

JANE IFEDIBA CHUDE, Mph.

ID: UD74794HMA83966

COURSE NAME: DOCTORATE IN MATERNAL AND CHILD HEALTH SCIENCE

Started: 30/10/2021 | Planned Graduation: 10/30/2023

TOPIC: LARGE POPULATION STUDY OF THE HEALTH_PUBLIC SECTOR TO INFLUENCE THE LENGTH OF HOSPITAL STAY OF WOMEN UNDERGOING CESAREAN SECTION.

- a) FACTORS ASSOCIATED WITH THE LENGTH OF HOSPITAL STAY OF WOMEN UNDERGOING CESAREAN SECTION.

- b) HOSPITAL-ACQUIRED CONDITIONS AND LENGTH OF STAY IN THE PREGNANCY AND PUERPERAL CYCLE





TOPIC: LARGE POPULATION STUDY OF THE HEALTH PUBLIC SECTOR TO INFLUENCE THE LENGTH OF HOSPITAL STAY OF WOMEN UNDERGOING CESAREAN SECTION.

- c) FACTORS ASSOCIATED WITH THE LENGTH OF HOSPITAL STAY OF WOMEN UNDERGOING CESAREAN SECTION.
- d) HOSPITAL-ACQUIRED CONDITIONS AND LENGTH OF STAY IN THE PREGNANCY AND PUERPERAL CYCLE

BY

CHUDE .I. JANE M.ph

PhD. MATERNAL AND CHILD HEALTH SCIENCE

FOR

ATLANTIC INTERNATIONAL UNIVERSITY

08/2022

INTRODUCTION

There is an increasing caesarean delivery (CD) rate globally and the length of hospital stay is longer in caesarean delivery compared with vaginal delivery.

However, when it's not possible or safe for a woman to deliver a baby naturally through her vagina, she will need to have her baby delivered surgically, a procedure referred to as caesarean section, or C-section.

I know this is a controversial topic recently, because sometimes people talk about C-sections being done too often as unnecessary. That may be true, but when it is necessary, it can be life saving for mother and baby. A C-section is the delivery of a baby through a surgical opening in the mother's lower belly area, usually around the bikini line. The procedure is most often done while the woman is awake. The body is numbed from the chest to the feet using epidural, or spinal, anaesthesia. The surgeon usually makes a cut or incision across the belly just above the pubic area. The surgeon opens the womb, or uterus, and the amniotic sac, then delivers the baby.

A woman may have a C-section if there are problems with the baby, such as an abnormal heart rate, abnormal positions of the baby in the womb, developmental problems in the baby, a multiple pregnancy like triplets, or when there are problems with the placenta or umbilical cord. A C-section may also be necessary if the mother has medical problems, such as an active genital herpes infection, large uterine fibroids near the cervix, or if she is too weak to deliver due to severe illness.

Sometimes a delivery that takes too long, caused by problems like getting the baby's head through the birth canal, or in the instance of a very large baby may make a C-section necessary. Having a C-section is a safe procedure. The rate of complications is very low. However, there are some risks, including infection of the bladder or uterus, injury to the urinary tract, and injury to the baby. A C-section may also cause problems in future pregnancies. The average hospital stay after a C-section is 2 to 4 days, and keep in mind recovery often takes longer than it would from a vaginal birth. Walking after the C-section is important to speed recovery and pain medication may be supplied too as recovery takes place. Most mothers and infants do well after a C-section, and often, a woman who has a C-section may have a vaginal delivery if she gets pregnant again.

According to the World Health Organization (WHO), a country's Caesarean rate should not be less than 5% and should fall within a threshold of 10 – 15% in order to successfully minimize maternal deaths. In Nigeria, the incidence of caesarean section (CS) ranges from 2-2.7%, and it would have been greater if the taboo surrounding caesarean surgery and other forms of breech presentations were not widely believed (Udobang, 2018). These would be properly discussed in subsequent sections of this study. Nigeria's maternal mortality ratio (MMR) was 512 deaths per 100,000 live births, and this could be because of the country's very low CS rates. The 2018 MMR confidence interval runs from 447 to 578 deaths per 100,000 live births (NDHS, 2018).

The level of pain you experience during childbirth is unique. For example, if you opt for an unmedicated vaginal birth, you can expect more pain than someone who had an epidural before a vaginal birth. During a C-section delivery, you won't feel much pain. However, recovering from a C-section may be more painful and take longer than recovering from a natural birth. There isn't a right or wrong answer as to what is more painful because every birth is different.



Caesarean section amongst Nigerian women, couples and families are surrounded by a lot of fears, miseries, aversions, guilt, and misconceptions for reasons varying from the desire by women to have a natural vaginal birth, or fear of surgery, cultural beliefs, religious practices, morbidity and deaths from the operation and prolonged hospital stay.

Some hospitals are providing 'enhanced recovery' strategies for planned caesarean (called ERAC or ERAS) to help women manage their pain better, eat and drink earlier, move around earlier, care for their baby more readily and go home earlier. You will be informed at the time of booking the caesarean if your hospital is providing this type of care.

The longest length of hospital stay was observed in the age group from 15 to 17 years old and among those aged 45 years old or more. The hospital stay of women with complications or comorbidities at the time of admission was also longer. Moreover, it was noted that the increase in criticality level was associated with an increase in the mean length of hospital stay.

The length of hospital stay of women is higher among those belonging to the age group ranging from 15 to 17 years old and for those aged 45 years old or more because of the presence of associated comorbidities, such as eclampsia, pre-existing hypertensive disorder with superimposed proteinuria and gestational hypertension (induced by pregnancy) with significant proteinuria increase the length of hospital stay.

This study enabled the construction of distinct criticality level profiles based on the combination of age groups and the main comorbidities, which were directly related to the length of hospital stay.

Evidence shows that, when performed unnecessarily, surgical deliveries may lead to a higher risk of puerperal infection, prematurity, and neonatal mortality, in addition to increasing the length of hospital stay. On the other hand, a decrease in the rates of maternal and neonatal mortality related to cesarean delivery may be noted in specific situations, such as in the presence of placenta previa or uterine rupture, making this type of delivery the safest one. Therefore, cesarean sections may have positive health impacts when properly recommended, such as to reduce the bleeding index.

Considering that the length of hospital stay of patients for similar reasons is heterogeneous, that is, there is a coefficient of variation due to the differences in the care offered by the various health institutions and to the diversity in the patients' individual characteristics, especially their complications and comorbidities, the objective of this study was to evaluate the impact of these clinical conditions and age group on the length of hospitalization of women undergoing cesarean section.

The determination of factors that influences are intrinsic to the patient's morbid state on the length of hospital stay which provides the opportunity to implement safe care management mechanisms, based on patient's health indicators of clinical risk adjustment to the length of hospitalization.

1.1 BACKGROUND

In order to meet the Sustainable Development Goal to decrease maternal mortality, increased access to obstetric interventions such as Caesarean sections (CS) is of critical importance. As a result of women's limited access to routine and emergency obstetric services in Nigeria, the country is a major contributor to the global burden of maternal mortality.

In this analysis, we aim to establish rates of CS and determine socioeconomic or medical risk factors associated with having a CS in, southeast Nigeria.

Globally, the number of Caesarean sections (CS) has been on the rise over the last decade. While CS are potentially lifesaving, the adverse maternal and perinatal outcomes when a CS is not medically necessary have become a major public health concern as the associated expenses decrease resources available for other maternal and child health interventions.

According to the World Health Organization (WHO), as a population's CS rates approach 10%, maternal and newborn deaths decrease. A medically necessary CS can prevent maternal and infant mortality; however, there is no evidence that CS benefits women who do not require the procedure. The WHO has estimated—based on rates of fistula—that in 15.5% of pregnancies in Nigeria, a CS is medically necessary. Underutilization of CS is of particular concern in most of Africa where 7.4% of all births occurred by CS in 2014.

