

**THE BURDEN OF LABOUR AND DELIVERY-RELATED COMPLICATIONS  
AMONG PREGNANT WOMEN AT MOKOPANE HOSPITAL OF LIMPOPO  
PROVINCE**

**by**

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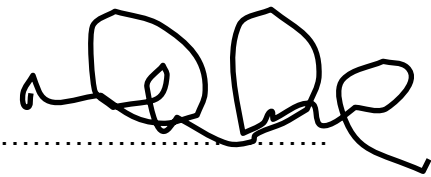
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## DECLARATION

I, Mabore Ameliah Seabi, declare that **THE BURDEN OF LABOUR AND DELIVERY RELATED COMPLICATIONS AMONG PREGNANT WOMEN AT MOKOPANE HOSPITAL OF LIMPOPO PROVINCE** is my work and that all the sources that I used or quoted have been indicated and acknowledged by means of complete references and that this work has not been submitted before for any other degree at any other institution.

A handwritten signature in black ink, consisting of several loops and a long horizontal stroke at the end, positioned above a dotted line.

**Signature**

15 August. 2021

**Date**

## **DEDICATION**

This research is dedicated to my late mother, Mathema Christinah Seabi who has been my number one supporter since I started this academic journey and for instilling in me that great things come through perseverance. Her motivation, guidance, words of wisdom, encouragement and love provided helped me extremely.

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## **ABSTRACT**

The burden of labour and delivery-related complications are health problems that are life-threatening for the fetus and pregnant women. Mokopane hospital in Waterberg of Limpopo Province reports many maternal health complications. There has not been an investigation into the burden of delivery complications and therefore this study aims to investigate the burden of labour and delivery complication experienced by women giving birth at Mokopane hospital of Limpopo province.

**Purpose:** of this study was to explore the burden of labour and delivery-related complications among pregnant women at Mokopane hospital of Limpopo province.

**Methods:** A cross-sectional, retrospective descriptive study was conducted. The study followed a quantitative approach and the researcher completed a questionnaire using clinical records from all delivery files of mothers delivered at maternity between January 2017 to December 2019 Mokopane hospital.

**Findings:** The major finding of this study was the majority of women were at a low risk of pregnancy (69%) followed by a high risk of pregnancy (24%). The study further revealed that (73.7%) of women at Mokopane hospital were delivered through the normal vaginal procedure and (25.8%) delivered through Caesarean section. Moreover, about 86% of the mothers were normal after delivery whilst 14% were sick or had complications.

**Conclusion:** This study, therefore, recommends that educational programs about labour and delivery-related complications and related programs should be prioritised for pregnant women.



## KEY CONCEPTS

**The burden:** Is the intensity or severity of disease and its possible impact on daily life (Gidron 2013). In the context of this study, the burden will refer to the death and loss of health due to labour and delivery-related complications among pregnant women at Mokopane hospital of Limpopo Province.

**Labour:** This is the process of rhythmic uterine contractions which results in cervical dilatation, a descent of the presenting part; and delivery of the fetus, placenta, and membrane. (Anthony & Van Der Spuy, 2002; Clark, Van de Velde, & Fernando, 2016). In the context of this study, labour will be defined as a physiologic process during which the fetus, membranes, umbilical cord, and placenta are expelled from the uterus.

**Delivery related complication:** Is an acute condition arising from a direct cause of maternal death, such as antepartum or postpartum haemorrhage, obstructed labour, postpartum sepsis, a complication of abortion, pre-eclampsia or eclampsia, ectopic pregnancy and ruptured uterus, or indirect causes such as anaemia, malaria and tuberculosis. (WHO, 2018). In the context of this study, delivery related complications will include amongst others severe antenatal bleeding, Postpartum haemorrhage, non-convulsive hypertensive disorder of pregnancy (pre-eclampsia), Eclampsia: pre-eclampsia plus convulsions, Convulsions, Prolonged labour, Premature rupture of the membranes, Retained placenta.

**Pregnant women:** Is a woman who is in the period from conception to birth in which the egg is fertilised by a sperm and then implanted in the lining of the uterus then develops into the placenta and embryo, and later into a foetus (Martin, 2015). In the context of this study, a pregnant woman will be described as a woman who is carrying a developing embryo or fetus within her body.

## ACRONYMS

ANC	Antenatal care
CARMMA	Campaign on accelerated reduction of maternal and child mortality in Africa
CS	Caesarean section
CTG	Cardiotocography
FHR	Fetal heart rate
LMICs	Low and middle-income countries
MLUs	Midwife-led units
MNM	Maternal near miss
MSL	Meconium stain liquor
PPH	Postpartum haemorrhage
PROM	Premature rupture of membrane
PTD	Preterm delivery
SPL	Slow progress of labour
WHO	World Health Organization

## CHAPTER 1

### GENERAL ORIENTATION OF THE STUDY

#### 1. INTRODUCTION AND BACKGROUND

Globally, approximately 9.5 million women suffer from pregnancy-related complications, and over 300,000 dies annually (Ramatu & Yohanna, 2017). Haemorrhage, eclampsia, prolonged or obstructed labour, puerperal sepsis and abortion-related deaths are the main causes of maternal death (Say, Chou, Gemmill, Tunçalp, Moller et al., 2014). Recent research has focused on severe acute obstetric complications to elucidate risk factors and potential strategies for the prevention of maternal mortality and severe morbidity. Similar to the major causes of maternal mortality, haemorrhage, hypertensive disorder of pregnancy, obstructed labour and sepsis are the leading severe obstetric complications in developing countries (Louis, Menard, & Gee, 2015).

Access to comprehensive emergency obstetric care, including caesarean section, is key to preventing the estimated 287 000 maternal and 2.9 million neonatal deaths that occur worldwide every year (Neuman, Alcock, Azad, Kuddus, Osrin et al., 2014). A study conducted by Monjurul (2011) indicates that the burden of labour and delivery-related complications are health problems that are life-threatening for the fetus and pregnant women. Things may start normally during pregnancy but risk develops when the labour progress (World Health Organization, 2018). This is sometimes called a maternal near-miss and they happen any time during pregnancy, labour and birth (WHO, 2009; Knight, Acosta, Brocklehurst, Cheshire, Fitzpatrick et al., 2016). Furthermore, labour and delivery complications that may arise are pre-eclampsia/eclampsia, poor progress of labour, injuries to the genital tract, umbilical cord prolapse/presentation, abnormal heart rate of the fetus, premature rupture of membrane, shoulder dystocia, and postpartum haemorrhage (WHO, 2018).

Similar to the major causes of maternal mortality, haemorrhage, hypertensive disorders of pregnancy, obstructed labour, complications of induced abortion, and sepsis are the leading severe obstetric complications in developing countries (Sikder, Labrique, Ullah, Ali, Rashid et al., 2011). As maternal deaths have been decreased worldwide, attention is placed on obstetric complications and approximately 9.5 million women around the world suffer from pregnancy-related complications and over

300,000 die and in that case, attention is given to those obstetric complications so that improvements can be made in maternal health (Sikder et al., 2011). A study by Hoque (2011) shows that pregnancy complications during pregnancy are common and estimated between 15 and 25 for every 100 deliveries in the USA.

In Africa, women have easy access to maternity services and essential obstetric care, but many develop life-threatening complications of pregnancy and the fatality rate associated with complications are quite high especially in West African (Hollander 2001). Maternal mortality remains a serious problem in low and middle-income countries (LMICs) which account for 99% of the global number of maternal deaths (284 000). Sub-Saharan Africa alone accounts for 56% of the global burden. Maternal deaths are clustered around labour, delivery and immediate post-delivery periods. Critical contributory factors in LMICs, including Nigeria, are delays in receiving obstetric care (Ugwu & de Kok, 2015). Progress in reducing maternal mortality in Sub Saharan Africa (SSA) has been slow where more than 300,000 women still die each year during pregnancy and childbirth; most of them die because they lack access to skilled delivery attendance and emergency care (Gebrehiwot, Goicolea, Edin, & San Sebastian, 2012). Women in eastern Uganda were reported to have a high risk of death due to obstetric complications as compared with the central and western regions (Bomela, 2015).

Significant changes in health policy, health service delivery, specific protocols, guidelines and recommendations for the management of common causes of maternal death have been developed in South Africa (Bomela, 2015). However, there are five major causes of maternal deaths as a result of obstetric complications such as obstetric haemorrhage at 14%, the complication of hypertension at 14%, Medical and surgical disorders at 8.8%, pregnancy-related sepsis or infection at 5%, and 50% non-pregnancy related infection mainly AIDS in South Africa (Moodley, Pattinson, Fawcus, Schoon, Moran, & Shweni, 2014).

Primary prevention is also possible for some of these complications, including specific causes of haemorrhage, infection, and complications of obstructed labour (Hoque, 2011). In the case of complications that cannot be prevented, the goal is to manage appropriately to prevent them from becoming severe or life-threatening. A significant

proportion of serious complications in pregnancy occur in women with no recognisable risk factors and a severe complication may progress rapidly to a life-threatening situation (Cowgill, Bishop, Norgaard, Rubens, & Gravett, 2015; Soma-Pillay, P. and Pattinson, R.C., 2016). No study has specifically examined the burden of complications during labour and delivery in Mokopane Hospital of Limpopo Province in South Africa. Therefore, it was found important to determine the burden of obstetric and foetal complications during labour and delivery.

## **2. PROBLEM STATEMENT**

A pregnancy that has gone smoothly can still have problems when it is time to deliver the baby. Maternal death has decreased worldwide and attention is placed on delivery-related complications and approximately 9.5 million women around the world suffer from pregnancy-related complications and over 300,000 die (Sikder et al., 2011). The labour and birth process is usually straightforward, but sometimes complications arise that may need immediate attention. Pregnancy may be labelled as high risk from the onset of labour (Alfirevic, Stampalija, & Dowswell, 2017) and special attention is given to the women and others are labelled high risk due to the pre-existing medical condition.

Mokopane is a referral hospital to all district hospitals in Waterberg, many complications are experienced. Such complications are amongst others preeclampsia, poor progress of labour, severe perineal tear or third-degree tear, cord prolapse, shoulder dystocia, postpartum haemorrhage, foetal distress, perinatal asphyxia and meconium aspiration. Due to the identified delivery-related problems received in the hospital, the researcher decided to conduct a study in this hospital hence, there has not been an investigation into the burden of delivery complications and therefore this study aims to investigate the burden of labour and delivery complication experienced by women giving birth at Mokopane hospital.

## **3. PRELIMINARY LITERATURE REVIEW**

The purpose of reviewing the literature is to identify the key issues, problems and to educate oneself in the topic area and understand the background and justification of the undertaken research (Arshed & Danson, 2015). This means identifying gaps in existing knowledge, practice and articulating the weakness of the arguments of a

particular approach of previous studies. This study reviewed the literature on the burden of labour and delivery-related complications among pregnant women from international, continental, national and as well as local literature. The topics reviewed in the study are discussed in detail in Chapter 2.

