

Annex (7): Study tool- Arabic version

استبانـة لدراســة

العوامل والتدخـلات التمريضيــة المرتبطــة بالولادات القيصرية غير المخطط لها بالمستشفيات الحكومية في جنوب قطاع غزة: دراسة الحالات والشواهد

الرقم المتسلسل:		□ ولادة قيصرية طارئة (حالــة)
		□ ولادة طبيعية (شــاهد)

الرجاء اختار الإجابة التي تتوافق وتتناسب مع توجهك في ما يلي:-

المحور الاول: المتغيرات الديموغرافية للأم:				
المستشفى (تطابق)	□ التحرير	□ الإمارتي		
العمر ..... عام	□ أقل من 20	□ 20 – 24	□ 25 – 30	□ 30<
مكان الأقامة	□ مخيم	□ قرية	□ مدينة	
المستوى التعليمي	□ إبتدائي أو أقل	□ اعدادي	□ ثانوي	
	□ جامعي	□ دراسات عليا		
الحالة الأجتماعية الحالية	□ أعيش مع زوجي	□ غير ذلك: (□منفصلة □ مطلقة □أرملة)		
المهنة	□ تعمل	□ ربة منزل		
مهنة الزوج	□ يعمل	□ لا يعمل		
عدد أفراد العائلة	.....			
الدخل الشهري للأسرة بالشيكل	.....			
المستوى المعيشي للأسرة	□ < 1974 شيكل (فقير)	□ 1974 – 2470 شيقل (تحت خط الفقر)	□ ≥ 1974 شيكل	

المحور الثاني: المتغيرات الجسمانية للأم و المولود				
1.	وزن الأم عند حدوث الحمل	..... كجم		
2.	وزن الأم مباشرة عند الميلاد	..... كجم		
3.	معدل زيادة وزن الأم خلال الحمل (..... كجم)	□ أقل من 11.5	□ 11.5 - 16	□ أكثر من 16
4.	طول الأم عند الحمل (..... سم)	□ أقل من 150	□ ≥ 150	
5.	مؤشر كتلة جسم الأم (يحسب بواسطة الباحثة)	..... كجم/م^2		
6.	نسبة هيموجلبين الأم عند الميلاد (..... مجم/د)	□ <11 مجم / د. (فقر دم)	□ ≥ 11 مجم/ د .(طبيعي)	

7.	العمر الحملي للجنين عند الميلاد..... أسبوع	☐ أقل من 37	☐ 37 -42	☐ أكثر من 42
8.	وزن الرضيع عند الميلاد ..... كجم	☐ أقل من 2500	☐ ≥ 2500	
المحور الثالث: التاريخ السابق لأمراض النساء				
9.	التشخيص الطبي للأم	_____ (يُسجل من ملف الأم)		
10	ما هي نتيجة الميلاد الحالي	☐ مولود واحد	☐ توأم (اثنان فأكثر)	
11	عدد الحمولات السابقة	☐ الحمل الأول ☐ 5 مرات أو أكثر	☐ 2 - 4 مرات	
12	عدد الولادات السابقة يشمل الإجهاض بعد 24 إسبوع	☐ بكرية **(تخطي سؤال 13،14)** ☐ 5 مرات أو أكثر	☐ 2 - 4 مرات	
13	المسافة بين حملك الأخير والولادة السابقة **.....**	☐ أقل من سنة ☐ 3 سنوات فأكثر	☐ 1 -2 سنة	
14	هل كان لديكِ ولادات قيصرية سابقة؟	☐ نعم (كم مرة .....)	☐ لا	
15	ما هو الجزء النازل به الجنين عند الميلاد؟	☐ الرأس ☐ المقعدية	☐ الكتف	
16	هل كانت وسيلة نقلك للمشفى آمنة؟	☐ نعم	☐ لا	
المحور الرابع: رعاية ما قبل الميلاد				
17	أين كنتي تتابعين في حملك الأخير؟	☐ عيادات الحكومة ☐ مراكز صحية مجتمعية	☐ عيادات الوكالة ☐ غير ذلك (.....)	
18	هل تلقيتي رعاية ما قبل الحمل؟	☐ نعم، إذكري نوع الخدمة؟(.....)	☐ لا	
19	متى بدأتي متابعة رعاية الحوامل في حملك الحالي؟	☐ الثلث الأول من الحمل ☐ الثلث الثاني من الحمل	☐ الثلث الثالث من الحمل	
20	هل عانيتي من نزيف مهبلي متكرر أثناء الحمل؟	☐ نعم [في أي ثلث من الحمل]	☐ لا	
21	هل لديكِ تاريخ مرضي سابق بأمراض مزمنة؟ مثال: سكري، ضغط	☐ نعم اذكريها:	☐ لا	
22	هل كانت لديكِ مشكلة صحية تتعلق بحملك الأخير؟ مثال: تسمم الحمل	☐ نعم: اذكريها:	☐ لا	
23	كيف كان استلقاء الجنين في الشهر الأخير من الحمل؟	☐ استلقاء طولي رأسي ☐ استلقاء طولي مقعدي	☐ استلقاء عرضي	
24	قبل حملك مباشرة، هل تم مناقشة موضوع الحمل مع زوجك؟	☐ لم يتم مناقشة الامر ☐ تم، بالرفض	☐ تم المناقشة، بالاتفاق	