Although most African countries have regional hospitals with surgical services available to perform CS, multiple individual and health system characteristics impede access and contribute to the delay in women seeking services during pregnancy and delivery. Thaddeus and Maine (1994) developed the “three-delay” model that has been widely accepted as a framework to explain the obstacles in obtaining adequate healthcare during pregnancy and delivery.

This three-tiered framework includes:

- i) delay in decisions to seek care,
- ii) delays in reaching a healthcare facility, and
- iii) delays in receiving adequate treatment for obstetric complications.

In sub-Saharan Africa (SSA), delayed access to healthcare services during pregnancy and delivery can be influenced by multiple factors. Lack of knowledge of the importance of perinatal care and an inability to pay for healthcare services are common reasons for delaying healthcare utilization. Women also delay seeking treatment during pregnancy and delivery because of poverty, gender inequalities in household decision making, cultural barriers, and geographical and transport barriers. Increased age, education and wealth are all positively associated with deciding to have a doctor present at delivery in SSA. When life-threatening complications occur during labor, delays in seeking adequate care can increase maternal mortality even when lifesaving CS is performed.

In 2013, Nigeria had the second highest number of maternal deaths and had the 11th highest crude birth rate, making it an important country in which to study the barriers to obtaining adequate obstetric care.

In 2014, 2% of births in Nigeria utilized CS. More than 75% of all CS in Nigeria are linked to obstetric emergencies that could have been prevented by earlier medical care.



Even with birth plans in place, many Nigerian women opt to deliver with an unskilled birth attendant in a setting other than a hospital because of barriers in seeking treatment, including cost and geographical/transportation difficulties.

Cultural factors such as gender inequalities and the acceptance of home deliveries, compared to hospital deliveries, also influence a woman's decision to deliver at a healthcare facility. Delays in seeking treatment results in women attempting to access care at healthcare facilities only after life-threatening complications develop. Increasing access to obstetric care, such as CS, decreases maternal and infant morbidity and mortality.

However, fears associated with having a CS may further delay a woman's decision to seek treatment. Common fears associated with having a CS in Nigeria include cultural beliefs that vaginal birth is a confirmation of womanhood, stigma of being mocked by other women, death, violation of religious beliefs, post-operative pain, future infertility, expense, and medical incompetence.

A woman's socioeconomic status also influences access to CS, with the richest women, as measured by wealth index, having better access to CS compared to the poorest women. Education and age are also strong predictors of a woman's willingness to have a CS in Nigeria. Women who are either younger or less educated are more likely to refuse a CS even when it is medically necessary, and this usually stems from concerns about the expense.

Even women who do attempt to access healthcare facilities during delivery, often encounter poorly trained personnel and a lack of proper equipment and supplies. Most studies evaluating pregnancy outcomes in Nigeria equate having a doctor present at delivery to having access to quality healthcare. However, this metric may not be an accurate predictor of the facility's ability to perform a CS. Many healthcare facilities within Nigeria cannot offer a CS, and ambulance services are virtually non-existent.

In fact, one study demonstrated that only 8 in 25 health facilities in Nigeria is equipped to perform CS. This complicates the ability of pregnant women to obtain adequate healthcare during pregnancy and delivery.

In order to meet the Sustainable Development Goal target of reducing the global maternal mortality ratio to less than 70 per 100,000 live births by 2030, increased access to lifesaving obstetric measures such as CS is needed. Examining factors associated with having a CS will help provide insight into ways to increase access to healthcare during pregnancy and delivery.

In addition, socioeconomic and comorbid conditions are often not examined together when exploring factors associated with CS in Nigeria.

Therefore, the aims of this paper were three-fold:

- 1) to establish the rates of CS in, southeast Nigeria
- 2) to determine socioeconomic or medical risk factors associated with having a CS, and
- 3) to determine factors associated with lengthy hospital stay Post CS.



1.2

OBJECTIVES

Most cesarean sections heal uneventfully within a predictable timeframe. However, for a small proportion of patients, the wound will develop complications. As a result, Surgical site infections are the most common post-operative complications even in hospitals with most modern facilities and standard protocols of preoperative preparation and antibiotic prophylaxis, prolonging hospital stay.

While the evidence of the effect of socio-economic status and place of residence on CS rates in Nigeria is well established, little is known about CS rates in relation to obstetric needs.

A few facility-based studies have shown increased odds of having a CS for women with overweight, previous CS and obstructed labour. Only one population-based study has investigated the association between obstetric factors and CS in Nigeria using the 2013 Demographic and Health Survey (DHS) data, showing a positive association between CS and maternal age, large birth size, multiple pregnancy, primiparity, health insurance coverage, antenatal care (ANC) and maternal obesity.

According to the latest Nigeria DHS, the maternal mortality ratio is still high at 512 per 100 000 live births (95% confidence interval (CI): 447–578). Further, the prevalence of stillbirths is estimated at 39.6/1000 births, and 32% of those stillbirths could be associated with asphyxia. A study showed that infants born by CS in Nigeria were roughly three times more likely to die than those born vaginally, indicating that the intervention might be used too late. Other factors associated with increased risk of adverse neonatal outcome during labour in Nigeria include referral status, parity, gestational age, male gender and rural residence, religious and cultural backgrounds.

After adjustment for confounding, this study demonstrated 54% higher odds of having a CS if participants had high peripheral malaria parasitemia compared to those with lower peripheral malaria parasitemia.

The present work demonstrated higher percentages of CS in older women and those with more education. In SSA, education has been shown to be a strong predictor of using professionally assisted delivery services. Older and more educated women in SSA are thought to be more confident and influential in their household decision-making, including the use of healthcare services. Likewise, women with more education and/or women who are employed often have greater control over family resources and play a larger part in reproductive decision-making. These variables may be a proxy of a woman's ability to access healthcare, thereby increasing her chances of having had a CS.

Which Is More Painful: A C-Section Or Natural Birth?

The level of pain you experience during childbirth is unique. For example, if you opt for an unmedicated vaginal birth, you can expect more pain than someone who had an epidural before a vaginal birth. During a C-section delivery, you won't feel much pain. However, recovering from a C-section may be more painful and take longer than recovering from a natural birth. There isn't a right or wrong answer as to what is more painful because every birth is different.



1.3

STATEMENT OF THE PROBLEM

The magnitude of surgical site infection following cesarean section is increasing correlating with this study. The independent associated factors for surgical site infection after cesarean section associated with this study include Membranes rupture prior to cesarean section, duration of labor and sub umbilical abdominal incision and medical comorbidities.

In addition to ensuring sterile environment and aseptic surgeries, use of WHO surgical safety checklist would appear to be a very important intervention to reduce surgical site infections. Pregnant women are at risk of infection during labor and delivery. Among surgical patients in obstetrics, Surgical Site Infections (SSIs) are the most common nosocomial infections, accounting for 38% of hospital acquired infections.

While the operation is widely embraced and utilized in the developed world, aversion, miseries, misconception, fear, guilt, and anger surround the operation in Nigeria. Reasons for these includes the morbidity and mortality from the operation, prolonged hospital stay, and perceived high cost of hospital bills.

Because these women do not want relations and friends alike to know that they delivered through caesarean section, any factor that will prolong their stay in the hospital is particularly disliked and frowned at. These women have come to associate caesarean section and wound infection with long hospital stay. Attempts to make the operation of caesarean section more acceptable to women in our environment must address these problems. Post caesarean wound infection is the focus in this study.