## **4. AIM AND OBJECTIVES OF THE STUDY**

### **4.1 Aim of the study**

The study aimed to determine the burden of complications related to labour and delivery to pregnant women at Mokopane Hospital, Limpopo Province.

### **4.2 Objectives of the study**

The study pursued the following objectives:

- To profile the pregnant women attending maternity services at Mokopane Hospital, Limpopo Province;
- To categorise the complications experienced by pregnant women attending maternity services at Mokopane Hospital, Limpopo Province; and
- To determine the association between socio-demographics and complications experienced by pregnant women attending maternity services at Mokopane Hospital, Limpopo Province.

### **4.3 Research Question**

- What are the complications experienced by pregnant women attending maternity services at Mokopane Hospital, Limpopo Province?

## **5. OVERVIEW OF RESEARCH METHODOLOGY**

In this research study, the methodology includes research approach, research design, population and sampling, data collection methods, and data analysis which will be discussed in detail under the chapter of research methodology. Almalki (2016) describes research methodology as the procedures by which researchers go about their work of describing, explaining and predicting phenomena as well as

the standards that are utilised for the interpretation of information and the drawing of conclusions.

## **6. SIGNIFICANCE OF THE STUDY**

This study generated data and comprehensive information on the burden of labour and delivery complication experienced by women giving birth at Mokopane hospital and pregnant women in general. Moreover, the study helped in identifying the problem associated with labour and delivery complications and lay the foundation for further studies, planning and interventions that are aimed at improving the quality of life of the women in labour and their unborn babies. Therefore, the findings of this study provide information to manage women at higher risk of developing complications and understanding the complications in pregnancy.

## **7. OUTLINE OF CHAPTERS**

Chapter 1 Briefly discusses the overview of the study, research problem, the aim, objectives and the significance of the study.

Chapter 2 Covers the literature review in the context of the research undertaken.

Chapter 3 Describes the research methodology and study design used.

Chapter 4 Discusses the findings concerning literature control.

Chapter 5 Provides a summary of the results, limitations, recommendations and conclusion in the context of the aims and objectives of the study.

## **8. SUMMARY OF THE CHAPTER**

This study aimed to determine the burden of complications related to labour and delivery upon pregnant women at Mokopane Hospital, Limpopo Province. To make a sound of this study topic, the research questions rightly crafted for the study were answered. This chapter went further by outlining all chapters in the study. All ethical considerations were highlighted and sought. In the next chapter literature review is discussed in detail.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2. INTRODUCTION**

Whereas the previous chapter dealt with the whole structure of this study, this chapter focuses on the literature review. The literature was reviewed in line with the objectives of the study. This will be systematically reviewed starting at the International, continental as well as national and local levels. This chapter illuminates obtainable and current literature on the burden of complications related to labour and delivery upon pregnant women. In line with the study objectives, the study literature focuses on Pre-eclampsia and delivery-related complications. Moreover, the public health intervention to reduce and prevent labour and delivery-related complications is paramount to the study.

#### **2.1 THE GLOBAL BURDEN OF OBSTETRIC COMPLICATIONS**

Around the world every day about 800 women die from pregnancy or childbirth-related complications (Singh, et al 2017). WHO estimates that annually approximately 287,000 women die of preventable complications related to pregnancy and childbirth (August, Pembe, Mpembeni, Axemo, & Darj, 2015; Singh, et al 2017); the majority of these (99%) occur in developing countries and, out of those, 51% occur in the Sub-Saharan region (August, Pembe, Mpembeni, Axemo, & Darj, 2015). Despite the global decrease in maternal mortality ratio from 1990 to 2010, the majority of the deaths are in sub-Saharan Africa.

In Europe, intrauterine premature closure of the ductus arteriosus, pulmonary hypertension, non-closure of the ductus arteriosus in the postnatal period, intracranial bleeding and gastrointestinal bleeding or perforation were found to be contributing to Preterm delivery (PTD) at a rate between 5–18%, with only 0.3–0.5% occurring before 28 weeks (Di Renzo, Cabero Roura, Facchinetti, Helmer et al., 2017). In Switzerland, two national studies have shown that immigrant women are at higher risk of obstetric complications than native women, with higher rates of caesarean section, low birth weight, and infant and maternal mortality (Ratcliff, Sharapova, Suardi, & Borel, 2015).



Perinatal depression, which includes major and minor depressive episodes that occur during pregnancy or in the first 12 months after delivery, is one of the most common medical complications during pregnancy and the postpartum period, affecting one in seven women (Committee on Obstetric Practice, 2015). The Asia-Pacific is estimated to be having 76 million women ranging in age from 20 to 39 years who have diabetes/pre-diabetes and these women are therefore at risk of having a pregnancy complicated by diabetes (Tutino, Tam, Yang, Chan, Lao, & Ma, 2014).

## **2.2 The African perspective of obstetric complications**

Even when African women have easy access to a maternity ward and essential obstetric care, many develop life-threatening complications of pregnancy, and the fatality rate associated with some complications can be quite high. In a study conducted in cities and towns in six countries, 3-9 women of every 100 giving birth developed a severe complication that was directly related to the pregnancy (World Health Organization, 2018). Roughly one-third of those with sepsis or uterine rupture, and about one-fifth of those with eclampsia, died.

A Nigerian woman is 500 times more likely to die in childbirth than her European counterpart (Ramatu & Yohanna, 2017). In Kenya, over 50% of deliveries are attended to by unskilled persons and/ or outside a health facility, exposing mothers and babies to poor health outcomes should a complication arise during delivery or postnatal period (Echoka, Makokha, Dubourg, Kombe, Nyandieka, & Byskov, 2014). Poor women in remote areas are the least likely to receive adequate health care. This is especially true for the region with low numbers of skilled health workers, such as sub-Saharan Africa and South Asia (WHO 2018).

## **2.3 The obstetric complications in South Africa**

The most common causes of maternal death in South Africa are non-pregnancy-related infections, especially AIDS. Complications of hypertension in pregnancy, obstetric haemorrhage including antepartum and postpartum and pregnancy-related infection especially septic abortions and puerperal sepsis also play a vital role in maternal death in South Africa (Saving Mothers Report 2013).

The high number of cases that were thought to be possibly or probably avoidable in the *Saving Mothers* reports would indicate that we also lack the skills to manage complications. Complications of HIV infection as reflected in maternal deaths due to non-pregnancy-related infections are the most common underlying cause of maternal death in South Africa (Pattinson, Makin, Pillay, van den Broek, & Moodley, 2015). In South Africa mothers were often healthy; 53%, 38% and 45% in the antepartum, intrapartum and neonatal death groups, respectively. Where there was a maternal condition, it was most often maternal medical conditions, and complications of placenta, cord and membranes (Allanson, Tunçalp, Gardosi, Pattinson, Francis et al., 2016).

An assessment of maternal and perinatal deaths in South Africa owing to complications of hypertension involve two major factors which are the failure to refer women with hypertension, mostly from the primary healthcare clinics, and infrequent antenatal visits (Moodley, Fawcus, & Pattinson, 2018). Maternal and perinatal death audits or reviews in South Africa show that in many cases healthcare providers failed to recognise and manage complications in a timely and effective manner, and this is one of the contributors to poor-quality or substandard care. Therefore, it was found that building the capacity of healthcare providers to ensure they have the necessary skills, knowledge and competence to manage obstetric and newborn complications through 'in-service' or 'on-the-job' training has become a common approach (Ameh, & van den Broek, 2015).

## **2.4 Types of labour and delivery-related complications**

The researcher argues that each pregnancy and delivery is different. Therefore, different types of complications may arise.

### **2.4.1 Pre-eclampsia**

Preeclampsia is a pregnancy complication characterized by high blood pressure and signs of damage to another organ system, most often the liver and kidneys (World Health Organisation, 2010). As outlined by Peres, Mariana and Cairrao (2018) stipulate that preeclampsia usually begins after 20 weeks of pregnancy in women whose blood pressure had been normal. The researcher argues that if this kind of

complication is left untreated, preeclampsia can lead to serious — even fatal — complications for both the pregnant woman and the baby.

Peres, Mariana and Cairrao (2018) indicated that pre-eclampsia is a hypertensive disorder of pregnancy, considered a major cause of maternal and perinatal morbidity and mortality. These diseases affect between 3% and 5% of all pregnancies and account for more than 60,000 maternal and 500,000 foetal deaths per year worldwide (World Health Organisation, 2010). Therefore, if you're diagnosed with preeclampsia too early in your pregnancy to deliver your baby, you and your doctor face a challenging task (Crafter, 2017). Your baby needs more time to mature, but you need to avoid putting yourself or your baby at risk of serious complications.

#### **2.4.2 Injuries to the genital tract**

Injuries to the genital tract during labour can be prevented most time by ensuring good obstetrical management. Injuries that can develop during childbirth are mainly the perineal tears which are categorised according to the degree, first-degree tear, second-degree tear and third-degree tear (Loewenberg-Weisband, Grisaru-Granovsky, Ioscovich, Samueloff, & Calderon-Margalit, 2014). Factors that most contribute to perineal tear are large foetus, persistent occiput posterior position, breech extraction and face presentation (Ezebialu, Okafo, Oringanje, Ogbonna, Udoh et al., 2017).

Injuries to the cervix are another injury that can occur to the genital tract, which is small cervical tears most common in primigravidas (Kathpalia, Vasudev, Sinha, & Sandhu, 2016). Large cervical tears are usually caused by the delivery of a baby with the use of forceps when the mother is pushing before fully dilatation and precipitation of labour. Severe bleeding that starts immediately after birth despite a well-contracted uterus is a sign that careful cervical examination should be done and only larger cervical tear or tear that is bleeding need to be sutured (Crafter, 2017). Injury to the uterus is another injury that can occur to the genital tract and is a severe obstetrical injury (Jain, Chari, Maslovitz, Farine, Bujold et al., 2015). It can be classified as a spontaneous rupture (intact uterus or uterus with the previous scar) and traumatic uterine rupture (obstetric intervention, blunt trauma and penetrating abdominal wound).

### **2.4.3 Vesico-Vaginal fistula and recto fistula**

A vesicovaginal fistula is an abnormal opening that forms between the bladder and the wall of the vagina (Zaid, Bayne, Harris, Alwaal, McAninch, & Breyer, 2015). On the flip side of the coin, a rectovaginal fistula is an abnormal connection between the lower portion of a pregnant woman intestine, rectum and vagina (Van Heukelum & Blake, 2017). As found by the World Health Organization, (2015) stipulates that Vesicovaginal fistulas are often a complication after surgery to treat problems in the bladder or vagina. A vesicovaginal fistula is an opening that develops between the bladder and the wall of the vagina. The result is that urine leaks out of the vagina, sometimes lightly but it can be steady if the fistula is large (World Health Organization, 2015). In addition to being a serious medical problem, this condition is very upsetting. The leakage is embarrassing and can smell bad.