25	قبل حملك مباشرة، هل كنتي ترغبين بالحمل؟	☐ لا أرغب بالحمل ☐ نعم أرغب **(تخطي سؤال 26)**	☐ مشاعر مختلطة
26	هل اتخذتي خطوات لانهاء الحمل؟	☐ نعم: **اذكريها**:	☐ لا
المحور الخامس: النظام الرياضي			
27	هل مارستي نظام رياضي معين خلال فترة حملك الأخير؟	☐ لا **(الانتقال للمحور السادس)** ☐ دائماً (≥ 3 مرات أسبوعياً)	☐ أحياناً (≤ مرتين اسبوعياً)
28	ماهو النشاط الرياضي الرئيسي التي كنتي تمارسينه أثناء فترة الحمل؟ (حددي الذي ينطبق)	☐ النفس العميق ☐ المشي ☐ اليوغا	☐ الجلوس على الكرة ☐ تدليك الظهر ☐ غير ذلك: .....
29	متى بدأتي بممارسة النشاط الرياضي؟	☐ الثلث الأول ☐ الثلث الأخير ☐ غير ذلك: ----------	☐ الثلث الثاني ☐ قبل الميلاد فقط
30	كم كانت تستغرق فترة النشاط الرياضي؟	☐ أقل من 10 دقائق ☐ أكثر من 20 دقيقة	☐ 10 – 20 دقيقة
31	ماهو النشاط الرياضي التي مارستيه أثناء ميلادك الحالي؟ (حددي الذي ينطبق)	☐ النفس العميق ☐ المشي ☐ غير ذلك:	☐ الجلوس على الكرة ☐ تدليك الظهر
32	هل حدث أن مارستي نشاط رياضي في ظل وجود نزيف مهبلي؟	☐ نعم	☐ لا
المحور السادس: الضغوطات النفسية والاجتماعية خلال فترة الحمل			
33	منذ بداية الحمل، هل شعرتي بالأمان في ظل عائلتك؟	☐ نعم	☐ لا
34	منذ أن أصبحتي حاملاً، هل شعرتي بالأرهاق من المسؤليات الأجتماعية لبيتك؟	☐ نعم	☐ لا
35	كيف تقدرين مستوى الضغوطات النفسية التي تعرضتي لها أثناء حملك الاخير؟	☐ غالباً لا يوجد ضغوطات ☐ متوسطة	☐ بسيطة ☐ شديدة
36	منذ أن أصبحتي حاملاً، هل تسكنين في منزل واحد مع أهل زوجك؟	☐ نعم	☐ لا **(تخطي سؤال37)**
37	هل وجودك في بيت أهل الزوج ساعد في تحسن الحالة النفسية لديكِ أثناء فترة الحمل؟	☐ نعم	☐ لا
38	هل تعرضتي لعنف أسري أثنا فترة حملك الأخير؟	☐ نعم اذكريها:	☐ لا