Though the causes of caesarean wound infection are similar globally with slight regional variations, the relative contribution differ from regions to region and even from centre to centre. In order to control and prevent post caesarean wound infection in our environment there is the need to access the relative contribution of each aetiologic factor.



1.4

RESEARCH QUESTIONS

- 1) Any history of caesarean delivery in the past? If yes how many? At what Centre?
- 2) How many times have you been pregnant? If yes. Carried to term?
- 3) Any history of previous labor complication which lead to an emergency CS? If yes please indicate i) prolonged labor ii) history of poor/abnormal/in adequate contractions iii) prolonged active or latent phase iv) unfavorable cervix v) contracted pelvis vi) CPD/ breech presentation vii) Obstetric complications e.g., GDM, preeclampsia and others.
- 4) History of Personal request for CS
- 5) Referrals
- 6) Any other history not included in the questioner?
- 7) History of post CS complications in the past?
- 8) length of treatment and hospital stay with reasons

1.5

SIGNIFICANCE OF THE STUDY

Approximately 1.3 million women in the United States undergo a cesarean section every year. It is the most common surgery done in the US. Following the first cesarean performed in 1020 AD, that patient died. Medicine has advanced significantly since that time, and it continues to do so.

Understanding the risks and benefits of a cesarean section will allow a clinician to counsel a pregnant patient appropriately. Having a clear understanding of evidence-based medicine will enable clinicians to provide the best care and best possible outcomes. Patients sometimes request a cesarean delivery without other indications, and clinicians should be equipped to provide the significant education needed in these cases to ensure the patient is making an informed decision. There is growing pressure to decrease cesarean section rates, so a proper understanding of the indications will assist clinicians in decision-making.



Coordination and communication between the interprofessional health care team members are crucial to ensuring safety and maximum outcomes in cesarean delivery. Two-thirds of sentinel events have a root cause of failure to communicate. Crew resource management, safety bundles, and checklists have all been utilized to improve safety and communication. At its most fundamental, the surgical “time-out” is a way of ensuring everyone in the operating suite is on the same page. The Joint Commission requires that a time-out take place before all procedures. The Patient Safety Checklist for planned cesarean delivery created by the American College of Obstetricians and Gynecologists is one example of using a checklist to improve safety. This checklist involves all members of the team, including the surgeon, the nurses, the anesthesia team, and the patient, all working together in an interprofessional approach. It includes the following:

- Does the patient have a complete medical history and physical exam?
 - Identification of known allergies
 - Medical factors affecting anesthetic choices
- Has the patient been counseled about risks, benefits, indications, and alternatives?
 - Ensure the consent form is signed
- Are appropriate laboratory results available?
- Has appropriate antibiotic prophylaxis been given?
- Is appropriate deep vein thrombosis prophylaxis being utilized?
- Have the fetal heart tones been confirmed?
- Are there any additional risk factors identified?
 - Bleeding risk
 - Airway
 - Allergies
 - Need for neonatal or pediatric departments
- Has a time-out been conducted, including identification of the patient, allergies, consent, the surgical procedure, and all members of the team and their roles?
- Have laboratory investigation counts been performed prior to incision with available investigations?

1.6

SCOPE AND LIMITATIONS

The scope of this study revealed that contrary to the increasing trend in use of CS in Nigeria and other low-income countries, women in the region of Nigeria had limited access to this intervention. Increasing age and socioeconomic proxies for income and access to care (e.g., having a tertiary-level education, full-time employment, and urban residence) were shown to be key determinants of access to CS.



Long hospital stay in the population study is largely associated pregnancy related comorbidities e.g., preeclampsia, GDM, GTD, etc. Further research is needed to ascertain the obstetric conditions under which women in this region receive CS, and to further elucidate the role of socioeconomic factors in accessing CS.

The **limitations** discussed in detail relates to Maternal complications in this study included preoperative obstetric disorders (eg gestational diabetes, preeclampsia, antepartum haemorrhage and others), anaesthetic complications (eg, infections meningitis, direct needle trauma and vertebral canal hematoma), uterine artery injury, ureteric injury, caesarean hysterectomy, intraoperative haemorrhage, wound infections and postoperative fever. Neonatal complications were LBW deliveries, low APGAR score at one-minute, low APGAR score at 5 min, admission to NICU and neonatal death.

Wound infection was counted in the presence of seropurulent discharges, redness (or both), induration or swelling of wound site, etc.

Postoperative fever was defined as a temperature higher than 38°C (100.4°F).

Post-caesarean endometritis is a clinical diagnosis that includes fever, uterine tenderness and/or purulent lochia requiring antibiotics prescription.

1.7

DEFINITION OF TERMS

CD = CAESEAREAN DELIVERY

CS = CAESEREAN SECTION

GDM = GESTATIONAL DIABETES MELLITUS

CPD = CEPHALOPELVIC DISPROPORTION

NICU = NENONATAL INTENSIVE CARE UNIT

APGAR = APPERARNCE PULSE GRIMACE ACTIVITY RESPITATION

SSIs = SURGICAL SITE INFECTIONS

SSA = SUBSAHARAN AFRICANA

LBW = LOW BIRTH WEIGHT

GTD = GESTATIONAL TROPHOBLASTIC DISEASES

NDHS = NIGERIAN DEMOGRAPHIC HEALTH SURVEY

TOLAC = TRIAL OF LABOR AFTER CAESAREAN SECTION

LoS = LONG HOSPITAL STAY



1.8

HISTORICAL BACKGROUND OF THE STUDY

Caesarean section is defined as an obstetrics surgical procedure in which an incision is made on the anterior abdominal wall and the uterus after the age of viability for the purpose of delivering the fetus (after 28wks GA) WHILE hysterotomy is a surgical incision made on the anterior abdominal wall and uterus for the purpose of delivering the fetus before the age viability (before 28wks GA). The age of viability in Nigeria is considered to be 28wks GA.

INDICATIONS

There are various reasons why a fetus cannot, or should not, be delivered vaginally. Some of these indications are inflexible, as a vaginal birth would be dangerous in certain clinical scenarios. For example, a cesarean delivery is often the recommended approach if the patient has had a prior classical cesarean scar or previous uterine rupture. However, due to the potential complications of cesarean delivery (see below), much study has been done looking for ways to reduce the cesarean rate. For example, the encouragement of women to deliver after first CS (TOLAC).

There has been an emphasis on decreasing the number of first-time caesareans, as many women who have one cesarean delivery will ultimately have the remainder of their children via cesarean. She may choose another cesarean for various reasons, or she may not be a candidate for a subsequent vaginal birth. For example, if that patient has an unfavourable cervix at term, cervical ripening with medications such as misoprostol is not recommended due to an increased risk of uterine rupture with those agents. In the 2011 article "Safe Prevention of the Primary Cesarean Delivery," authors addressed the most commonly documented indications for first-time cesarean deliveries (labor dystocia, abnormal fetal heart rate pattern, malpresentation of the fetus, multiple gestations, and suspected fetal macrosomia) and mitigation of how these factors.

Maternal Indications for Cesarean

- Prior cesarean delivery
- Maternal request
- Pelvic deformity or cephalopelvic disproportion
- Previous perineal trauma
- Prior pelvic or anal/rectal reconstructive surgery
- Herpes simplex or HIV infection
- Cardiac or pulmonary disease
- Cerebral aneurysm or arteriovenous malformation
- Pathology requiring concurrent intraabdominal surgery
- Perimortem cesarean



Uterine/Anatomic Indications for Cesarean

Abnormal placentation (such as placenta previa, 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
- Permanent cerclage

Fetal Indications for Cesarean

- Nonreassuring fetal status (such as abnormal umbilical cord Doppler study) or abnormal fetal heart tracing
- Umbilical cord prolapse
- Failed operative vaginal delivery
- Malpresentation
- Macrosomia
- Congenital anomaly
- Thrombocytopenia
- Prior neonatal birth trauma

There are contraindications to CS which will further be discussed. It is understandable and justifiable for a woman to have high expectations for the outcome of her delivery and therefore opting for a caesarean delivery. The goal of reducing cesarean rates may be difficult to achieve, considering this hesitance to expose the fetus to risk.