They also can be linked to gynaecological cancer, either from the disease or sometimes as a side effect of radiation therapy or surgery to treat cancer. Particularly bad or repeat urinary tract infections can sometimes lead to fistulas too, but this is rare. A fistula can be a complication after vaginal or bladder surgery. The only way to repair this opening is through surgery, which is very often successful. This urine retention is a very common problem after labour, especially long and difficult delivery. It is developing as a result of overdistension of the bladder as well as associated with injuries to the urethra and neck of the bladder. Pubic symphysis diastasis during vaginal delivery is a rare and frequently undiagnosed complication (Van Heukelum & Blake, 2017).

### **2.4.4 Poor progress of labour**

Poor progress in labour is associated with increased maternal morbidity and mortality. Prolonged labour can predispose to maternal dehydration, sepsis, and ketoacidosis and increase the risk of PPH, obstetric fistulae, obstruction, uterine rupture, stillbirth, and maternal death (Desai, Chauhan, & Chaudhary 2013). There is also an increase in Caesarean section rates for dystocia and failure to progress, with its attendant risks for both the mother and the baby. Systematic evidence-based management of poor progress in labour can prevent adverse obstetric outcomes.

Labour progresses differ from one woman to the other and it also depends on the number of pregnancies and the severity of contractions. The slow progress of labour (SPL) occurs in 3-37% of all labours. It constitutes the main cause of primary caesarean section (CS) and is associated with operative births, maternal and foetal morbidity, and negative birthing experience. SPL is also the principal reason for the transfers of women from midwife-led units (MLUs) or their homes, to hospitals (Iannuzzi, 2016).

#### **2.4.5 Umbilical cord prolapse/presentation**

Umbilical cord prolapse is where the umbilical cord descends through the cervix, with (or before) the presenting part of the fetus. It affects 0.1 – 0.6% of births (Lovereen, et al., 2018). Cord prolapse occurs in the presence of ruptured membranes and is either occult or overt: Occult (incomplete) cord prolapse – the umbilical cord descends alongside the presenting part, but not beyond it. Overt (complete) cord prolapses – the umbilical cord descends past the presenting part and is lower than the presenting part in the pelvis. With cord presentation or prolapse, blood flow through the umbilical vessels may be compromised from compression of the cord between the fetus and the uterus, cervix or pelvic inlet (Edwards, 2017). The best method of delivery is a caesarean section if the baby is still viable especially in the first and early second stages of labour (Bomela, 2015). Cord presentation – the presence of the umbilical cord between the presenting part and the cervix. This can occur with or without intact membranes. Although the incidence is relatively low, the mortality rate for such babies is high (~91 per 1000). This is large because cord prolapse occurs more frequently in preterm babies, who are often breech, and who may also have other congenital defects.

#### **2.4.6 The abnormal heart rate of the baby/ fetal distress**

Fetal distress is the abnormal fetal variability (Desai, Chauhan, & Chaudhary 2013) and these abnormalities may be associated with maternal stress or anxiety during labour and fetal hypoxia as a result of drugs administered to the maternal including the opioids (Todd, Rucklidge & Kay 2013). Fetal distress, also called “nonreassuring fetal status,” is the term medical professionals use to describe when a fetus is not receiving adequate oxygen during pregnancy or labour (Desai, Chauhan, & Chaudhary 2013).

Fetal distress is an indication that the baby may not be doing well in utero. When a baby is in distress they may require immediate intervention, such as delivery by C-section or certain methods of intrauterine resuscitation. If fetal distress goes unmanaged it can lead to more severe injuries such as hypoxic-ischemic encephalopathy (HIE). Fetal distress is diagnosed based on fetal heart rate monitoring. The fetal heart rate should be monitored throughout pregnancy and taken at every prenatal appointment. Doctors can use internal or external tools to measure the fetal heart rate (Desai, Chauhan, & Chaudhary 2013). It is most commonly measured via an electronic fetal monitor. The World Health Organization (2015) argues that the fetal heart rate should be between 110 and 160 beats per minute during the third trimester of pregnancy and labour.

#### **2.4.7 Premature rupture of membranes (PROM)**

Premature rupture of the membrane is defined as rupture of the membrane before the onset of labour and beyond the viable age (Lovereen, Khanum, Nargis, Begum, & Afroze, 2018). Premature rupture of membrane (PROM) is the leading cause of preterm births and perinatal morbidities and complications such as prematurity accompanied by respiratory distress syndrome, intraventricular haemorrhage, necrotising enterocolitis are noted (Lovereen, et al., 2018). Premature rupture of membranes (PROM) is a rupture (breaking open) of the membranes (amniotic sac) before labour begins. If PROM occurs before 37 weeks of pregnancy, it is called preterm premature rupture of membranes (PPROM). PROM occurs in about 8 to 10 per cent of all pregnancies. PPRM (before 37 weeks) accounts for one fourth to one-third of all preterm births.

#### **2.4.8 Shoulder dystocia and Postpartum haemorrhage (PPH)**

Shoulder dystocia is often an unexpected complication that requires immediate action if severe morbidity or even death of the fetus, is to be avoided. It is diagnosed when the fetal head is already delivered but the shoulder cannot be delivered by means of the ordinary methods (Bomela, 2015). Postpartum haemorrhage remains a major cause of maternal morbidity and mortality (Edwards, 2017). PPH is a potentially life-threatening complication from vaginal and caesarean section birth. PPH is one of the most common obstetrical complications, affecting up to 18% of deliveries. It accounts

for 35-55% of peripartum maternal deaths worldwide (Buzaglo, Harlev, Sergienko & Sheiner, 2014).

## **2.5 SUMMARY OF THIS CHAPTER**

This chapter extensively reviewed historical and recent literature on the burden of labour and delivery-related complications among pregnant women at Mokopane Hospital of Limpopo Province. Types of labour and delivery-related complications were also explored. In this chapter, the literature reviewed in line with the objectives of the study. This was done systematically starting at the International, continental as well as national levels. This chapter illuminates obtainable and current literature on the burden of labour and delivery-related complications among pregnant women. The following chapter is the research methodology.

## **CHAPTER 3**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

The information obtained from the literature study in the previous chapter has shed some light on the burden of labour and delivery-related complications among pregnant women. In this chapter, the researcher elaborates on the methodology employed in this study to contribute to the burden of labour and delivery-related complications among pregnant women. This chapter provides a description of the research process. It presents information about the method that was used in undertaking this research as well as presenting justification for using this method. This chapter also presents the different stages of the research which include the selection of participants which are the clinical records, data collection and data analysis. An emphasis is placed on the following: research approach and research design, population and sampling procedures, quality criteria, the significance of the study, ethical considerations and limitations of the study.

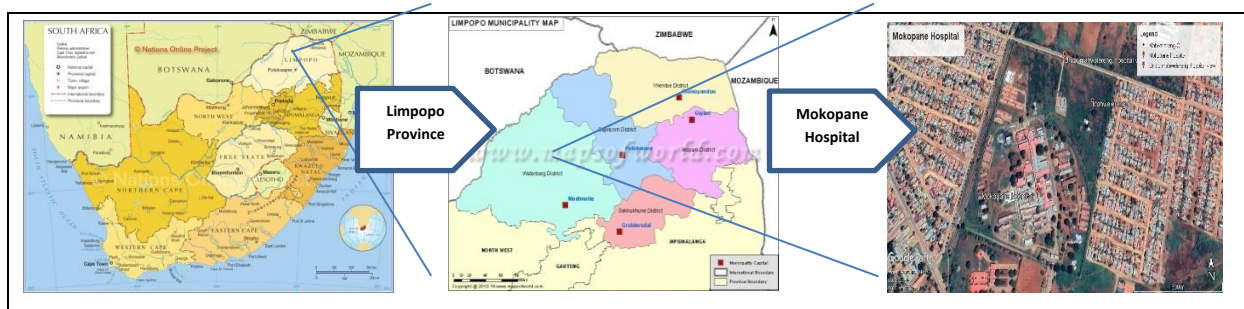
#### **3.2 Research Designs**

Research design is used for conducting the study that maximises control over factors that could interfere with the validity of the findings (Leavy, 2017). It is a plan that guides the arrangement of the condition for the collection and analysis of data. (Terre Blanche, Durkheim & Painter 2014). This study will be quantitative in nature and will use a descriptive study design which will be cross-sectional and retrospective in nature. A cross-sectional study is an observational research type that analyses data of variables collected at one given point of time across a sample population. Retrospective study subject is generally measured once; the intention is to establish associations between variables (Leavy, 2017). The patient's data that was used was from January 2017 to December 2019. In a cross-sectional study used in this study, the researcher measured the outcome and the exposures in the study participants at the same time.



### 3.3 Study setting

Study setting refers to the place and condition or circumstances where and within which the research study takes place (Pilot & Beck, 2012). The current study was conducted at Mokopane Hospital, which is a public hospital operated by the Limpopo Department of health. This hospital is situated at Dudu-Madisha drive in Mahwelereng zone-A in Mogalakwena Municipality of Waterberg district. Waterberg is one of the 5 districts of Limpopo province of South Africa and it has 5 municipalities which are Thabazimbi; Lephalale; Modimolle-Mookgophong; Bela-Bela and Mogalakwena. Mogalakwena Local Municipality. The Mogalakwena municipality covers a total area of approximately 6,166 km<sup>2</sup> (2,381 sq mi) with a total population of approximately 307,682. At Mokopane hospital, the current study was conducted at maternity unit which has total bed occupancy of 46 and the service rendered is ANC, labour and delivery, normal post-natal, C/section post-natal, Neonatal and Kangaroo mother care.



*Figure 1 Maps of South Africa and the Limpopo Province showing the Mokopane Hospital in the Mogalakwena Municipality located in the Waterberg District.*

### 3.4 Population

The population of interest is the study's target population that it intends to study (Bertram & Christiansen 2014; Majid, 2018). In the current study, the target population was maternity case records of women delivered at Mokopane hospital in the previous three years which is from January 2017 to December 2019. Study population refer to the population as an aggregate or totality of all the objective, or members that conform to a set of specification (Polit & Hungler, 1999). The population in this study include all clinical records of pregnant women who delivered in Mokopane Hospital from January 2017 to December 2019.

### 3.5 Sampling methods

Sampling is the process of selecting the subset or portion of the population to represent the identified population. (Clark, & Creswell, 2014). In this study, simple random sampling was utilised to select the sample, where all delivery files of mothers delivered at maternity between January 2017 to December 2019 Mokopane regional hospital form part of the study. The Yamane's population proportion approach (Louangrath, 2014) was adopted in which 5% sampling error provision and the sample size was calculated based on the following formula below:

$$n = \frac{N}{1 \pm N(e)^2} =$$

n is the sample size

N (total population) of women who delivered at Mokopane Hospital during the period of the study = 10080

e sampling error (5%)

$$n = \frac{10080}{(1+(10080 \times 0.05 \times 0.05))} \dots = 384, 73$$

Therefore, the current study aims to reach 385 maternity case records. In the current study, each patient delivery file was chosen entirely by chance and each file in maternity ward had an equal chance, or probability, of being selected. The simple random sampling was achieved by giving each patient delivery file in maternity ward a number, and then a table of random numbers was used to decide which individuals will be included.