39	هل كان ميلادك متعسر في حملك الأخير؟	☐ نعم	☐ لا
40	منذ بداية الحمل، هل شعرتي بالتوتر المستمر؟	☐ نعم	☐ لا
المحور السابع: التدخلات التمريضية			
41	هل كانت هناك متابعة لرعاية حملك الأخير من قبل التمريض في مراكز رعاية الحمل؟	☐ نعم	☐ لا **(الانتقال لسؤال 54)**
42	هل تم إرشادك بالتمارين الرياضية خلال حملك؟ ☐ لا ☐ نعم **إذا كانت الإجابة نعم**: ماهي التمارين التي تم إرشادكِ بها؟ (حددي جميع ما ينطبق)	☐ النفس العميق ☐ المشي ☐ غير ذلك:	☐ الجلوس على الكرة ☐ تدليك الظهر
43	هل تلقيتي رعاية تمريضية شاملة خلال زيارتك؟	☐ نعم	☐ لا
44	كم عدد الزيارات لمركز رعاية الحمل خلال فترة حملك؟	☐ 1 – 3 مرات ☐ 9 مرات فأكثر	☐ 4 -8 مرات
45	هل تلقيتي شرح حول عملية الولادة الطبيعية تهدف للتخفيف من عامل القلق والتوتر لديك؟	☐ نعم	☐ لا
46	هل تلقيتي النصح بخصوص وضع الجنين قبل الولادة؟	☐ نعم	☐ لا
47	هل تلقيتي تعريف شخصي من قبل مقدمي الرعاية الصحية لكِ؟	☐ نعم	☐ لا
48	هل هناك تعريف بكل إجراء أوخدمة تقدم لكِ أثناء الرعاية التمريضية؟	☐ نعم	☐ لا
49	هل تلقيتِ إرشادات/ندوات خاصة بالأنشطة الرياضية من قبل التمريض خلال الزيارات؟	☐ نعم	☐ لا **(تخطي سؤال 50)**
50	ما هي التماريين التي تم ارشادك بها من قبل التمريض داخل مراكز رعاية الحمل؟ (حددي جميع ما ينطبق)	☐ النفس العميق ☐ المشي ☐ غير ذلك:	☐ الجلوس على الكرة ☐ تدليك الظهر
51	هل تلقيتِ الدعم النفسي من طاقم التمريض خلال الزيارات؟	☐ نعم	☐ لا
52	هل تلقيتِ ارشادات /ندوات تثقيفية خاصة بالتفريغ النفسي من قبل التمريض خلال الزيارات؟	☐ نعم	☐ لا

53	هل تعتقدين أن الطاقم التمريض قام بالدور المناط به لرعاية ما قبل الميلاد؟	☐ نعم	☐ لا
54	هل تلقيتِ إرشادات خاصة بالتماريين الرياضة من قبل التمريض أثناء المخاض؟	☐ نعم	☐ لا (تخطي سؤال 55)
55	ما هي التماريين التي تم ارشادك بها أثناء فترة المخاض؟ (حددي جميع ما ينطبق)	☐ النفس العميق ☐ المشي ☐ غير ذلك:	☐ الجلوس على الكرة ☐ تدليك الظهر
56	هل تعتقدين ان عدد الممرضات كان كافياً لتقديم الخدمة المطلوبة في الوقت المناسب	☐ نعم	☐ لا
57	هل تعتقدين أن الطاقم التمريض قام بالدور المناط به أثناء عملية المخاض والولادة؟	☐ نعم	☐ لا