With the rate of increase in caesarean deliveries and increased fetal outcomes maternal morbidity and mortality has been contained to an extent. However, the length of hospital stay is longer with C/S especially when associated with pre, intra and post-partum complications.



CHAPTER 2

THE THEORETICAL FRAMEWORK ON WHICH THE STUDY IS BASED, THUS THE REVIEW OF RELATED LITERATURE.

2.1

CONTRAINDICATIONS TO C/S

There are no true medical contraindications to the cesarean section. A cesarean is an option if the pregnant patient is in a critical health condition or dying or if the fetus is compromised or dying. While there are ideal conditions for cesarean, such as the availability of anesthesia and antibiotics, and appropriate equipment, the absence of these is not a contraindication if the clinical scenario dictates.

Ethically, a cesarean is contraindicated if the pregnant patient refuses. Adequate education and counselling are crucial for informed consent. However, if the pregnant patient does not consent to have surgery performed upon her body, ultimately, it is her right as an autonomous patient.

There are some clinical scenarios in which a cesarean delivery may not be the preferred option. One could consider these relative contraindications. For example, a pregnant patient may have severe coagulopathy, which makes surgery extremely dangerous. In that case, vaginal delivery may be preferable. Alternatively, a patient with an extensive history of abdominal surgery may also be a poor surgical candidate. In the event of fetal demise, performing a cesarean exposes the pregnant patient to the risks of SSI without any fetal benefit. The same considerations apply if the fetus has severe anomalies that are incompatible with life.

2.2

EQUIPMENTS FOR C/S

The equipment required for a cesarean delivery varies based on the clinical scenario. At the most basic level, the only thing necessary is some cutting instrument. In an emergency, a physician could theoretically perform a perimortem cesarean delivery on a woman after a car accident with a sharp piece of glass.

Luckily, such emergency scenarios are rare. Various consumable and reusable items are utilized to make a cesarean safer for the surgeon, the pregnant patient, and the fetus. Again, the clinical scenario dictates the equipment used.

The surgical suite should have a surgical bed or table, which can move up and down based on the surgeon's needs. Associated with the surgical table are the rests for the patient's arms, a safety strap or belt to ensure the patient does not fall off the table, and some ramp (or even a rolled blanket) to achieve left lateral tilt of the patient. Surgical step stools should be available for the surgeon and assistant(s).

A blanket warmer is often present in the operating room suite. This device provides warming for both the patient and the neonate. An indwelling catheter is usually placed in the patient's bladder before the surgery. The operating room should also have overhead lighting to provide adequate illumination of the surgical field.



Most consumables commonly utilized during surgery often get stored in the surgical suite, including sutures, gloves, gowns, wound dressings, and hemostatic agents.

Once the patient is on the surgical table, a surgical drape maintains the sterile surgical field - this can either be fenestrated or not fenestrated around the patient's abdomen. It usually contains lateral pouches to catch amniotic or other fluids. The drape is usually secured to two poles on either side of the patient's shoulders, obscuring the patient's view of the surgical field. Clear drapes are also available, allowing the patient to watch the surgery and subsequent delivery of the infant, if need be. Many hospitals may have a standardized "surgical pack" specific to cesarean delivery, and this pack may contain the necessary drapes. It may also contain surgical towels, a bulb suction, umbilical cord clamps, suction tubing, or other consumables specific to a cesarean.

At the head of the surgical table is the anesthesia equipment, which includes monitors for patient vital signs, organizational cabinets, medications for achieving adequate anesthesia, and airway equipment. Even though cesarean deliveries usually take place with a regional anesthetic, general anesthesia can be necessary. Therefore, all equipment needed for obtaining and maintaining a patient's airway should be readily available.

Most hospitals have a standardized "surgical tray" specifically for cesarean sections. This tray contains the surgical instruments traditionally used during the procedure and may vary by region or hospital. This tray may include several kinds of scissors (bandage, Metzenbaum, straight and curved Mayo), several kinds of clamps (Kelly, Kocher, Allis, Babcock), sponge forceps, several kinds of tissue forceps (Adson, Russian, Ferris Smith, smooth), retractors (bladder blade, Army Navy, Doyens, Richardson), knife handles, needle drivers, suction (Yankauer or Poole), or other instruments.

The availability of a standardized surgical pack and cesarean instrument tray can be beneficial. For example, if an emergency cesarean is needed, this will mitigate the time-consuming need to gather appropriate equipment. In addition to standard instrument trays for the cesarean section, a hysterectomy instrument tray should also be available. A peripartum hysterectomy is relatively rare, but it is becoming more common. Having the appropriate instruments readily accessible can save precious time in an emergency.

2.3

PERSONNEL

The primary personnel for a cesarean section consist of:

- The surgeon
- The surgeon's assistant
- The anesthesiologist or anesthetist
- A scrub nurse or technician
- A circulating nurse
- Someone to care for the neonate



A nurse, nurse practitioner, or physician can assume care of the neonate after delivery. He/she performs the initial resuscitation of the newborn, including assessment and warming. If the neonate is expected to be significantly preterm or need specialized care (birth defects, drug exposures, etc.), additional staff to care for the newborn is often required. This care may include nurse practitioners or physicians from the neonatal intensive care unit. In some practice settings or scenarios, the primary surgeon or anesthesiologist may be called upon to assist in the care of the newborn

2.4

TECHNIQUE FOR C/S

The cesarean section is a complicated procedure. Appropriate tissue handling, adequate haemostasis, avoiding tissue ischemia, and preventing infection are essential for wound healing and reducing subsequent adhesion formation. During the surgery itself, several techniques are utilizable at each step or tissue layer. Many factors contribute to a surgeon's decisions on technique. As with any aspect of medical practice, basing those decisions on evidence is recommended.

Cesarean Delivery Techniques

- Pfannenstiel-Kerr method
- Joel-Cohen method
- Misgav-Ladach method
- Modified Misgav-Ladach method

Before cesarean, the pubic hair may be removed or not. Those advocating for hair removal claim a decrease in surgical site contamination and infection. However, a Cochrane review did not show lower infection rates with hair removal. Therefore, hair removal should only occur if it provides improved visualization. If opting for hair removal, it should be with clippers rather than razors. Patients should also be discouraged from shaving their pubic area as they approach their due dates or schedule cesarean dates. Shaving with a razor may cause microscopic skin breaks that are associated with more surgical site infections compared to clipping.

The initial skin incision can be made either in a suprapubic transverse or midline vertical fashion. A vertical midline incision is considered to provide faster access to the abdominal cavity, and it disrupts fewer tissue layers and vessels, leading to many citations as the preferred method to perform an emergency cesarean. A vertical incision may also allow visualization away from known severe adhesive disease. In the case of a planned cesarean hysterectomy for a morbidly adherent placenta, a vertical incision may provide more surgical exposure, as well as access to the hypogastric arteries. However, a transverse skin incision is the most commonly used and is preferable in most cases due to improved wound healing and patient tolerability. Because most clinicians are more adept at low-transverse cesarean entry, this technique is often utilized even in emergency scenarios. Unplanned cesarean hysterectomies can take place through a low transverse incision. Patient habitus may lead some surgeons to place a transverse skin incision higher on the abdomen, rather than underneath the pannus, though research is not yet definitive on this technique.



