DEVELOPMENT OF STRATEGIES TO ENHANCE PREVENTION OF PRETERM LABOUR IN THE SELECTED HOSPITALS IN CAPRICORN DISTRICT, LIMPOPO PROVINCE

MASTER IN NURSING

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DEVELOPMENT OF STRATEGIES TO ENHANCE PREVENTION OF PRETERM LABOUR IN THE SELECTED HOSPITALS IN CAPRICORN DISTRICT, LIMPOPO PROVINCE

by

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DISSERTATION

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DECLARATION

I declare that the dissertation **"DEVELOPMENT OF STRATEGIES TO ENHANCE PREVENTION OF PRETERM LABOUR IN THE SELECTED HOSPITALS IN CAPRICORN DISTRICT, LIMPOPO PROVINCE"** hereby submitted to the University of Limpopo, for the degree of Master of Nursing has not previously been submitted by me for a degree at this or any other university; that it is my work in design and in execution, and that all material contained herein has been acknowledged both.

Makakaba GM (Miss): _____   Date: 25th November 2021.

DEDICATION

This dissertation is dedicated to:

- My mother, Johanna Mmamokoele Makakaba, for her continuous support, encouragement and love;
- To the memory of my beloved grandfather, Bernard Makakaba; grandmother, Japhia Makakaba; and my brother, George Patsi Makakaba;
- My siblings, Hendrick, and Grace Makakaba, for the continuous understanding, love, support and taking care of my children when I was held up in my studies
- My lovely, beautiful children, Tebogo, Olebogeng and Omphile Makakaba, for their understanding and love;
- My life partner, for his continuous support and love; and
- Lastly, it is dedicated to all mothers, midwives and obstetricians who participated in this study.

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ABSTRACT

Background

Despite all the interventions that have been developed previously preterm labour remain to be the leading cause of perinatal morbidity and mortality worldwide. Preterm labour occurs before 37 weeks of gestation under two obstetric circumstances namely, 'spontaneous preterm labour' and 'indicated preterm labour'. The aim of the study was to develop the strategies to enhance prevention of preterm labour in selected hospitals in Capricorn District, Limpopo Province.

Research Method

A sequential explanatory mixed method was adopted, the study was conducted in three phases, namely, quantitative study, qualitative study, and development of strategies. Self-developed questionnaires with 50 item questions each for mothers and registered midwives were administered. Both questionnaires were pre-tested prior to being administered to the respondents of the main study.

The sample size of mothers was 77 mothers and 62 registered midwives. Data collected from the respondents were analysed using Statistical Package for Social Science (SPSS) version 25 with the help of the statistician. Tables, pie charts and bar graphs were drawn to present the results.

The results of quantitative phase were utilized to formulate the Interview Guides that were used to explore the knowledge and practise of registered midwives and obstetricians regarding preterm labour. Interviews were conducted with 20 mothers, 6 registered midwives and 4 obstetricians until data saturation was reached. Data were analysed qualitatively using Tesch's Open-Coding method.

Quantitative Results

The quantitative results for midwives revealed that about 60% of the mothers who had preterm labour were teenagers. Most of the respondents had 'spontaneous preterm labour' and did not have any comorbidities while few had 'indicated preterm labour' and were induced. All 62(100%) of the midwives showed that the facility does not offer an Outreach Programme on the prevention of preterm labour.

Themes and Sub-Themes Results

Themes and sub-themes were coded manually. Results that emerged from the integration and comparison of quantitative and qualitative results revealed that the mothers who went into preterm labour spontaneously had little information or no health education regarding preterm labour.

Developed strategies

The following strategies were developed based on the identified factors that might hinders the prevention of preterm labour and after exploring the knowledge and practice of midwives and obstetricians in the selected hospitals, Capricorn District, Limpopo Province. Strategies includes strengthening of BANC Plus, staff establishment, laboratory turnaround time, outreach programmes and improvement of counselling and support services.

Recommendations of the Study

The recommendation of the study is divided into three groups which includes recommendations for midwives at the PHC and hospital, recommendations for the obstetricians at the hospital and the recommendations for the Department of Health. The midwives to visit schools and community centres at least twice in a month to give information to the woman of childbearing age and reinforce health education on each Antenatal Care visit.

The obstetricians to screen all mothers who are at risk of preterm labour for infections, follow up the results and treat the mothers accordingly. The Department of Health should hire enough staff so that quality care can be

rendered to the pregnant woman at the PHC and hospital. The Department of Health should develop the electronic database, to register all mothers who have a history of preterm labour, so that when they are pregnant the database system will also help to identify them at the PHC, and they would then be referred to the hospital in time. If the developed strategies to enhance prevention of preterm labour may be adopted and adhered to by the midwives and obstetricians, these may help in reduction of high figures of preterm labour in the selected hospitals.