### **3.6 Inclusion/exclusion**

- Inclusion

All delivery files of mothers delivered at maternity between January 2017 to December 2019 Mokopane hospital.

- Exclusion

All delivery files of mothers delivered from January 2017 to December 2019 with incomplete information were excluded from this study.

### **3.7 Data Collection**

Data collection refers to the gathering of information needed to address a research problem (Pilot & Beck 2004). The data collection tool in this study was a questionnaire which was developed by using literature guiding the study focus. The questionnaire was completed using the clinical files obtained from the hospital of mothers delivered from January 2017 to December 2019. The information includes age, parity, gravidity, gestational age, mode of delivery, any delivery complication, foetal condition after delivery including the first five minutes APGAR score and birth weight. A total number of 389 was administered for this purpose.

### **3.8 Data Analysis**

Refer to the systematic organisation and synthesis of research data and the testing of a research hypothesis using those data (Polit & Beck 2004). All data collected were analysed using statistical software SPSS version 26 and Microsoft excel. The information was presented in descriptive statistics for all variables to determine the distribution of variables. Tables were used to illustrate the results. Categorical variables (e.g., age, parity, gravidity and gestational age) was analysed by chi-square or Mann Whitney test for continuous variables. The relationship between variables was analysed by Pearson's correlation.

### **3.9 Reliability and Validity**

Reliability is the likelihood of obtaining the same results when the researcher measures the same variable more than once, or when more than one person measures the same

variables (Brink 2000). In this study, a Pre-test or pilot-test was done to ensure the reliability of the study and ensure that the same results will be obtained if the study is conducted again using the same tool. The pilot study was done at Voortrekker Hospital, where at least ten maternity case records were used for pre-testing.

Validity refers to an expression of the degree to which a test is capable of measuring what is intended to measure (Bonita, Beaglehole & Kjellstrom, 2017). In the current study, validity was ensured by using the methods which are of high quality and this was targeted to measure the burden of labour and delivery related complications among pregnant women. These methods were thoroughly researched and based on existing knowledge. Therefore, a standardized questionnaire was based on established theory or findings of previous studies, and the questions were carefully and precisely worded to ensure reliability and validity. Internal validity is the degree to which the results of observation are correct for the particular group of people being studied (Brink 2000). The researcher used the correct design for the study to minimise the systemic error that threatens the internal validity. External validity is the extent to which the results of a study apply to people not in it (Brink 2000). In this study, all maternity case record was collected from the filling room using file number from maternity admission book/maternity register at Mokopane hospital for the study period.

### **3.10 Bias**

Bias is any influence that produces misrepresentation of an outcome of a particular study finding (Botma et al. 2010). The research ensured that she reports what is in the maternity case record without adding or omitting any information to suit the study. The researcher brackets any information known by the researcher. The following type of bias was ensured to minimize bias:

- Sampling bias

Simple random was utilised to ensuring that all the maternity case record in Mokopane Hospital for a period of study was selected to have a chance of being included in the sample to minimise bias.

- Selection bias

To avoid selection bias, the researcher adhered to the inclusion criteria where all delivery files of mothers delivered at maternity between January 2017 to December 2019 Mokopane hospital was selected.

- Observational bias

This was avoided by were the researcher record and report what is in the clinical record without omitting or adding additional information known by the researcher.

### **3.11 ETHICAL CONSIDERATIONS**

As stipulated by De Vos et al., (2011:56) “research should be guided by acceptance, promises, mutual trust, cooperation and well-accepted prospects between all parties involved”. Having done so the researcher shall have accordingly complied with the relevant ethical considerations. Ethics has to do with behaviour that is considered right or wrong. Ethics is an important consideration in research particularly that involves humans and animals. (Bertram & Christiansen 2014). No harm to humans, as the study was focusing only on the patient record. In the current study, the researcher will be guided by the following ethics:

#### **3.11.1 Permission to conduct the study**

Ethical concerns are considered an integral part of the planning and execution of research. This statement is supported by De Vos et al., (2011) who explains that ethical research is aimed at avoiding harm and producing gain not only in the wider field but also for the participants in the study.

- The researcher sought and received permission to conduct the study from the relevant authorities namely, Turfloop Research and Ethics Committee (see Appendix F), the faculty approval letter (see Appendix G) and the Department of Health (see Appendix H).

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### **3.12 CONFIDENTIALITY AND ANONYMITY**

The researcher handled the data obtained from patient files properly and confidentially to ensure the anonymity of the participants. The respondents, therefore, were not connected to the study while the research is done (De Vos et al., 2011). Anonymity was ensured by not putting the real names or file numbers and other identification was

assigned to the files. The researcher ensured that all collected data was kept safe and secured, only the people involved in the study have access to the clinical records. The finding of the study was only given to the relevant authorities to ensure privacy. The researcher also protected the identities of the data collected and make sure that their right to privacy is respected (De Vos et al., 2011).

### **3.13 AVOIDANCE OF HARM**

The fundamental ethical rule of social research is that it must bring no harm to participants (Babbie, 2007). In the current study, no harm was experienced as the study was using secondary data from the clinical records.

### **3.14 SIGNIFICANCE OF THE STUDY**

This study generated data and comprehensive information on the burden of labour and delivery complication experienced by women giving birth at Mokopane hospital and pregnant women in general. Moreover, the study helped in identifying the problem associated with labour and delivery complications and lay the foundation for further studies, planning and interventions that are aimed at improving the quality of life of the women in labour and their unborn babies. Therefore, the findings of this study provide information to manage women at higher risk of developing complications and understanding the complications in pregnancy.

### **3.15 SUMMARY OF THE CHAPTER**

In this chapter, the researcher elaborated on the methodology employed in this study to contribute to the burden of labour and delivery-related complications among pregnant women. This chapter described the research process. It presented information about the method that was used in undertaking this research as well as presenting justification for using this method. The next chapter will focus on data presentation, analysis and interpretation of findings.

**CHAPTER 4**  
**DATA PRESENTATION, ANALYSIS AND INTERPRETATION OF**  
**FINDINGS/RESULTS**

**4.1 INTRODUCTION**

In this chapter, the researcher discusses data interpretation. A detailed presentation and description of the results is: a finding of the research was discussed. The research finding was interpreted and sense was made out of the numerical description of phenomena.

**4.2 QUANTITATIVE DATA PRESENTATION**

Quantitative data was collected using a retrospective dataset obtained from clinical files of patients admitted to the maternity ward in Mokopane hospital from January 2017 to December 2019. A total number of 389 files of pregnant women were obtained and analysed at Mokopane hospital. Below is their information.

**4.2.1 Demographic information**

**4.2.1.2 Gender distribution of the respondents**

Table 1: Gender of the respondents

		Percentage
Female	389	100%

Table 1 shows that the sample was files of pregnant women with 100% (n=389) of the respondents representing women. All the files obtained were from pregnant women between January 2017 to December 2019.

### 4.3 RESULTS

#### 4.3.1 Age Results

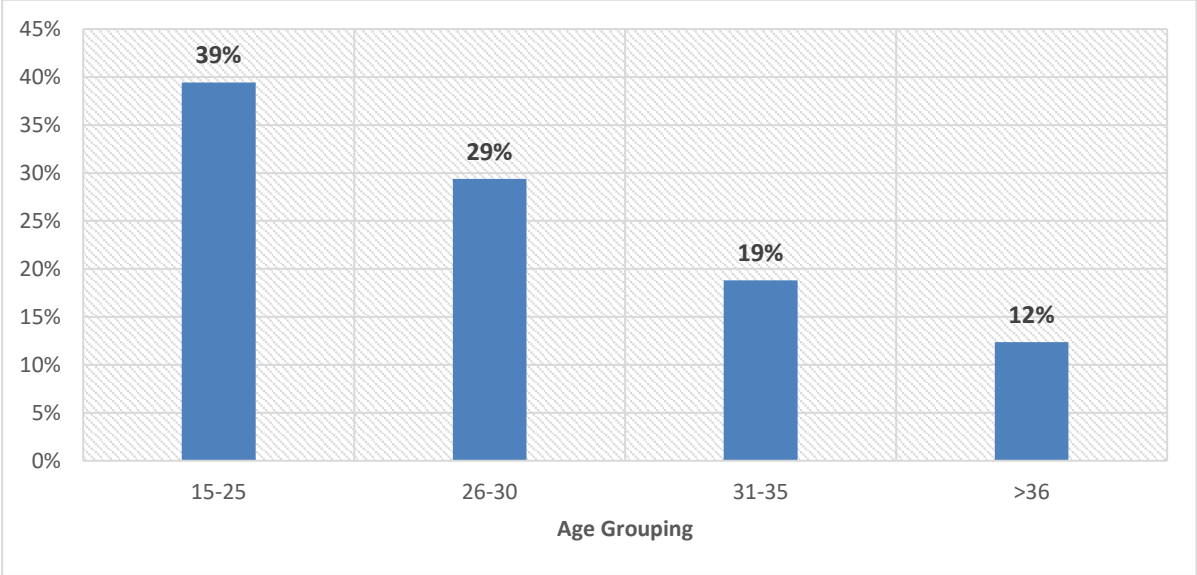


Figure 1: Age grouping of the participants

The above figure shows the age grouping of the participants which is from 15 to 36 years of age or greater than 36 years of age as displayed by the chart above. The researcher analysed a total number of 389 files of pregnant women which were obtained at Mokopane hospital.

#### 4.3.2 Self-referral and Admission from home



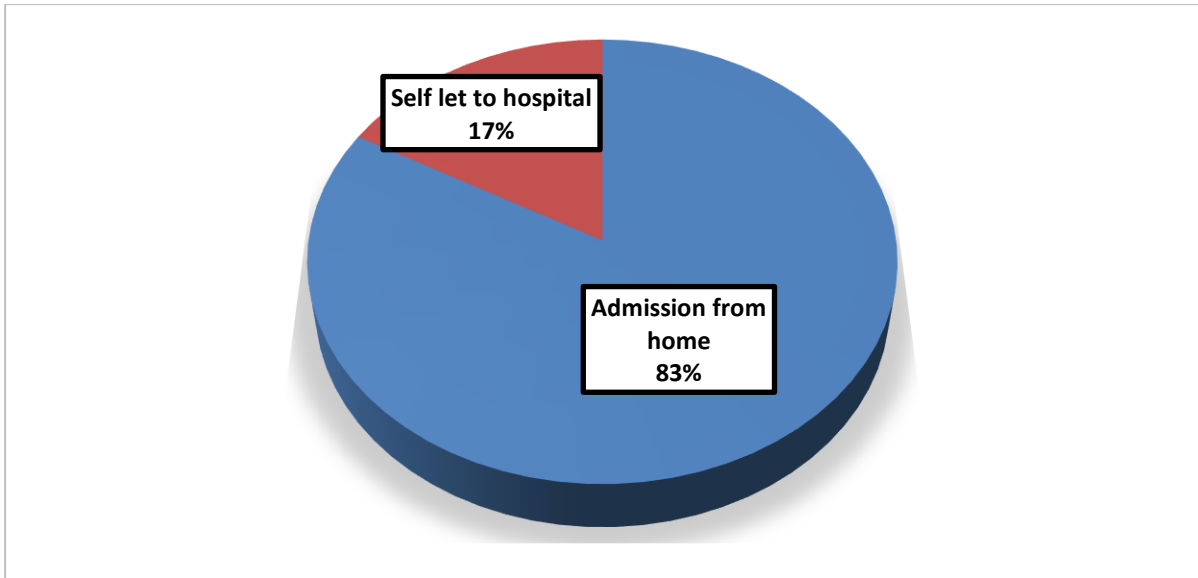


Figure 2: A retrospective data from Mokopane Hospital

In terms of admission from home, the majority of the patients surveyed were admitted from home (83% admission from home vs 17% self-let to hospital). The above figure 2 shows a retrospective dataset obtained from clinical files of patients admitted to the maternity ward in Mokopane hospital from January 2017 to December 2019. The study involved 389 pregnant women at Mokopane hospital. Of the 389 patients, the majority were aged between 15-25 years (39%) followed by 26-30 years (29%), and lastly, greater between 31-35 years (19%).