A Pfannenstiel skin incision is slightly curved and is located 2 to 3 centimetres or 2 fingerbreadths above the symphysis pubis. The midportion of the incision is within the hair-bearing area of the mons. The hair should be removed in this case. A Joel-Cohen incision, in contrast, is straight rather than curved. It is 3 cm below the line connecting the anterior superior iliac spines, making it more cephalad than a Pfannenstiel skin incision.

The uterus incision can be either transverse or vertical. For most caesareans, a low transverse incision is preferable. Compared to a classical incision, and low transverse incision causes less bleeding, is easier to repair, and causes less adhesion formation.

The following is a summary of the four general operative methods:

Pfannenstiel-Kerr Method

- Pfannenstiel skin incision
- Sharp dissection of the subcutaneous layer
- Sharp extension of the fascial opening
- Sharp entry into the peritoneum
- Sharp superficial then blunt entry into the uterus
- Manual removal of the placenta
- Single-layer interrupted closure of the uterus
- Closure of the peritoneum
- Interrupted closure of the fascia
- Continuous suture of the skin

Joel-Cohen Method

- Joel-Cohen skin incision
- Blunt dissection of the subcutaneous layer
- Blunt extension of the fascial opening
- Blunt entry into the peritoneum
- Sharp superficial then blunt entry into the uterus
- Spontaneous removal of the placenta
- Single-layer interrupted closure of the uterus
- Non-closure of the peritoneum
- Interrupted closure of the fascia
- Continuous suture of the skin



Misgav-Ladach Method

- Joel-Cohen skin incision
- Blunt dissection of the subcutaneous layer
- Blunt extension of the fascial opening
- Blunt entry into the peritoneum
- Sharp superficial then blunt entry into the uterus
- Manual removal of the placenta
- Single layer running closure of the uterus
- Non-closure of the peritoneum
- Continuous closure of the fascia
- Mattress suture closure of the skin

Modified Misgav-Ladach Method

- Pfannenstiel skin incision
- Blunt dissection of the subcutaneous layer
- Blunt extension of the fascial opening
- Blunt entry into the peritoneum
- Sharp superficial then blunt entry into the uterus
- Spontaneous removal of the placenta
- Single layer running closure of the uterus
- Closure of the peritoneum
- Continuous closure of the fascia
- Continuous suture of the skin

THE RESEARCH DESIGN AND METHODOLOGY ADOPTED IN THE STUDY.

In the course of this review data was collected from one of the best training hospitals in the region with the best obstetric consultants always on hand to help when called on, even in emergency situations. A total of 78 patients were included in this study, these patients were already term pregnancy and emergency obstetric patients who were admitted through the emergency and on referrals.

A total of 35 cases were delivered via the caesarean delivery, while 43 cases of SVD but about 28 cases came down with complications which lead to longer hospital stay and ICU admissions. Because of inherent risks associated with having multiples (i.e., twins, triplets etc.), only women between the ages of 17–45 at baseline, who had singleton deliveries, were retained for this analysis. The length of pregnancy at baseline was not ascertained.

Participants remained in the study until post-delivery. Post-delivery questionnaires were used to ascertain the mode of delivery, i.e., CS or vaginal birth, and singleton or multiple deliveries. Gravidity was dichotomized as primigravida and multigravida. Overall, 76.6% (n = 78) of participants who gave informed consent answered questions regarding their mode of delivery (Control n = 42; Intervention n = 35).

Only women who answered the question regarding mode of delivery on the post-delivery questionnaire were retained for the analysis described within. However, not all women had complete data on socioeconomic and comorbid conditions; therefore, only 68 women were retained for the analysis described.

Below is described the maternal and neonatal characteristics of patients delivered from C/S

Variables		Median	Interquartile Range
Age group, years		28.0	24.0–32.0
Parity		3	2–3
Number of previous caesarean delivery		2	1–2
Gestational age, weeks		38.0	38.0–38.0
Body mass index, kg/m ²		25.7	24.0–27.7
Birth weight, gm		3000	2700–3000
		Frequency	Proportion
Type of caesarean delivery	Emergency	111	20.4
	Elective	433	79.6
Education	≥ secondary level	176	32.4
	< secondary level	368	67.6
Occupation	Employee	49	9.0
	Housewives	495	91.0
Residence	Rural	289	53.1
	Urban	255	46.9
Maternal complications:			
Obstetric disorders (gestational diabetes, preeclampsia, antepartum hemorrhage and others).	Yes	21	3.9
	No	523	96.1
Anaesthetic complications	Yes	3	0.6
	No	541	99.4
Uterine artery injury	Yes	3	0.6
	No	541	99.4
Ureteric injury	Yes	1	0.2
	No	543	99.8
Caesarean hysterectomy	Yes	2	0.4
	No	542	99.6
Intraoperative haemorrhage	Yes	9	1.7
	No	535	98.3
Wound infections	Yes	8	1.5
	No	536	98.5
Postoperative fever	Yes	21	3.9
	No	523	96.1
Gender of newborn	Male	291	53.5
	Female	253	46.5
Neonatal complications:			
Low birth weight deliveries	Yes	46	8.5
	No	498	91.5
Low PGAR score at 1 min	Yes	14	2.6

The median (interquartile range, IQR) of their age and parity was 28.0 (24.0–32.0) years and 3(2–3), respectively. Around one-third (32.4%) of them had \geq secondary level of education. The majority (91.0%) of these 544 women were housewives. Over half of them (53.1%) resided in rural areas. Almost four out of five (79.6%) had elective CD, and all had spinal anaesthesia. The median (IQR) of the postoperative haemoglobin was 10.3.

Univariate Analysis of the Factors Associated with Length of Stay Post-Cesarean Delivery

Variables			
Spearman correlations			
		<i>r</i>	P
Age group, years		0.090	0.035
Parity		0.035	0.421
Gestational age, weeks		– 0.047	0.270
Body mass index(kg/m ²)		0.096	0.025
Post-operative hemoglobin, g/dl		–0.159	<0.001
Mann–Whitney U			
Median (interquartile range) P			
Education	\geq Secondary level	3 (2.0–3.0)	0.615
	< Secondary level	3 (2.0–3.0)	
Occupation	Employee	3 (2.0–3.0)	0.854
	Housewives	3 (2.0–3.0)	
Residence	Rural	3 (2.0–3.0)	0.784
	Urban	3 (2.0–3.0)	
Maternal complications	Yes	3 (2.0–3.0)	<0.001
	No	3 (2.0–3.0)	
Neonatal complications	Yes	3 (3.0–3.75)	<0.001
	No	3 (2.0–3.0)	
Type of cesarean delivery	Emergency	3 (3.0–3.0)	<0.001
	Elective	3 (2.0–3.0)	