نشكركم على حُسن مشاركتكم

Annex (8): List of experts

No.	Name	Specialty	Affiliation
1	Dr. HamzaAbdeljawad	Assistant Professor of Nursing science	Al-Quds Univrsity
2	Dr. Ahmed A. Najim	Assistant Professor of Community Health Nursing	Al Azhar University-Gaza, Palestine
3	Dr. Kaled Zimmo	Specialist of Obstetrics and Gynecology	Gynecologist and obstetrician- MoH
4	Mrs. Emtethal Daoud Abu Eyada	RN, BSN ,high diploma in midwifery ,master MCH	Head of midwifery program- PCN, MoH
5	Dr. Areefa Al Bahri	PhD maternal &child health nursing	Islamic University
6	Dr. Ayman Abu Mustafa	PhD in Biochemistry & Statistician	Palestine College of Nursing

Annex (9): Consent form

عزيزتي المشاركة

أنا الباحثة/ لجين أحمد إبراهيم أبو مصـطفى أقوم بعمل دراسـة للحصـول على درجة الماجسـتير في المهن الصحية مسار صحة الأم والطفل– كلية المهن الصحية بجامعة القدس- القدس (أبوديس).

يسعدني مشاركتك الفاعلة في بحث بعنوان

Factors and Nursing Implications Associated with unplanned Cesarean Births in South Governmental Hospitals of Gaza Strip: A Case-Control Study

(العوامل والآثار التمريضية المرتبطة بالولادات القيصرية غير المخطط لها في المستشفيات الحكومية الجنوبية لقطاع غزة: دراسة حالات وشواهد)

وقد تم اختيارك ضمن المشاركات في هذا البحث بشكل عشوائي

إذا كنت موافقة على المشاركة في هذه الدراسة، يرجى التكرم بقراءة العبارات التالية بدّقة والإجابة عنها بموضوعية لما في ذلك من أثرٍ كبير على صحة النتائج والنصائح التي سوف تتوصل إليها الباحثة. مع التأكيد بأن هذه البيانات سوف تستخدم لأغراض البحث العلمي فقط، وسيتم التعامل معها بسرية تامة.

ملاحظة / الوقت اللازم لتعبئة الاستبانة كاملة يستغرق 20 دقيقة فقط.