#### 4.3.4 Gravity

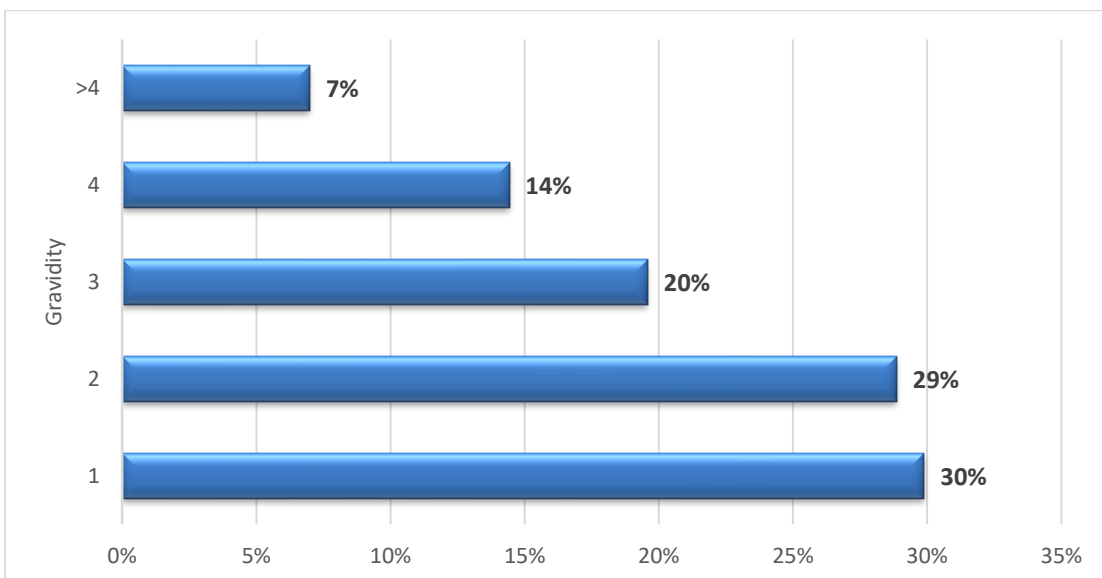


Figure 3: Gravidity

In the context of this study, the researcher defines gravidity as the number of times that a woman has been pregnant. The study finds that in terms of gravidity (No. of pregnancy), most pregnant women had one and two pregnancies before (30% and 29% respectively). The study finds that the majority of women who suffers from complications were once pregnant in their lifetime. This finding is supported by Akter et al, (2013) found that pregnant women are most like to experience complications even though they were once pregnant in their lifetime.

#### 4.3.5 Parity Results

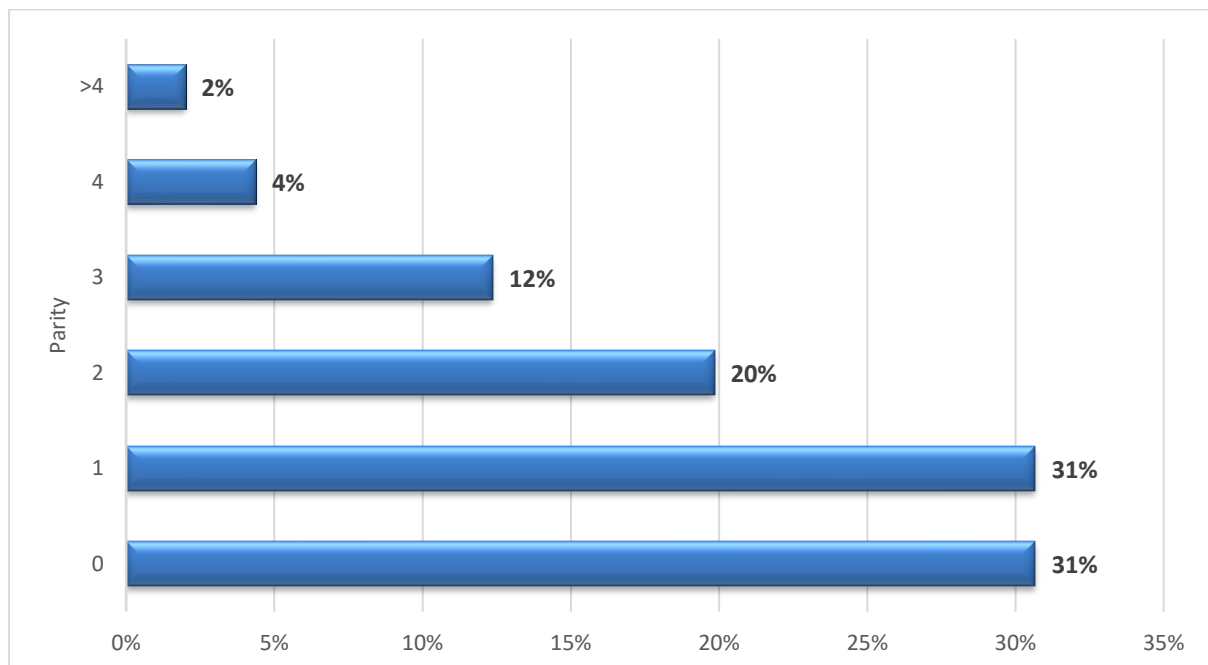


Figure 4: Parity

Parity is defined as the number of times that she has given birth to a fetus with a gestational age of 24 weeks or more, regardless of whether the child was born alive or was stillborn (Akter, Jesmin, Rahman, Islam, Khatun, Yamaguchi, Akashi, H & Mizutani, 2013). The study finds that in terms of parity (No of children alive), 31% of the women had one and no children alive.

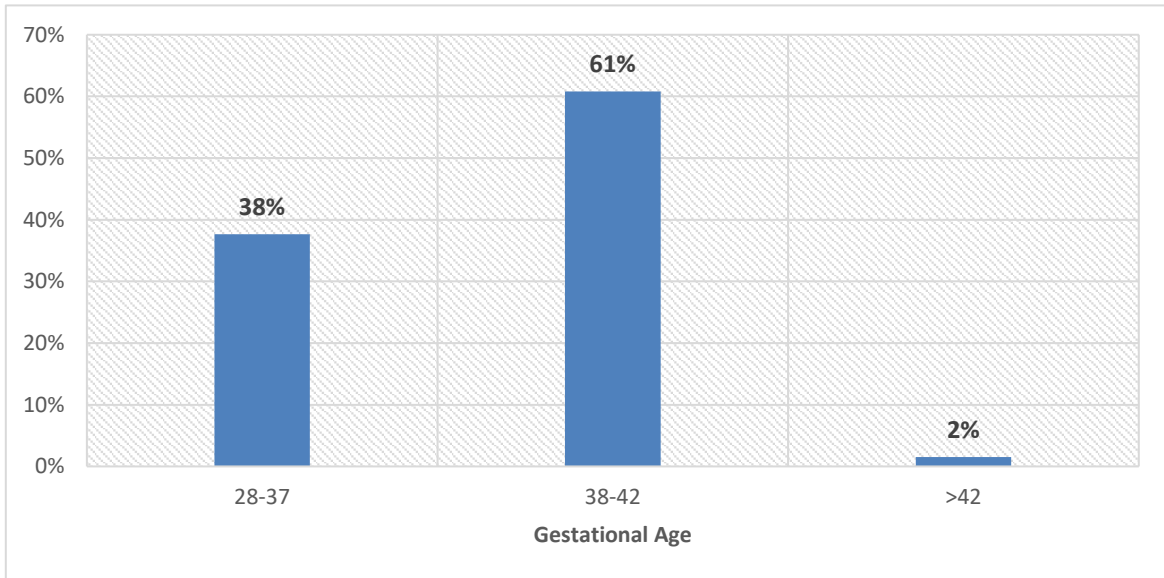


Figure 5: Gestational Age

All pregnant women surveyed in Mokopane hospital majority were found to be on 38-42 weeks (38-42) age of the pregnancy followed by 28-37 weeks (38%).

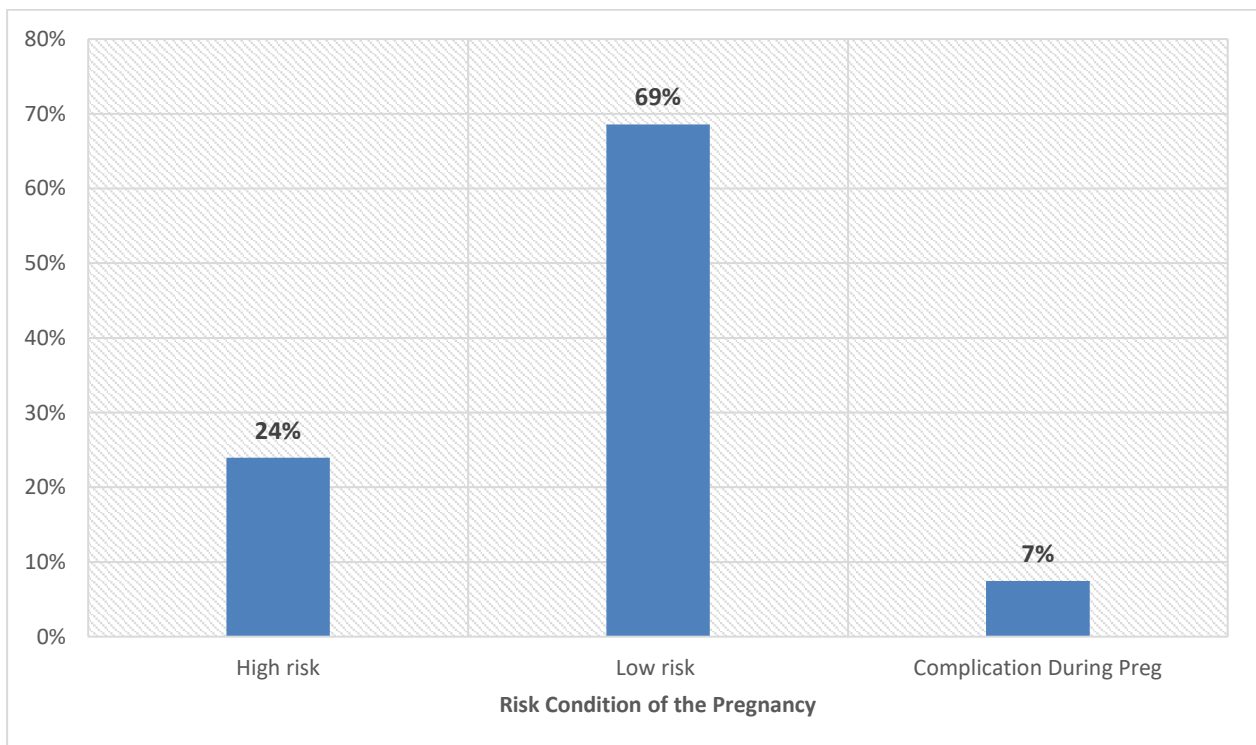


Figure 6: Risk condition of the pregnancy

The above figure shows the risk condition of the pregnancy of women in Mokopane Hospital during the time the study was conducted. The study found that out of the 389

pregnant women, the majority were at low risk of pregnancy (69%) followed by a high risk of pregnancy (24%).