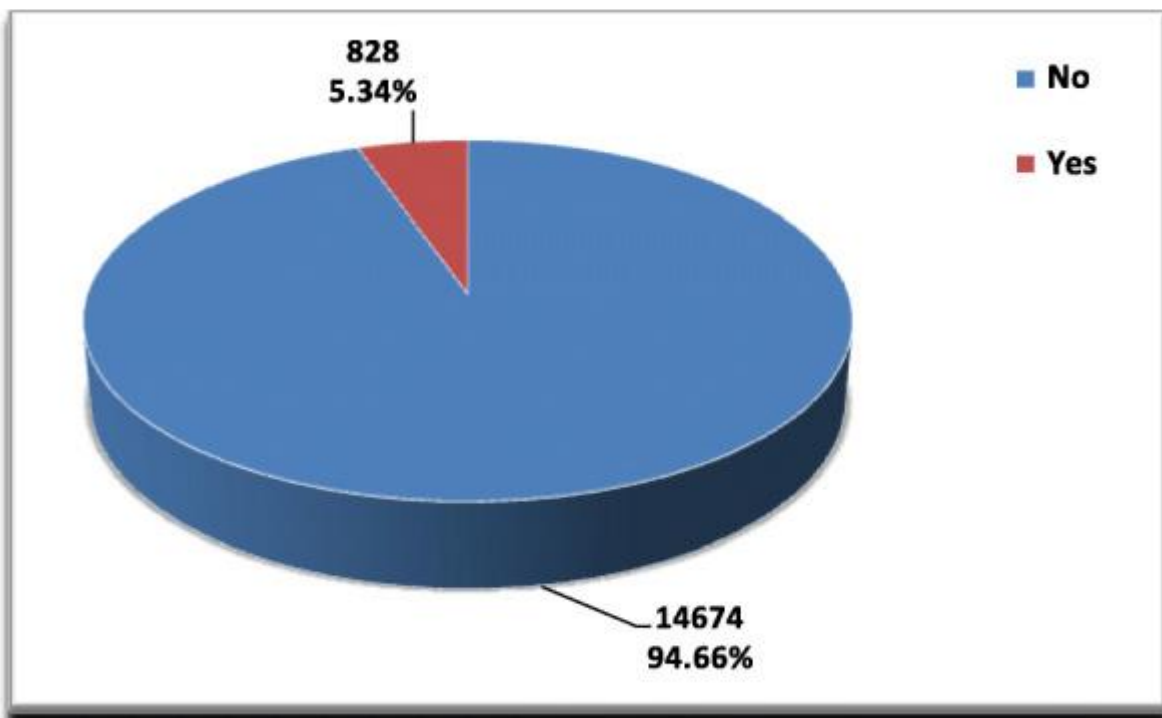
Sixty-eight (12.5%) of these women had maternal complications. There were obstetric disorders (21, 3.9%), anaesthetic complications (3, 0.6%), uterine artery injury (3, 0.6%), ureteric injury (1, 0.2%), caesarean hysterectomy (2, 0.4%), intraoperative haemorrhage (9, 1.7%), wound infections (8, 1.5%) and postoperative fever (21, 3.9%). Only 8.8% of these women had two or more complications. There was no case of endometritis. There was no maternal death.

There were significant positive correlations related to age, BMI and LoS. There was a significant negative correlation between postoperative haemoglobin and LoS. There was no significant correlation between parity, gestational age and LoS.

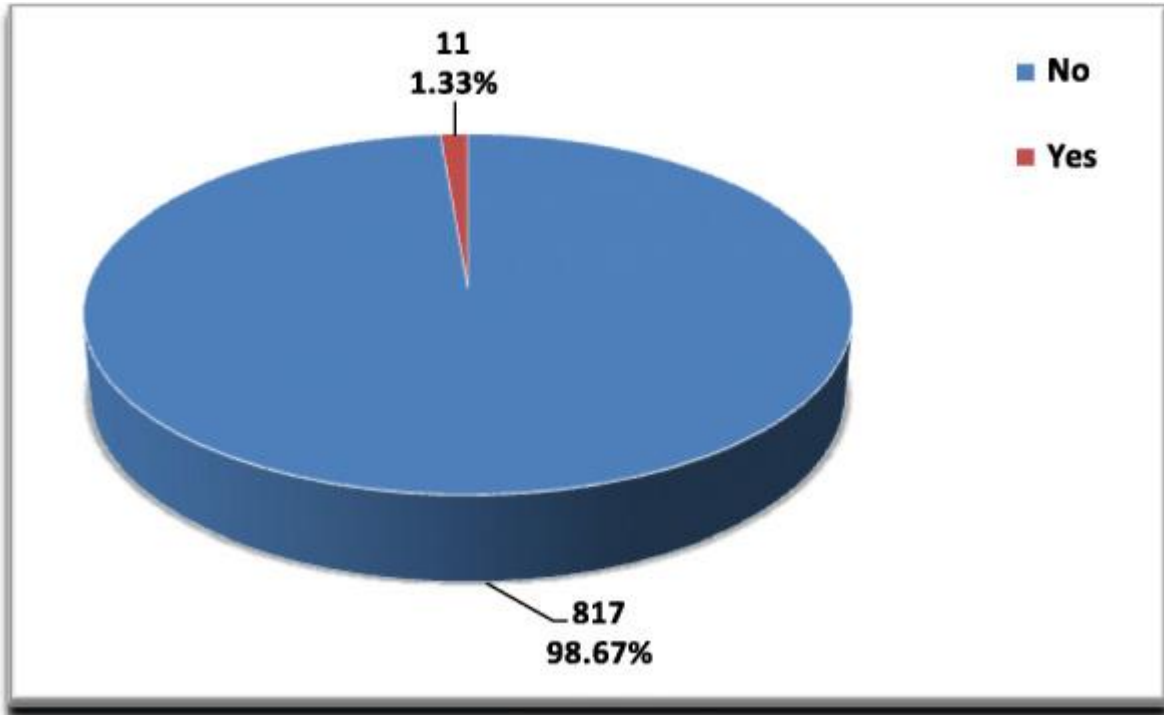
THE DATA COLLECTION, ANALYSIS AND DATA PRESENTATION

Surgical site infection (SSI) is one of the commonest complications following cesarean section (C/S) with a reported incidence of 3-20%. SSI causes massive burdens on both the mother and the health care system. Moreover, it is associated with high maternal morbidity and mortality rate of up to 3%. This study aims to determine the incidence of long hospital stay with risk factors and management following CS in a tertiary hospital.

SSIs amongst C/S pie chart representation.



The incidence of SSI post-cesarean section was 5.34%. Significant risk factors for SSI were; chorioamnionitis (adjusted odds ratio (AOR) 4.51; 95% CI =3.12-6.18), premature rupture of membranes (PROM) (AOR 3.99; 95% CI =3.11-4.74), blood loss of > 1000 ml (AOR 2.21; 95% CI =1.62-3.09), emergency CS (AOR 2.16; 95% CI =1.61-2.51), duration of CS of > 1 h (AOR 2.12; 95% CI =1.67-2.79), no antenatal care (ANC) visits (AOR 2.05; 95% CI =1.66-2.37), duration of labor of \geq 24 h (AOR 1.45; 95% CI =1.06-2.01), diabetes mellitus (DM) (AOR 1.37; 95% CI =1.02-2.13), obesity (AOR 1.34; 95% CI =0.95-1.84), high parity (AOR 1.27; 95% CI = 1.03-1.88), hypertension (AOR 1.19; 95% CI = 0.92-2.11) and gestational age of < 37 wks (AOR 1.12; 95% CI = 0.94-1.66). The mortality rate due to SSI was 1.33%.



Having a CS in previous pregnancies is known to predict current CS; therefore, gravida was included in logistic regression models. Because no information was collected specifically regarding previous CS, a sensitivity analysis was performed among those experiencing their first pregnancy. Statistical significance was set at $p < 0.05$. An adjusted trend in the Odds Ratio (OR) was conducted to determine whether there was an increasing trend in the odds of having a CS as a participant's age and education level increased.

In this study of 78 patients, 36 patients had C/S while 39 patients delivered via spontaneous vaginal delivery. Complications were recorded differently to different and various groups, but more complications and the resultant long hospital stay were associated with patient who delivered via C/S, although some cases of PPH and perineal lacerations were common amongst patients delivered via SVD, however there are quantum of complications recorded with patient that had caesarean delivery which comprised patients' recovery and hospital stay.