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DEFINITION OF CONCEPTS

Enhance

'Enhance' refers to further increasing the good quality, value, or status of something (Hornby, 2010). In this study, the term 'enhance' refers to actions that will be taken to improve the current state of practice regarding the preventative measures of preterm labour in pregnant women who have a history of preterm labour.

Strategies

Nickols (2012) defines 'strategies' as an approach to a problem, which involves the first step in linking the means or resources at our disposal with the ends or results we hold in view. In the study, 'strategies' refers to several steps to be taken to improve the quality of maternal care with a history of previous preterm labour to prevent possible subsequent preterm labour.

Preterm labour

'Preterm labour' refers to labour that occurs in a pregnancy of more than 20 weeks of gestation but less than 37 weeks or 259 days of gestation which end up with the outcome of premature neonates (Nolte, 2011; WHO 2012). The 'preterm labour' is further divided into sub-categories, namely, extreme preterm labour (<28 weeks), very preterm labour (28-<32 weeks) and, lastly, moderate to late preterm labour (32 to <37 weeks). In this study, 'preterm labour' refers to labour that occurs after 20 weeks of gestation and before 37 weeks of gestation, which can be 'spontaneous' or 'indicated preterm labour'.

Prevention

'Prevention' is defined as measures taken before and during pregnancy to improve the health of the mother and decrease the risks of her or the baby developing preventable adverse pregnancy conditions (Appiah-Sakyi, Shaikh & Abid, 2017). In this study, 'prevention' refers to all interventions done to the pregnant mother with a history of previous second trimester miscarriages and history of preterm labour to reduce subsequent preterm labour. Interventions that may be done antenatally include

insertion of cervical cerclage, cervical pessary, prescription of low dose of aspirin and progesterone 250 mg intramuscular weekly dose. Secondary prevention is done when a pregnant woman presents with preterm labour and *tocolytic* treatment is administered to the mother to stop preterm labour from progressing and prevent preterm birth.

LIST OF ABBREVIATIONS/ACRONYMS

BMI	Body Mass Index
BANC	Basic Antenatal Care
DoH	Department of Health
NICU	Neonatal Intensive Care Unit
PHC	Primary Health Care
PNMR	Perinatal Mortality Rate
PROM	Preterm Rupture of Membranes
PPIP	Perinatal Problem Identification Program
PPROM	Preterm Premature Rupture of Membranes
PTL	Preterm Labour
SPSS	Statistical Package for Social Sciences
TDS	Thrice daily
TREC	Turfloop Research Ethics Committee
WHO	World Health Organization

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CHAPTER 1
OVERVIEW OF THE STUDY

1.1 Introduction and Background

Globally, preterm labour occurs before 37 weeks of gestation under two obstetric circumstances namely, 'spontaneous preterm labour' and 'indicated preterm labour' (Howson, Kinney, McDougall & Lawn, 2013). Furthermore, the 'spontaneous preterm labour' occurs because of the spontaneous onset of labour, whereas 'indicated preterm labour' occurs because of maternal obstetric complications such as pre- eclampsia, and foetal condition such as Intrauterine Growth Restriction (Romero, Yeo, Miranda, Hassan, Counde-Agudelo & Chaiworapongsa, 2013). The World Health Organisation (2012) sub-categorised preterm birth according to the gestational age, whereby extremely preterm birth of more than 28 weeks, very preterm birth is from 28 to less than 32 weeks and moderate to late preterm is from 32 to less than 37 weeks.

According to the research done globally by Romeo et al. (2013), preterm birth because of preterm labour is the leading cause of perinatal morbidity and mortality worldwide. Preterm birth accounts for 85% of early infant death which is not secondary to congenital abnormalities (Georgiou, Di Quinzio, Permezel & Brennecke, 2015). The mortality rate has declined by more than half, because of the interventions that were introduced in the past to prevent preterm labour, but the United Nations Millennium Development Goal four target of two-third reduction was not reached (Van Zij, Koullali, Mol, Pajkrt & Oudijk, 2016).

Despite all the interventions that have been implemented, the solution to the problem of preterm birth remains elusive globally (Markham & Klebanoff, 2019). Hence preterm birth continues to be a leading cause of death in the low- and middle-income countries on children under the age of five years. Therefore, understanding the major causes of preterm mortality is an important step in establishing which of these interventions to prioritise (Kinney & Rhoda, 2019). Lawn and Kinney (2014) mentioned that, globally, the infections during pregnancy, including malaria, and a heavy workload in the fields for pregnant women coming

from the low- income countries are the common causes of preterm birth. Lawn and Kinney (2014) believe that if more focus can be emphasised on family planning and prevention of maternal infections, these might assist in the reduction of preterm birth.

Moreover, preterm neonates who survive require appropriate treatment and without it, some of them face a lifetime of disability, including learning disabilities, visual and hearing problems (World Health Organisation, 2012). The World Health Organisation (2012) stated that in sub-Saharan Africa and South Asia about 9.1 million (12.8%) neonates are born yearly as premature because of preterm labour. In South Africa, about 60% of premature deaths are neonates who are born with extreme low birth weight, they die as a results of extreme organ immaturity (Rhoda, Velaphi, Gebhardt, Kauchali & Barron, 2018).