Table 2: Maternal outcomes

<b>Maternal outcome</b>	<b>Frequency</b>	<b>Percentage</b>
Mode of delivery		
Normal virginal delivery	286	73.7
Assistant instrumental delivery	2	0.5
Caesarean section	100	25.8
Condition of mother after delivery		
Normal	334	86.1
Sick/complication	54	13.9
Death	0	0
Duration of stay after delivery		
12-24 hours	191	49.2
3-7 days	178	45.9
>7 days	19	4.9

Table 2 indicates the clinical files of pregnant women admitted to the Mokopane hospital from January 2017 to December 2019. Out of the 389 captured data, 286 (73.7%) were delivered through normal virginal as 100 (25.8%) were delivered through Caesarean section. About 86% of the mothers were normal after delivery whilst 14% were sick or had complications. Duration of stay after delivery, the majority had about 12-24 hours (49.2%) followed by 3-7 days (45.9%).

Table 3: Foetal outcome

<b>Foetal outcome</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Sex</b>		
Boy	203	52.6
Girl	184	47.4
<b>Weight (Kg)</b>		
<1.5	21	5.4
1.6-1.99	16	4.1
2-2.5	44	11.3
2.6-3.99	286	73.5
>4	21	5.4
<b>Duration of stay after delivery</b>		
<12 hours	20	5.2
12-24 hours	188	48.5
3-7 days	148	38.1
>7 days	32	8.2
<b>Condition of the new-born</b>		
Normal	329	84.8
Sick/complication	31	8.0
Death	28	7.2

Table 3 shows the clinical files of pregnant women admitted to the Mokopane hospital. Out of the 389 captured data, 203 (52.6%) gave birth to a baby boy. About 73% of the neonate weight was between 2.6 and 3.99 kg whilst 11% were between 2 and 2.5 kg followed by <1.5 kg and >5 kg. Duration of neonate stay after delivery, the majority stayed between 12-24 hours (48.5%) followed by 3-7 days (38.1%). Few 5.2% of neonates stayed for less than 12 hours after delivery in the hospital.

Table 4: Mode of delivery

Variables	Mode of delivery			P-value
	Normal	Assistant instrumental	Caesarean section	
Age				
15-25	114 (74.5%)	0 (0%)	39 (25.5%)	0.067
26-30	85(74.6%)	0 (0%)	29 (25.4%)	
31-35	56 (76.7%)	2 (2.7%)	15 (20.5%)	
>35	31 (64.6%)	0 (0%)	17 (35.4%)	
Admission from home				
Yes	249 (77.3%)	2 (0.6%)	71 (22.0%)	0.005
No	37 (56%)	0 (0%)	29 (44%)	
Gravidity				
1	86 (74.1%)	0 (0%)	30 (25.9%)	0.449
2	75 (67.0%)	1 (0.9%)	36 (32.1%)	
3	58 (76.3%)	0 (0%)	18 (23.7%)	
4	45 (80.4%)	1 (1.8%)	10 (17.9%)	
>4	22 (78.6%)	0 (0%)	6 (21.4%)	
Parity				
0	90 (75.6%)	0 (0%)	29 (24.4%)	0.225
1	79 (66.4%)	1 (0.8%)	39 (32.8%)	
2	56 (72.7%)	0 (0%)	21 (27.3%)	
3	41 (85.4%)	1 (2.1%)	6 (12.5%)	
4	13 (76.5%)	0 (0%)	4 (23.5%)	
5	5 (100%)	0 (0%)	0 (0%)	
Gestational age				
28-37	113 (77.4%)	1 (0.7%)	32 (21.9%)	0.670
38-42	168 (71.2%)	1 (0.4%)	67 (28.4%)	
>42	5 (83.3%)	0 (0%)	1 (16.7%)	
Risk condition of the pregnancy				
High risk	37 (39.8%)	1 (1.1%)	55 (59.1%)	<0.001
Low risk	236 (89.5%)	1 (0.4%)	29 (10.9%)	
Complications during pregnancy	13 (44.8%)	0 (0%)	16 (55.2%)	
Neonate stay in hospital				
0	19 (95.0%)	0 (0%)	1 (5.0%)	<0.001
12-24 hours	186 (98.9%)	1 (0.5%)	1 (0.5%)	
3-7 days	64 (43.2%)	0 (0%)	84 (56.8%)	
>7 days	17 (53.1%)	1 (3.1%)	14 (43.8%)	

Table 4 shows the clinical files of pregnant women admitted to the Mokopane hospital from January 2017 to December 2019. It can be seen that pregnant women who were

at high risk and had complications majority had delivered through caesarean section (59.1% caesarean section vs 39.8% normal; 55.2% caesarean section vs 44.8% normal respectively). As for neonates who stayed in the hospital between 3-7 days most of the women delivered through caesarean section (56.8% caesarean section vs 43.2% normal).

Women admitted from home had a significantly higher prevalence for caesarean section than those who let themselves to the hospital to give birth (P-value = 0.005). Pregnant women who were on high-risk conditions of the pregnancy had a significantly higher prevalence for caesarean section than other groups (P-value < 0.001). Pregnant women whose neonate stayed in the hospital for 3-7 days had a significantly higher prevalence for caesarean section than other groups (P-value < 0.001).

Table 5: Condition of mother after delivery

Variables	Condition of mother after delivery		P-value
	Normal	Sick/complication	
Age			0.401
15-25	130 (85%)	23 (15%)	
26-30	95 (83.3%)	19 (16.7%)	
31-35	67 (91.8%)	6 (8.2%)	
>35	42 (87.5%)	6 (12.5%)	
Admission from home			0.019
Yes	270 (83.9%)	52 (16.1%)	
No	64 (96.9%)	2 (3.1%)	
Gravidity			0.549
1	99 (85.3%)	17 (17%)	
2	95 (84.8%)	17 (15.2%)	
3	64 (84.2%)	12 (15.8%)	
4	48 (85.7%)	8 (14.3%)	
>4	28 (100%)	0 (0%)	
Parity			0.530
0	102 (85.7%)	17 (14.3%)	
1	102 (85.7%)	17 (14.3%)	
2	64 (83.1%)	13 (16.9%)	
3	41 (85.4%)	7 (14.6%)	
4	17 (100%)	1 (0.5%)	
5	5 (100%)	1 (0.5%)	
>5			
Gestational age			0.191
28-37	130 (89.0%)	16 (11.0%)	
38-42	200 (84.7%)	36 (15.3%)	
>42	4 (66.7%)	2 (33.3%)	
Risk condition of the pregnancy			0.002
High risk	87 (93.5%)	6 (6.5%)	
Low risk	218 (82.0%)	48 (18.0%)	
Complications during pregnancy	29 (100%)	0 (0%)	
Foetal general conditions			<0.001
0	18 (90.0%)	2 (10.0%)	
12-24 hours	185 (98.4%)	3 (1.6%)	
3-7 days	102 (68.9%)	46 (31.1%)	
>7 days	29 (90.6%)	3 (9.4%)	



Table 5 shows women admitted from home had a significantly higher prevalence of sick/complication than those who let themselves to the hospital to give birth (P-value = 0.019). Pregnant women who were on low-risk condition of the pregnancy had a significantly higher prevalence for sick/complication than the high-risk condition of the pregnancy (P-value =0.002). Pregnant women whose neonate stayed in the hospital for 3-7 days had a significantly higher prevalence of sick/complication than other groups (P-value< 0.001).

Table 6: Average Apgar score

Maternal outcome	Average Apgar score	
	First minute	Five minutes
Mode of delivery		
Normal vaginal delivery	8.11	9.28
Assistant instrumental delivery	8.00	9.50
Caesarean section	8.17	9.67
Condition of mother after delivery		
Normal	8.07	9.36
Sick/complication	8.44	9.56

Table 6 shows the mean Apgar score was 8.17 for the first minutes on neonate delivered through caesarean section, which was high as compared to other delivery methods (normal and assistant instrumental) whilst for five minutes, the mean Apgar score was 9.50 on those neonates delivered through assistant instrumental. The mean Apgar score was 8.44 for first minutes and 9.56 for five minutes on neonate whom their mother’s had complications after delivery.

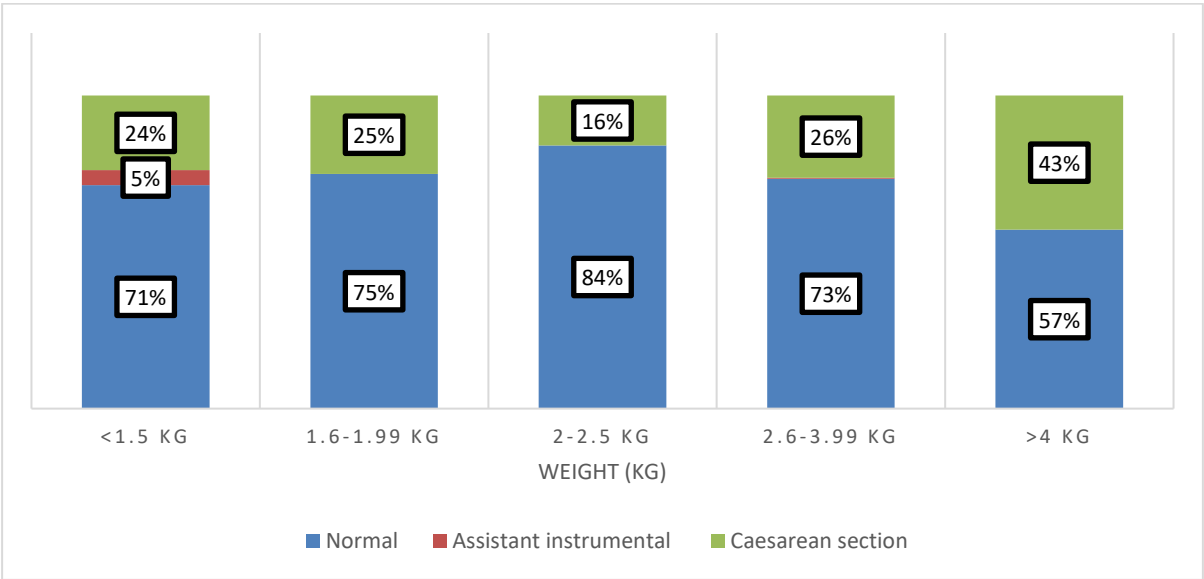


Figure 7: Weight of children delivered

Figure 7 shows forty-three per cent (43%) of the neonate delivered through caesarean section weighed more than 4 kg followed by those who weighed 2.6 to 3.99 kg, 1.6 to 1.99 kg and less than 1.5 kg. Most neonates delivered normal weighed 2 to 2.5 kg (84%).