DYSTOCIA: Dystocia in labor (labor dystocia) is a very commonly cited indication for cesarean delivery, but it is not specific. Dystocia is classified as a protraction disorder or as an arrest disorder. These can be primary or secondary disorders. Most dystocia's are caused by abnormalities of the power (uterine contractions), the passage (maternal pelvis), or the passenger (the fetus). When a diagnosis of dystocia in labor is made, the indication should be detailed according to the previous classification (i.e., primary or secondary disorder, arrest or protraction disorder, or a combination of the above). For further information, see [Abnormal Labor](#).



Furthermore, complications more frequently managed in the southeastern region includes cases referred to the tertiary institutions as obstetric emergencies; 2 cases of VBAC, more cases of SSI (infected episiotomies, puerperal sepsis, IUFD, vaginal infections) were recorded, most of the complications associated with long hospital stay after C/S includes (preeclampsia, PIH, severe preeclampsia and eclampsia with and without seizures, PPH, IUFD, AKI, placental insufficiencies e.g. (placenta previa, abruption placentae, adherent placenta) RVD, HbsAg, uterine fibroids, paralytic ileus, complicated and cerebral malaria). Some of these complications required extensive medical and intensive unit care with administration of intranasal oxygen.



CHAPTER 5

SUMMARY, CONCLUSION, AND RECOMMENDATIONS MADE OF THE STUDY.

5.1 SUMMARY

- a) A caesarean section is a surgical procedure in which a baby is born through a cut made in the mother's abdominal wall and uterus.
- b) A baby will need to be born by caesarean section if there are serious problems that prevent the baby being born by a normal vaginal birth.
- c) Caesarean section is a relatively safe operation; however, possible complications include infection, damage to your internal organs, an increased risk of respiratory distress for your baby and complications with future pregnancies.

ACOG has recommended that any facility providing obstetric care should have the capability of performing a cesarean delivery within 30 minutes of the decision. Despite this recommendation, a decision to delivery time of more than 30 minutes is not necessarily associated with a negative neonatal outcome.

Recently, debate has arisen over the option of elective cesarean delivery on maternal request (CDMR). Evidence shows that it is reasonable to inform the pregnant woman requesting a cesarean delivery of the associated risks and benefits for the current and any subsequent pregnancies. The clinician's role should be to provide the best possible evidence-based counseling to the woman and to respect her autonomy and decision-making capabilities when considering route of delivery. In 2006, the National Institutes of Health (NIH) convened a consensus conference to address CDMR. They resolved that the evidence supporting this concept was not conclusive. Their recommendations included the following:

- CDMR should be avoided by women wanting several children.
- CDMR should not be performed before the 39th week of pregnancy or without verifying fetal lung maturity.
- CDMR has a potential benefit of decreased risk of hemorrhage for the mother and decreased risk of birth injuries for the baby.
- CDMR has a potential risk of respiratory problems for the baby.
- CDMR is associated with a longer maternal hospital stay and increasing risk of placenta previa and placenta accreta with each successive cesarean.

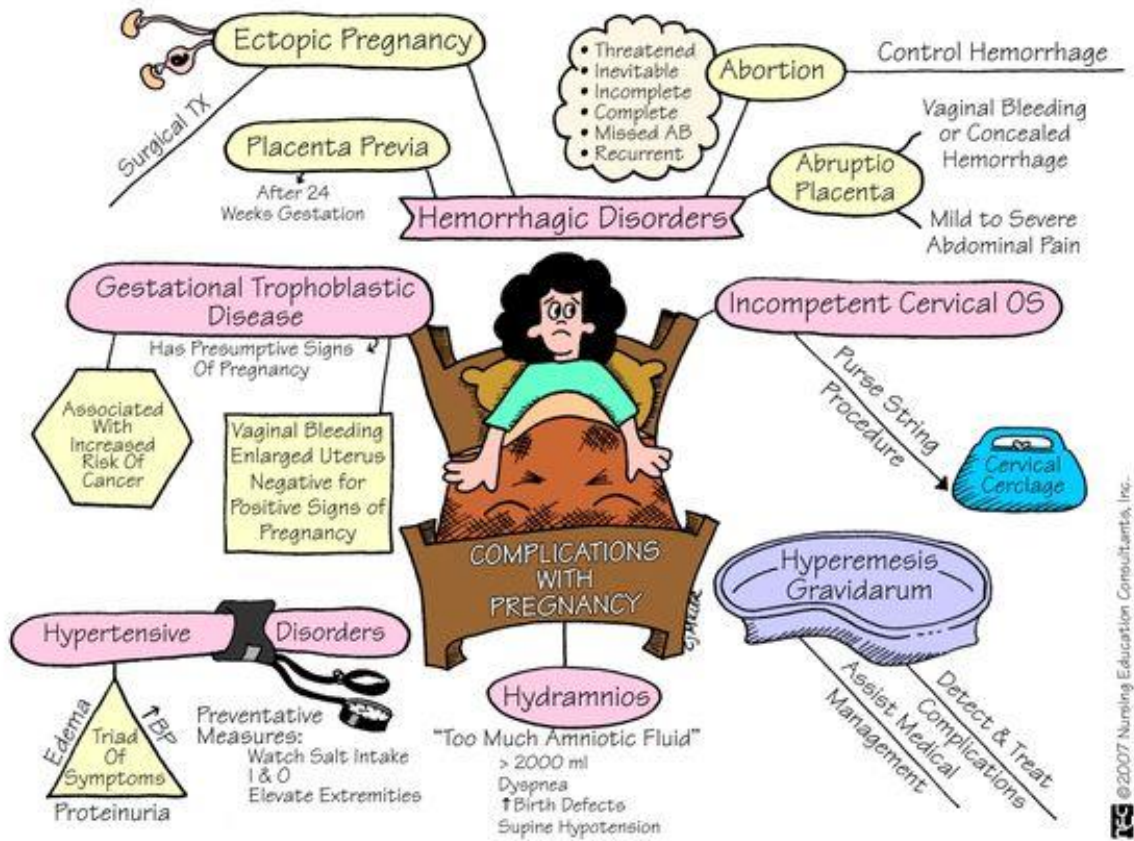
The NIH further noted that the procedure requires individualized counseling by the practitioner of the potential risks and benefits of both vaginal and cesarean delivery, and it should not be motivated by the unavailability of effective pain management.

Detractors of CDMR argue that the premise of cesarean on request applies to a very small portion of the population and that it should not be routinely offered on ethical grounds. The emerging consensus is that a randomized prospective study is required to address this issue.



caesarean delivery of the fetal head.