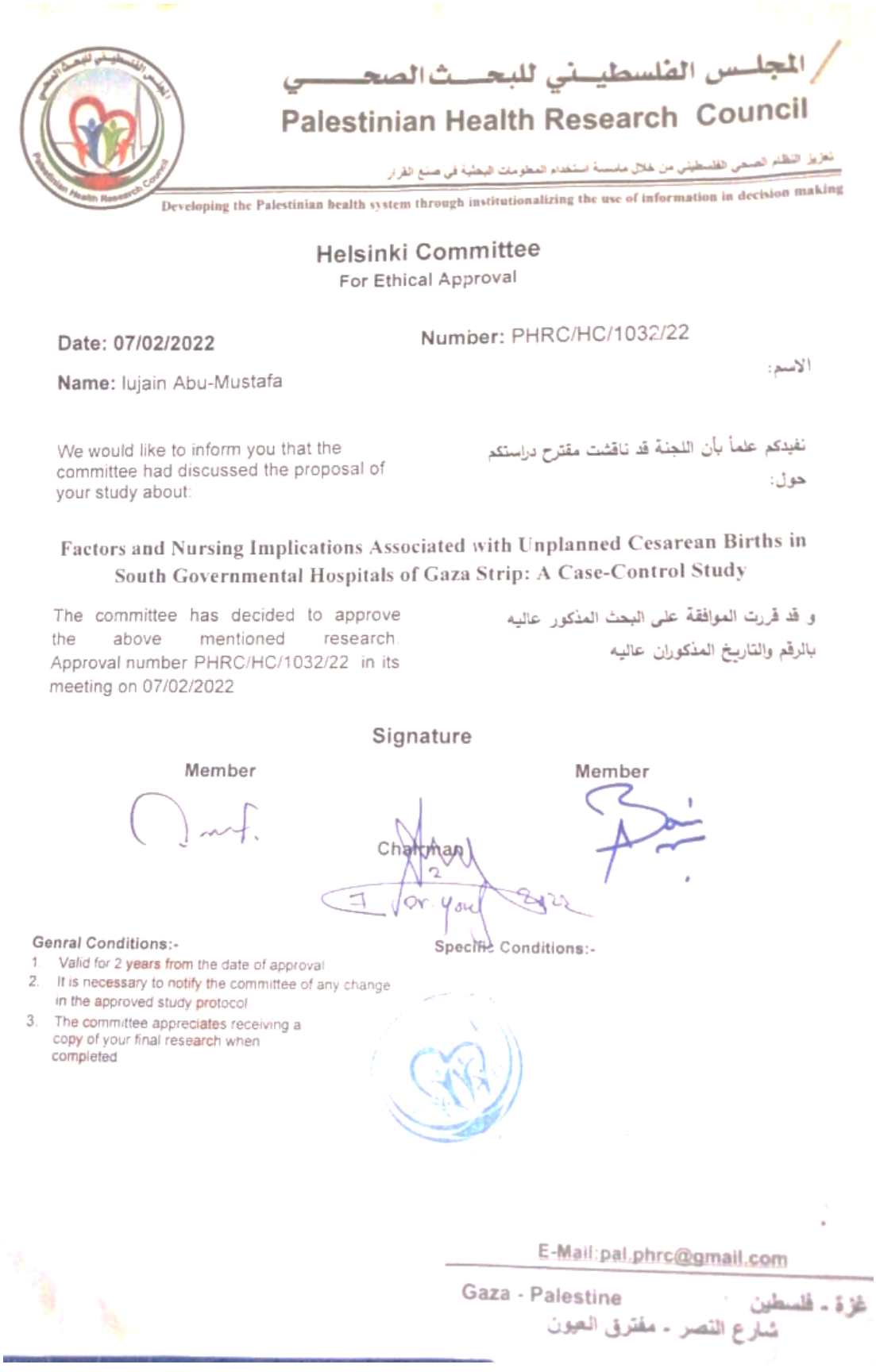
أشكركم على حسن تعاونك

الباحثة	المشرف
لجين أبو مصطفى	د. أكرم أبو صلاح

مجموعة: حالات☐

شواهد☐

Annex (10): Helsinki committee approval



المجلس الفلسطيني للبحث الصحي
Palestinian Health Research Council
تعزيز النظام الصحي الفلسطيني من خلال مأسسة استخدام المعلومات البحثية في صنع القرار
Developing the Palestinian health system through institutionalizing the use of information in decision making

Helsinki Committee
For Ethical Approval

Date: 07/02/2022 Number: PHRC/HC/1032/22

Name: Iujain Abu-Mustafa الاسم:

We would like to inform you that the committee had discussed the proposal of your study about: نفيدكم علماً بأن اللجنة قد ناقشت مقترح دراستكم حول:

Factors and Nursing Implications Associated with Unplanned Cesarean Births in South Governmental Hospitals of Gaza Strip: A Case-Control Study

The committee has decided to approve the above mentioned research. Approval number PHRC/HC/1032/22 in its meeting on 07/02/2022 و قد قررت الموافقة على البحث المذكور عاليه بالرقم والتاريخ المذكوران عاليه

Signature

Member Member

Chairman

Genral Conditions:-
1. Valid for 2 years from the date of approval
2. It is necessary to notify the committee of any change in the approved study protocol
3. The committee appreciates receiving a copy of your final research when completed

Specific Conditions:-

E-Mail:pal.phrc@gmail.com
Gaza - Palestine غزة - فلسطين
شارع النصر - مفترق العيون

Annex (11): MOH approval letter

State of Palestine
Ministry of health

دولة فلسطين
وزارة الصحة

السيد : جهاد عبدالقادر عكاشه المحترم

التاريخ:15/08/2022

رقم المراسلة 1030943

مدير دائرة الإدارة العامة للوحدات الإدارية المساعدة/وزارة الصحة

السلام عليكم ...

الموضوع/ تسهيل مهمة الباحثة لبين ابراهيم أبو مصطفى .