#### **4.4 DISCUSSION OF THE FINDINGS**

In this study we found that admissions from home were high as compared to self-let to hospital, the majority of the patients surveyed were admitted from home (83% admission from home vs 17% self-let to hospital). The majority of referrals was as a result of an increase in Caesarean section rates for dystocia and failure to progress, with its attendant risks for both the mother and the baby. Of the 389 patients, the majority were aged between 15-25 years (39%) followed by 26-30 years (29%), and lastly, greater between 31-35 years (19%). This finding is supported by Sengoma, Krantz, Nzayirambaho, Munyanshongore, Edvardsson, and Mogren, (2017) who found that usually women with delivery-related complications are admitted from home with ignored symptoms of serious complications. The researcher argues that when complications are left unattended can lead to serious damage to the pregnancy.

The study further found that burden of labour and delivery-related complications such as gravidity (No. of pregnancy), most pregnant women had one and two pregnancies before (30% and 29% respectively). This finding is supported by Keelan, (2018) suggested that majority of women who suffers from complications were once pregnant in their lifetime. Scholars such as Akter et al, (2013) ; Kuepie, (2016) ; Urban, Čok, and Verbič, (2019) come to agreement that pregnant women are most like to experience complications even though they were once pregnant in their lifetime. The study finds that in terms of parity (No of children alive), 31% of the women had one and no children alive. This finding is supported by Akter, Jesmin, Rahman, Islam, Khatun, Yamaguchi, Akashi, & Mizutani, (2013) found that women with no complications are likely to give birth to a baby alive as compared to women who suffered serious complications which can impact the pregnancy. All pregnant women surveyed in Mokopane hospital majority were found to be on 38-42 weeks (38-42) age of the pregnancy followed by 28-37 weeks (38%).

The study found that out of the 389 pregnant women, the majority were at low risk of pregnancy (69%) followed by a high risk of pregnancy (24%). The majority of women gave birth through a normal vaginal delivery with 286 with the percentage of (73.7%) out of 389 patients successfully gave birth normally. The number of women who gave birth through the caesarean section was 100 with a percentage of (25.8%). About 86% of the mothers were normal after delivery whilst 14% were sick or had complications. Duration of stay after delivery, the majority had about 12-24 hours (49.2%) followed by 3-7 days (45.9%).

The study found out that of the 389 captured data, 203 (52.6%) gave birth to a baby boy. About 73% of the neonate weight was between 2.6 and 3.99 kg whilst 11% were between 2 and 2.5 kg followed by <1.5 kg and >5 kg. Duration of neonate stay after delivery, the majority stayed between 12-24 hours (48.5%) followed by 3-7 days (38.1%). Few 5.2% of neonates stayed for less than 12 hours after delivery in the hospital. It can be seen that pregnant women who were at high risk and had complications majority had delivered through caesarean section (59.1% caesarean section vs 39.8% normal; 55.2% caesarean section vs 44.8% normal respectively). As for neonates who stayed in the hospital between 3-7 days most of the women delivered through caesarean section (56.8% caesarean section vs 43.2% normal).

Women admitted from home had a significantly higher prevalence for caesarean section than those who let themselves to the hospital to give birth (P-value = 0.005). Pregnant women who were on high-risk conditions of the pregnancy had a significantly higher prevalence for caesarean section than other groups (P-value < 0.001). Pregnant women whose neonate stayed in the hospital for 3-7 days had a significantly higher prevalence for caesarean section than other groups (P-value < 0.001). Women admitted from home had a significantly higher prevalence of sick/complication than those who let themselves to the hospital to give birth (P-value = 0.019). Pregnant women who were on low-risk condition of the pregnancy had a significantly higher prevalence for sick/complication than the high-risk condition of the pregnancy (P-value = 0.002). Pregnant women whose neonate stayed in the hospital for 3-7 days had a significantly higher prevalence of sick/complication than other groups (P-value < 0.001). The mean Apgar score was 8.17 for the first minutes of neonate delivered through caesarean section, which was high as compared to other delivery methods

(normal and assistant instrumental) whilst for five minutes, the mean Apgar score was 9.50 on those neonates delivered through assistant instrumental. The mean Apgar score was 8.44 for first minutes and 9.56 for five minutes on neonate whom their mother's had complications after delivery.

#### **4.5 CONCLUSION**

The clinical files of pregnant women admitted to the Mokopane hospital from January 2017 to December 2019. Out of the 389 captured data, 286 (73.7%) were delivered through normal virginal as 100 (25.8%) were delivered through Caesarean section. About 86% of the mothers were normal after delivery whilst 14% were sick or had complications.

## **CHAPTER 5: SUMMARY, CONCLUSION AND RECOMMENDATIONS**

### **5.1 INTRODUCTION**

The previous chapter focused on data presentation, analysis and interpretation of empirical findings. Chapter 5 presents the research conclusions and also report the limitations of the study. Recommendations are suggested and limitations are addressed followed by the conclusion of the current study.

This study generated data and comprehensive information on the burden of labour and delivery complication experienced by women giving birth at Mokopane hospital and pregnant women in general. Moreover, the study helped in identifying the problem associated with labour and delivery complications and lay the foundation for further studies, planning and interventions that are aimed at improving the quality of life of the women in labour and their unborn babies. Therefore, the findings of this study provide information to manage women at higher risk of developing complications and understanding the complications in pregnancy.

### **5.2 SUMMARY OF THE STUDY**

In this study, researchers used a retrospective dataset obtained from clinical files of patients admitted to the maternity ward in Mokopane hospital from January 2017 to December 2019. The study involved 389 pregnant women at Mokopane hospital. Of the 389 patients, the majority were aged between 15-25 years (39%) followed by 26-30 years (29%), and lastly, greater between 31-35 years (19%). In this study results indicate, in terms of gravidity (No. of pregnancy), most pregnant women had one and two pregnancies before (30% and 29% respectively). Parity (No of children alive), 31% of the women had one and no children alive. The parity of the delivering mothers is one of the factors that affect obstetric outcomes; a first pregnancy can hurt the morbidity and mortality of pregnant women, as reported by Callahan, Caughey and Heiffnen (2001).

All pregnant women surveyed in Mokopane hospital majority were found to be on 38-42 weeks (38-42) age of the pregnancy followed by 28-37 weeks (38%). Of the 389 pregnant women, the majority were on low risk of the pregnancy (69%) followed by a high risk of the pregnancy (24%), a similar study in northwest Ethiopia indicate that the

number of pregnancy-related complication was high (Zemene, Kebede, Getachew, Tesfahun, Yilma, Tassese and Delele 2020). According to WHO approximately 9.5 million women around the world suffer from pregnancy-related complications and over 300,000 die (Sikder et al., 2011).

A study by Hoque (2011) shows that pregnancy complications during pregnancy are common and estimated between 15 and 25 for every 100 deliveries in the USA. Using the clinical files of pregnant women admitted in the Mokopane hospital from January 2017 to December 2019. Out of the 389 captured data, 286 (73.7%) were delivered through normal vaginal as 100 (25.8%) were delivered through Caesarean section. Caesarean section is one of the most common surgical procedures worldwide. The rate of caesarean section has increased globally from 7% in 1999 to 19% in 2014, however not associated with improved outcomes for mothers and newborns (Zimmo, Laine and Hassan 2018). About 86% of the mothers were normal after delivery whilst 14% were sick or had complications. Results show that the duration of stay after delivery, the majority had about 12-24 hours (49.2%) followed by 3-7 days (45.9%). Short hospital stays for post-delivery mothers could compromise maternal and foetal observations by trained health workers and this might eventually contribute to postpartum maternal and foetal complications that went unseen.

Results show that pregnant women admitted to the Mokopane hospital from January 2017 to December 2019; pregnant women who were at high risk and had complications majority had delivered through caesarean section (59.1% caesarean section vs 39.8% normal; 55.2% caesarean section vs 44.8% normal respectively). The Caesarean section rate may reflect, at least partially, the extent to which pregnant women accesses lifesaving obstetric care (Bertram & Christiansen, 2014).

Women admitted from home had a significantly higher prevalence for caesarean section than those who let themselves to the hospital to give birth (P-value = 0.005). Pregnant women who were on high-risk conditions of the pregnancy had a significantly higher prevalence for caesarean section than other groups (P-value < 0.001). Results show that Pregnant women who were on low-risk condition of the pregnancy had a significantly higher prevalence for sick/complication than the high-risk condition of the pregnancy (P-value = 0.002). (Cowgill, Bishop, Norgaard, Rubens, & Gravett, 2015;

Soma-Pillay, P. and Pattinson, R.C., 2016), indicate that, a significant proportion of serious complications in pregnancy can also occur in women with no recognisable risk factors and a severe complication may progress rapidly to a life-threatening situation.

A pregnancy that has gone smoothly can still have problems when it is time to deliver the baby. Maternal death has decreased worldwide and attention is placed on delivery-related complications and approximately 9.5 million women around the world suffer from pregnancy-related complications and over 300,000 die (Sikder et al., 2011). The labour and birth process are usually straightforward, but sometimes complications arise that may need immediate attention. Pregnancy may be labelled as high risk from the onset of labour (Alfirevic, Stampalija, & Dowswell, 2017) and special attention is given to the women and others are labelled high risk due to the pre-existing medical condition.

Mokopane is a referral hospital to all district hospitals in Waterberg, many complications are experienced. Such complications are amongst others preeclampsia, poor progress of labour, severe perineal tear or third-degree tear, cord prolapse, shoulder dystocia, postpartum haemorrhage, foetal distress, perinatal asphyxia and meconium aspiration. Due to the identified delivery-related problems received in the hospital, the researcher decided to conduct a study in this hospital hence, there has not been an investigation into the burden of delivery complications and therefore this study aims to investigate the burden of labour and delivery complication experienced by women giving birth at Mokopane hospital.