CONCLUSION



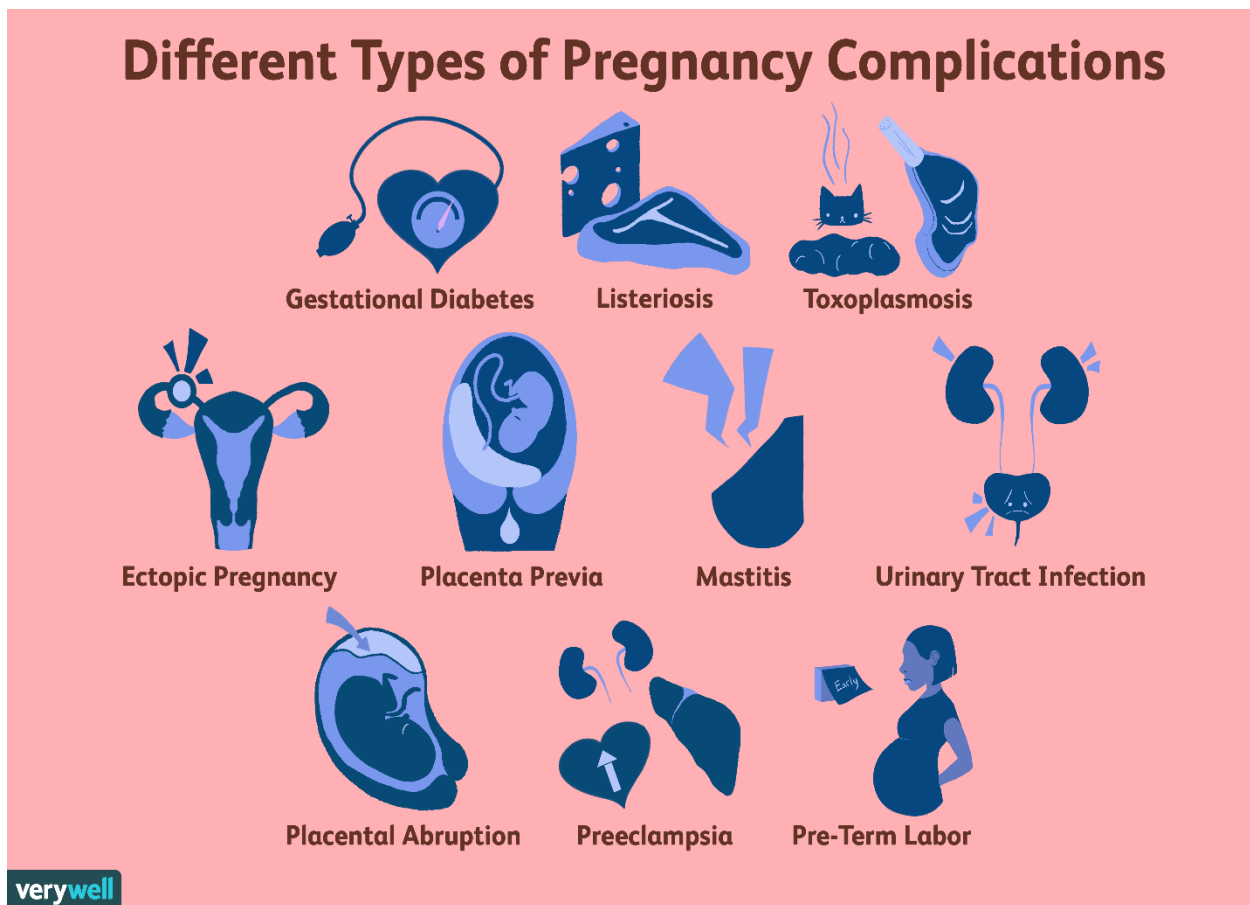
There are substantial differences in a woman’s availability to caesarean sections depending on where she lives in the southeastern states and either rural or urban with the level of education. In Nigeria, the problem of affordability and access is especially difficult in rural regions, where about 58 percent of births are performed by inexperienced birth attendants, the Government and Non-governmental agencies will need to assist in other to make this procedure affordable and accessible to rural communities that constitute a large number of the deliveries and maternal mortality. The direct effect of maternal complications on LoS was observed in our results and the results of several prior studies. Perinatal complications, such as LBW.

Furthermore, more actions are needed to minimise maternal and perinatal complications and shorten LoS. One of the factors that might shift C/D towards elective ones and reduce maternal and perinatal complications is antenatal care. We did not assess antenatal care in this study. However, an inadequate level of antenatal care was observed in southeastern states of Nigeria. We did not observe a significant association among age, parity, BMI, residence, education and LoS. Age, parity, residence, educational level, and obesity were shown to be associated with LoS in previous studies.

In conclusion, rates of CS remain substantially lower in Nigeria than suggested by the WHO Working Group on Caesarean Section. Findings from this study reveal that contrary to the increasing trend in use of CS in low- and middle-income countries and globally, the rate of CS among women in the study setting was low. Further research is needed to ascertain the obstetric conditions under which women in this region receive CS and subsequent long hospital stay.

5.3

RECOMMENDATIONS



There is an increasing caesarean delivery (CD) rate globally (from 7% in 1990 to 21% in 2021) and in the sub-Saharan region in particular (from 3.2% in 2012 to 5.9% in 2021). Compared with vaginal delivery (SVD), CD is associated with increased maternal and perinatal morbidity and mortality rates. One of these factors is associated with prolonged length of stay (LoS) in the hospital, which is reported to be longer in CD than SVD.

Although that nosocomial infections were not recorded during this study, all types of post-caesarean infection, except asymptomatic bacteriuria, caused the duration of the post-partum hospital stay to be significantly increased.

Independent risk factors were identified for increased risk of surgical site infection on this study, Such as, prolonged labor, rupture of membrane before cesarean section and types of abdominal incision.

Therefore, to reduce surgical site infection the hospital infection control system as well as surgical site infection surveillance program has to be established. In addition, sterile environment and aseptic surgeries, use of WHO surgical safety checklist would appear to be a very important intervention to reduce surgical site infections.

Variable	n (%)
	17 ^a
Complications during pregnancy (n, %)	
Hypertension ^b	11 (64.7)
Pre-eclampsia	5 (29.4)
Use of magnesium sulfate (severe features)	2 (11.8)
Gestational diabetes	1 (5.9)
Dialysis ^c	1 (5.9)
Intensive care unit admission	4 (23.5)
Fetal growth restriction	4 (23.5)
Postpartum infection	2 (11.8)

A: Two pregnancies that ended as 1st trimester miscarriage were excluded. B: Hypertension included chronic hypertension, gestational hypertension, and preeclampsia. C: In the postpartum period; no cases were reported during pregnancy.

Considering that the length of hospital stay of patients for similar reasons is heterogeneous, that is, there is a coefficient of variation due to the differences in the care offered by the various health institutions and to the diversity in the patients' individual characteristics, especially their complications and comorbidities, the objective of the study was to evaluate the impact of these clinical conditions and age group on the length of hospitalization of women undergoing cesarean section.



The determination of the influence of factors that are intrinsic to the patient on the length of hospital stay provides the opportunity to implement safe care management mechanisms, based on indicators of clinical risk adjustment to the length of hospitalization for cesarean section.

REFERENCES.

- 1)Caesarean section rates continue to rise, amid growing inequalities in access (World Health Organization). Available from: <https://www.who.int/news/item/16-06-2021->. Accessed March 5, 2022.
- 2) Oyeyemi N, Oyeneyin L, Oluwole A, Oyeyemi A, Afolabi B. Post-operative management in uncomplicated caesarean delivery: a randomised trial of short stay versus traditional protocol at the Lagos University Teaching Hospital, Nigeria. *Niger Postgrad Med J.* 2019;**26**(1):31–37.
- 3) Length of hospital stay after childbirth in sub-Saharan Africa, and it's associated factors in low- and middle-income countries: compilation of reported data and a cross-sectional analysis from nationally representative surveys. *PLoS Med.* 2019. Ministry of health survey.
- 4) Caughey AB , Cahill AG , Guise JM , Rouse DJ ; American College of Obstetricians ; Society for Maternal-Fetal Medicine . Safe prevention of the primary cesarean delivery . *Am J Obstet Gynecol .* 2014 ; 210 (3) : 179 - 93 .
- 5)comprehensive textbook of obstetrics and gynecology , chapt 42, pg 346-352
- 6) UNICEF. Low birthweight: Country, regional and global estimates - UNICEF DATA. Available from: <https://data.unicef.org/resources/low-birthweight-country-regional-and-global-estimates/>. Accessed December 13, 2021.
- 7)Dr. Chude J; Prevalence, indications, and community perceptions of caesarean section delivery in Anambra state, southeastern district of Nigeria: mixed method study. *Obstet Gynecol Int.* 2021;2022