التفاصيل // السلام عليكم نهديكم أطيب التحيات ونود منكم تسهيل مهمة الباحث/ة لبين ابراهيم احمد أبو مصطفى الملتحق/ة ببرنامج ماجستير صحة الأم والطفل – جامعة القدس أبو ديس في اجراء بحث بعنوان: العوامل والتداعيات التمريضية المرتبطة بالولادات القيصرية غير المخطط لها بالمستشفيات الحكومية في جنوب قطاع غزة: دراسة الحالات والشواهد حيث الباحث/ة بحاجة لتعبئة استبانة من عدد من العاملين والمرضى المراجعين في مرافق وزارة الصحة (مجمع ناصر الطبي – مستشفى الهلال الاماراتي) . دون اجراء أي تدخل طبي او سحب عينات دم ، نأمل توجيهكم لذوي الاختصاص بضرورة الحصول على الموافقة المستنيرة من المشاركين ، بما لا يتعارض مع مسلمة العمل وضمن أخلاقيات البحث العلمي، ودون تحمل الوزارة أي أعباء أو مسئولية وتفضلوا بقبول التحية والتقدير ملاحظات / تسهيل المهمة الخاص بالدراسة أعلاه صالح لمدة 3 أشهر من تاريخه. يرجى التأكد من توافق الاستبانة المرفقة والتي يتم تعبئتها ميدانيا على ان لا يتم أي إضافة او تعديل على الاستبانة المرفقة

علي حسن البلبيسي

رئيس قسم تمريض طوارئ أطفال

المرفقات

* استبانة لبين ابراهيم أبو مصطفى.pdf

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غزة تلفون. (+970) 8-2846949
فاكس. (+970) 8-2826295

Annex (12): A-Quds University Facilitation Letter

Al Quds University

Faculty of Health Professions

Nursing Dept. –Gaza

جامعة القدس

كلية المهن الصحية

دائرة التمريض- غزة

التاريخ:2022/8/13

حضرة الأخ/ أ. هاني سلطان الوحيدي حفظه الله

مدير عام وحدة المعلومات الصحية بوزارة الصحة

السلام عليكم ورحمة الله وبركاته

الموضوع: تسهيل مهمة الطالبة الباحثة لجين إبراهيم أبو مصطفى

تهديكم كلية المهن الصحية بجامعة القدس أطيب التحيات، ونرجو من حضرتكم مساعدة الطالبة المذكورة بخصوص جمع معلومات خاصة بموضوع دراستها البحثية للحصول على درجة الماجستير في تمريض صحة الأم والطفل بعنوان:

Factors and Nursing Implications Associated with Unplanned Cesarean Births in South Governmental Hospitals of Gaza Strip: A Case-Control Study

حيث ستكون عينة الدراسة من السيدات المترددات علي مستشفيات وأقسام الولادة في جنوب قطاع غزة (م. التحرير بمجمع ناصر – م. الإماراتي) من خلال تعبئة استبانة لحالات الولادة القيصرية الغير مخطط لها وحالات الولادة الطبيعية.

وتفضلوا بقبول وافر الاحترام والتقدير

د. حمزة محمد عبد الجواد

أستاذ مساعد في علوم التمريض

منسق برامج ماجستير التمريض بغزة

كلية المهن الصحية - جامعة القدس

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تلفاكس: 082644220

Abstract in Arabic

عنوان الدراسة: العوامل والتدخلات التمريضية المرتبطة بالولادات القيصرية غير المخطط لها بالمستشفيات الحكومية في جنوب قطاع غزة: دراسة الحالات والشواهد

إعداد الباحثة: لجين إبراهيم أحمد أبو مصطفى

إشراف: د. أكرم أبو صلاح

الملخص:

المقدمة: على الرغم من البحث وجهود الوقاية لعقود عديدة، لا تزال العملية القيصرية مشكلة صحية عامة في مناطق مختلفة. في العديد من البلدان. الهدف من الدراسة: استهدفت الدراسة دراسة العلاقة بين العوامل النفاسية المختارة وحدوث الولادة القيصرية غير المخطط لها ؛ وتحديد الآثار المترتبة على التدخلات التمريضية أثناء فترات الحمل والولادة. المنهجية والأساليب: استخدمت هذه الدراسة تصميماً كمياً تحليلياً للحالات والشواهد؛ مع المطابقة بنسبة 1:1 لمتغير قد يكون دخيلاً، وهو متغير مكان الولادة. أجريت الدراسة في المستشفيين الحكوميين لخدمات التوليد والأمومة في المحافظات الجنوبية في قطاع غزة ؛ مستشفيي التحرير والإماراتي. حيث شملت العينة 400 امرأة ؛ 200 امرأة ولادة قيصرية كحالات، و 200 امرأة ولادة طبيعية كضوابط. تم مراجعة استبين الدراسة المصمم من خلال مجموعة من المختصين لجمع البيانات و تم مراعاة الاعتبارات الأخلاقية أثناء جمع البيانات. النتائج: أظهرت النتائج أن أعمار النساء المشاركات الذين ولدن ولادات قيصرية غير المخطط لها كانت في الفئات العمرية التي تقل عن 20 عامًا ، 20–24 عامًا ، 25–30 عامًا ، و أكثر من 30 عامًا، بنسب مئوية تبلغ 11٪ ، 26٪ ، 33٪ ، 30٪ على التوالي. بينت الدراسة أن المؤشرات الاجتماعية الديمغرافية التالية مرتبطة إحصائياً بزيادة خطر الولادة غير المخطط لها : صغار الأمهات اللاتي تقل أعمارهن عن 20 سنة (نسبة الارجحية المتطابقة 4.17) ، مستوى تعليم الأمهات الذي يقل عن 9 سنوات (نسبة الارجحية المتطابقة:2.87) ، والنساء المنفصلات (نسبة الارجحية المتطابقة: 5.21)، والأب العاطل عن العمل (نسبة الارجحية المتطابقة : 1.7)، الأم العاطلة عن العمل (نسبة الارجحية المتطابقة: 1.6) ، وأفراد الأسرة بين 4 و 6(نسبة الارجحية المتطابقة: 1.78)، وأفراد الأسرة أكثر من6 (نسبة الارجحية المتطابقة : 2.01) ، والدخل الشهري المنخفض أقل من 1974 شيقل اسرائيلي (نسبة الارجحية المتطابقة: 2.57).

أظهرت النتائج المتعلقة بالخصائص الجسدية للأم وحديثي الولادة أن الأم السمينة ذات مؤشر كتلة جسم أكبر من 30(نسبة الارجحية المتطابقة: 2.28)، قامة أم أقل من 150 سم (نسبة الارجحية المتطابقة: 3.82)، زيادة الوزن بأكثر من 16 كجم أثناء الحمل (نسبة الارجحية المتطابقة: 2.6)، فقر الدم (نسبة الارجحية المتطابقة: 1.62)، عمر الحمل أقل من 37 أسبوعًا (نسبة الارجحية المتطابقة :8.66) وأكثر من 42 أسبوعًا (نسبة الارجحية المتطابقة: 4.60) ارتبطت إحصائيًا بزيادة خطر ولادة قيصيرية غير المخطط لها. اضافة على ذلك، أظهرت الدراسة أن التاريخ السابق لأمراض النساء والتوليد مثل قلة السائل الامنوسي (نسبة الارجحية المتطابقة:8.29)، ارتفاع الضغط اثناء الحمل (نسبة الارجحية المتطابقة:9.38)، تخطيط جنين سيء (نسبة الارجحية المتطابقة: 20.38)، مجيء مقعدي للمولود (نسبة