In conclusion, the study aimed to determine the burden of complications related to labour and delivery upon pregnant women at Mokopane Hospital, Limpopo Province. The objectives of the current study were achieved by profiling 389 pregnant women at Mokopane hospital who experience complications during their pregnancy period and also by categorising different types of complications that pregnant women are faced with at Mokopane hospital.

## **5.3 RECOMMENDATIONS OF THE STUDY**

### **5.3.1 Department of Health**

This study is intended to generate data and comprehensive information on the burden of labour and delivery complication experienced by women giving birth at Mokopane hospital. In South Africa, significant changes in health policy, health service delivery, specific protocols, guidelines and recommendations for the management of common causes of maternal death have been developed (Bomela, 2015).

### **5.3.2 For the patients**

The study helped in identifying the problem associated with labour and delivery-related complications, therefore planning and interventions that are aimed at improving the quality of life of the women in labour and their unborn baby are recommended.

### **5.3.3 For knowledge**

The findings of this study provide information to manage women at higher risk of developing complications and understanding the complications in pregnancy and it lay the foundation for further bigger studies.

## **5.4 Limitations of the study**

The focus of this study was limited to the maternal delivery-related complication among pregnant women at Mokopane hospital from January 2017 to December 2019. The study was not applied to other health facilities in Limpopo nor does it apply to the national study. The study was limited to the maternity case record from January 2017 to December 2019 with a total population of 387. There was limited information from the records to categorise the complications experienced by pregnant women attending maternity services at Mokopane Hospital, Limpopo Province

## **5.5 CONCLUSIONS**

The main purpose of this study was to explore the burden of labour and delivery-related complications among pregnant women at Mokopane hospital of Limpopo province. Pregnant women admitted in the Mokopane hospital from January 2017 to December 2019, out of 389 captured data, 286 (73.7%) delivered through normal vaginal as 100 (25.8%) delivered through Caesarean section. The majority were identified as low risk of pregnancy (69%) followed by a high risk of pregnancy (24%).



About 86% of the mothers were normal after delivery whilst 14% were sick or had complications. According to collected data, it shows that Mokopane Hospital has a low rate of labour and delivery-related complications.

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**APPENDICES**

**APPENDIX A: EDITORIAL LETTER**



**University of Limpopo**  
**Department of Linguistics, Translation and Interpreting**  
**School of Languages and Communication Studies**  
**Private Bag x1106, Sovenga, 0727, South Africa**  
**Tel: (015) 268 3707, Fax: (015) 268 2868, email:kubayij@yahoo.com**

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**15 August 2021**

Dear Sir/Madam

**SUBJECT: EDITING OF DISSERTATION**

This is to certify that the dissertation entitled "The burden of labour and delivery-related complications among pregnant women at Mokopane Hospital of Limpopo Province" has been copy-edited and that unless further tampered with, I am content with the quality of the dissertation in terms of its adherence to editorial principles of consistency, cohesion, clarity of thought and precision.

Kind regards



Prof. SJ Kubayi (DLitt et Phil - Unisa)  
Associate Professor  
SATI Membership No. 1002608

*Finding solutions for Africa*



**ANNEXURE B: PERMISSION TO CONDUCT A STUDY DEPARTMENT OF HEALTH, LIMPOPO PROVINCE**

P O Box 2359

Segopje

0744

01 November 2019

The senior manager Department of health  
Private Bag X 9302  
Polokwane  
0700

Dear sir/Madam

**Request for permission to conduct a research study**

I am a student at the University of Limpopo (UL) currently registered for a Master's degree in public health. I hereby request permission to conduct a research study at the Waterberg district at Mokopane Hospital.

My research supervisor is Doctor Maimela, Department of Medical Sciences, Public Health and Health Promotion University of Limpopo, Turfloop campus. The study is entitled: **the burden of labour and delivery-related complications at Mokopane hospital Limpopo province**. The study aims to determine the burden of complications related to labour and delivery at Mokopane hospital.

I require delivery files of pregnant women to assist me with obtaining data. Profiling of delivery case records will be done without the patient knowing to determine the burden of complications related to labour and delivery at Mokopane hospital.

Attached are the research proposal and the ethical clearance certificate from UL.

Thank you in anticipation of a positive response and for the efforts to be taken to assist me in this regard.

Best Regards,

Seabi Mabore Ameliah

Email: [mabsaseabi@gmail.com](mailto:mabsaseabi@gmail.com)

Cell: 073 034 7661

**APPENDIX C: QUESTIONNAIRE**

**RESEARCH TITLE: THE BURDEN OF LABOUR AND DELIVERY RELATED, COMPLICATIONS AT MOKOPANE HOSPITAL**

**NB.** Fill the questionnaire for deliveries assisted at Mokopane regional hospital in 2019 including referral made for delivery service.

**1. Labouring mother identification**

a. Maternity record number \_\_\_\_\_

b. Name of Health Service where Antenatal care service attended \_\_\_\_\_

c. Age (tick appropriate age group)

15-25		26-30		31-35		>36	

d. Admission from home

Yes

No, indicate name of referral clinic \_\_\_\_\_

**2. Obstetric history of the mother**

a. Gravidity (No. of pregnancy)

1		2		3		4		>5	
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b. Parity (No of children alive)

0	1		2		3		4		5		>6	
---	---	--	---	--	---	--	---	--	---	--	----	--

c. Gestational age at the time of delivery in weeks

28-37		38-42		>43	
-------	--	-------	--	-----	--

d. Risk condition of the pregnancy

- High risk
- Low risk
- COMPLICATION DURING PREGNANCY

State the complication .....

**3. Maternal outcome**

a. . Mode of delivery

- Normal virginal delivery
- Assistant instrumental delivery
- Referral to caesarean section (indication for c/section)

b. Condition of mother after delivery

- Normal
- Sick/complication (indicate) \_\_\_\_\_
- Death

c. Duration of stay after delivery

- 12-24 hours
- 3-7 days
- >7 days

**4. Fetal outcome**

a. Sex of the New-born

- Boy
- Girl

b. Weight of the new-born at birth

<1.5 kg		1.6-1.99kg		2-2.5kg		2.6-3.99kg		< 4kg	
---------	--	------------	--	---------	--	------------	--	-------	--

c. Apgar score

- First minutes \_\_\_\_\_
- Five minutes \_\_\_\_\_

d. Duration of a neonate stayed in hospital after delivery

- 12-24 hours
- 3-7 days
- >7 days

e. General condition of the new-born after delivery

- Normal
- Congenital malformation (if any, indicate)  
\_\_\_\_\_
- Still-birth
- Other complication \_\_\_\_\_

## APPENDIX D FACULTY APPROVAL LETTER



**University of Limpopo**  
**Faculty of Health Sciences**  
**Executive Dean**

Private Bag X1106, Sovenga, 0727, South Africa  
Tel: (015) 268 2149, Fax: (015) 268 2685, Email: kgakgabi.letsoalo@ul.ac.za

DATE: 11 AUGUST 2020

**NAME OF STUDENT:** SEABI MA  
**STUDENT NUMBER:** 201831904  
**DEPARTMENT:** PUBLIC HEALTH  
**SCHOOL:** HEALTH CARE SCIENCES  
**QUALIFICATION:** MPH

Dear Student

### FACULTY APPROVAL OF PROPOSAL (PROPOSAL NO. FHDC2020/5)

I have pleasure in informing you that your MPH proposal served at the Faculty Higher Degrees Meeting on the 29 JUNE 2020 and your title was approved as follows:

Approved Title: "The Burden of Labour and Delivery related Complications among Pregnant Women at Mokopane Hospital of Limpopo Province"

### Note the following:

Ethical Clearance	Tick One
Requires no ethical clearance Proceed with the study	<input type="checkbox"/>
Requires ethical clearance (TREC) (apply online) Proceed with the study only after receipt of ethical clearance certificate	<input checked="" type="checkbox"/>

Yours faithfully

**MR K.J Letsoalo**  
Chairperson

CC: Supervisor: DR E Malmela  
Co-Supervisor: Prof MK Thopola

*Finding solutions for Africa*

## APPENDIX E ETHICAL CLEARANCE



**University of Limpopo**  
Department of Research Administration and Development  
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**TURFLOOP RESEARCH ETHICS COMMITTEE**  
**ETHICS CLEARANCE CERTIFICATE**

**MEETING:** 21 October 2020

**PROJECT NUMBER:** TREC/310/2020: PG

**PROJECT:**

**Title:** The Burden of Labour and Delivery Related Complications among Pregnant Women at Mokopane Hospital of Limpopo Province  
**Researcher:** MA Seabi  
**Supervisor:** Dr E Maimela  
**Co-Supervisor/s:** Prof MK Thopola  
**School:** Health Care Sciences  
**Degree:** Master of Public Health

**PROF P MASOKO**

**CHAIRPERSON: TURFLOOP RESEARCH ETHICS COMMITTEE**

The Turfloop Research Ethics Committee (TREC) is registered with the National Health Research Ethics Council, Registration Number: REC-0310111-031

**Note:**

- i) This Ethics Clearance Certificate will be valid for one (1) year, as from the abovementioned date. Application for annual renewal (or annual review) need to be received by TREC one month before lapse of this period.
- ii) Should any departure be contemplated from the research procedure as approved, the researcher(s) must re-submit the protocol to the committee, together with the Application for Amendment form.
- iii) PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES.

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## APPENDIX F DEPARTMENT OF HEALTH APPROVAL



**LIMPOPO**  
PROVINCIAL GOVERNMENT  
REPUBLIC OF SOUTH AFRICA

### Department of Health

Ref : LP\_2020\_10\_040  
Enquires : Ms PF Mahlakwane  
Tel : 015-293 6028  
Email : Kurhula.Hlomane@dhsd.limpopo.gov.za

Mabore Seabi

#### PERMISSION TO CONDUCT RESEARCH IN DEPARTMENTAL FACILITIES

Your Study Topic as indicated below;

THE BURDEN OF LABOUR AND DELIVERY RELATED COMPLICATIONS AMONG PREGNANT WOMEN AT MOKOPANE HOSPITAL OF LIMPOPO PROVINCE

1. Permission to conduct research study as per your research proposal is hereby Granted.
2. Kindly note the following:
  - a. Present this letter of permission to the institution supervisor/s a week before the study is conducted.
  - b. In the course of your study, there should be no action that disrupts the routine services, or incur any cost on the Department.
  - c. After completion of study, it is mandatory that the findings should be submitted to the Department to serve as a resource.
  - d. The researcher should be prepared to assist in the interpretation and implementation of the study recommendation where possible.
  - e. The approval is only valid for a 1-year period.
  - f. If the proposal has been amended, a new approval should be sought from the Department of Health
  - g. Kindly note that, the Department can withdraw the approval at any time.

Your cooperation will be highly appreciated

  
Director Research  
Dr. Ramalivhana NJ

  
Date

Private Bag X9302 Polokwane  
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