الارجحية المتطابقة: 3.03)، المخاض المسدود (نسبة الارجحية المتطابقة: 6.32)، الأجنة المتعددة (نسبة الارجحية المتطابقة: 5.21)، ولادة متكررة (نسبة الارجحية المتطابقة: 2.21) ولادة بكر (نسبة الارجحية المتطابقة: 2.04)، مدة قصيرة بين الولادات التي تقل عن 2 سنوات (نسبة الارجحية المتطابقة: 5.29) وولادة السابقة في مرحلة ما قبل الولادة (نسبة الارجحية المتطابقة: 6.03) ارتبطت إحصائيًا بزيادة خطر ولادة قيصيرية غير المخطط لها. العوامل المتصلة بالرعاية السابقة قبل الولادة و متابعة الحمل الأخير في العيادة الحكومية (نسبة الارجحية المتطابقة: 0.46)، بدء زيارات رعاية الحمل خلال الأشهر الثلاثة الأولى من الحمل (نسبة الارجحية المتطابقة: 0.62)، نزول مقعدي للجنين خلال اخر شهر في الحمل (نسبة الارجحية المتطابقة:11.61)، وعدم مناقشة قضايا الحمل مع الزوج (نسبة الارجحية المتطابقة: 1.57) أيضا ترتبط بنسبة حصول ولادة قيصرية غير مخطط لها. عوامل الخطر المتعلقة بنظام الرياضة أثناء الحمل الأخير، عدم القيام بتمارين التنفس العميق (نسبة الارجحية المتطابقة: 4.21)، عدم القيام بتمارين الكرات الفيزيائية (نسبة الارجحية المتطابقة: 11.83)، وعدم المشي (نسبة الارجحية المتطابقة :4.27)، عدم القيام بتدليك الضهر خلال الحمل الأخير (نسبة الارجحية المتطابقة: 16.74)، عدم القيام بتمارين التنفس العميق أثناء الولادة (نسبة الارجحية المتطابقة: 2.05)، وتدليك الظهر أثناء الولادة (نسبة الارجحية المتطابقة: 3.605) ، وعدم المشي أثناء الولادة (نسبة الارجحية المتطابقة:1.627) وعدم ممارسة الرياضات الأخرى أثناء الحمل (نسبة الارجحية المتطابقة:2.306). عوامل الخطر المتعلقة بالضغوط النفسية والاجتماعية أثناء الحمل :عوامل خفيفة (نسبة الارجحية المتطابقة: 12.53)، معتدلة (نسبة الارجحية المتطابقة:12.918)، ومستويات شديدة من الضغوط النفسية (نسبة الارجحية المتطابقة:8.138) ،العنف المنزلي (نسبة الارجحية المتطابقة:5.71)، ومواجهة عملية ولادة متعسرة (نسبة الارجحية المتطابقة:2.25). وأخيراً أظهرت الدراسة أن العوامل المتعلقة بالتدخلات التمريضية مثل عدم تلقي تعليمات من الأنظمة الرياضية أثناء الحمل (نسبة الارجحية المتطابقة:1.84) ، عدد زيارات رعاية الحمل1 إلى 3 مرات (نسبة الارجحية المتطابقة :0.56) و4 إلى 8 زيارات (نسبة الارجحية المتطابقة:0.42) ، دون تلقي تفسير لعملية الولادة لتقليل عامل الخوف لديهم (نسبة الارجحية المتطابقة:1.67) ، عدم إصدار تعليمات بالتنفس العميق (نسبة الارجحية المتطابقة :2.76) ، عدم إصدار تعليمات بالمشي(نسبة الارجحية المتطابقة:1.6)، عدم إصدار تعليمات بتدليك الظهر (نسبة الارجحية المتطابقة :2.79). الاستنتاج والتوصيات: خلصت الدراسة إلى أن تعرض الأم للعديد من الخصائص المذكورة مسبقًا كالعوام الديموغرافية، و قياسات الام، وتاريخ التوليد السابق، و زيارات رعاية الحمل، والنظام الرياضي، والضغوط النفسية والاجتماعية أثناء الحمل كانت مرتبطة بشكل مستقل بالولادة القيصرية غير المخطط لها. غالبية هذه العوامل هي عوامل قابلة للتعديل والتي مع تمسك الأم بالسلوك الصحي، بجانب الآثار التمريضية المناسبة يمكن أن تؤدي إلى تقليل عمليات الولادات القيصرية غير المخطط لها.