The Saving Babies Report (2014-2016) reported that in the Perinatal Problem Identification Program (PPIP) data compiled. The monthly mortality rate of all deliveries in South Africa under the category of more than 500 grams (g) the main primary obstetric cause of death is 'spontaneous preterm labour' accounting for 22.9%.

With regard to the situation in South Africa, García-Basteiro, Quinto, Macete, Bardajı, Raquel González, Nhacolo and Sigauque (2017) emphasize that understanding the impact of preterm birth is important and it will help to improve in the management of preterm births. These will also assist to prevent their consequences in the low-income countries with high rates of preterm births mainly the Southeast Asia and Africa.

Furthermore, in the Saving babies report (2014-2016) shows that in South Africa, on the category of more than 500g, the final neonatal cause of all neonatal deaths as indicated in the PPIP data is immaturity, which is associated with 'spontaneous preterm labour', and it is accounting for about 48.1% of the neonatal deaths. In the Perinatal Mortality Rate (PNMR) per province, for the period 2014-2016, as indicated in the PPIP data, the top three provinces with a high PNMR in the category of more than 500g are Free State with 39.9, Northern Cape with 36.3 and

Limpopo Province with 34.4. Moreover, in the ranking of Perinatal Mortality Rate (PNMR) per 1000 deliveries for 'spontaneous preterm labour' the following districts, namely, Capricorn, Lejweleputswa, and Bojanala, are number three with a rate of 6.4.

In the study that was conducted in Limpopo Province, over 90% of preterm babies die within ten days of their lives due to pneumonia, lack of neonatal facilities with inadequate equipment's to provide quality care, few nursing staff were trained in in new-born care. The prevention of preterm labour was the greatest challenge as pregnant woman would arrive at the hospitals when delivery of the neonate is imminent (Mahwasane, Maputle, Simane- Netshisaulu & Malwela, 2020).

The primary prevention to reduce the risk of preterm labour includes the intervention that are directed to all pregnant women who are at risk of having 'spontaneous preterm labour'. Other strategies of WHO (2015) were directed on the primary prevention, which include smoking cessation programmes, cervical cerclage insertion and progesterone agents administration. However, the most beneficial set of maternal interventions are those that could improve survival chances and health outcomes of preterm neonate when preterm birth is inevitable thus reducing Perinatal Mortality Rate that is caused by preterm birth (WHO 2015). The study was based on the prevention of preterm labour and afterwards the strategies was developed to enhance the prevention of preterm labour in the selected regional and tertiary hospitals in Limpopo Province.

1.2. Problem Statement

Despite many initiatives that have been done on the phenomena that the researcher is interested in, the problem of preterm labour still occurs to date. The researcher observed that almost every week mothers who delivered premature neonates from the peripheral hospitals are being admitted at Antenatal Unit for mother lodger in the Postnatal Unit of the Mankweng Hospital. The obstetricians examine and admit the mothers in antenatal unit because there is no postnatal clinic structure in the facility and the obstetricians are also stationed in the antenatal unit and labour unit daily. The mothers are admitted because their neonates are admitted for neonatal facility, the researcher observed the unit admission registers.

Moreover, there are still mothers who give birth to premature neonates in Mankweng Hospital daily who come from the local areas. The Mankweng neonatal intensive care unit, monthly statistics shows prematurity as the number one admitting diagnose with ± 100 of preterm neonates admitted per month out of ±190-200 total number of admissions (Mankweng Neonatal Intensive Care Unit Monthly Statistics, 2018).

The high number of preterm neonates admission caught attention of the researcher, hence the researcher is interested in developing the strategies to enhance the prevention of preterm labour. WHO (2012) stated that preterm births occur in Africa, South Asia, Northern Africa, Western Asia, Latin America, and Caribbean. Besides, preterm births also occur in developed countries such as Central & Eastern Asia, South-Eastern Asia & Oceania, in sub-Saharan Africa and South Asia. The study about the common cause of neonatal death in Polokwane Mankweng hospital complex is preterm birth, with 52% on neonates of < 29 days and 26.8% on under-five years children, during the period 2008-2010 was conducted by (Ntuli, Malanga & Alberts, 2013).

1.3 Theoretical Framework

The researcher's study is guided by the Mercer's Theory of Maternal Role Attainment. Mercer's Theory of Maternal Role Attainment focuses on the adolescence, older mothers, mothers with defective children, ill mothers, families experiencing *antepartum* stress, parents at high risk, and mothers who had deliveries and the following four concepts nursing, environment, person, and health (Basavanthapa, 2007). The theory of Mercer aligns with the study because the participants are mothers of childbearing age who can be either adolescent mothers or older mothers and the concepts used.
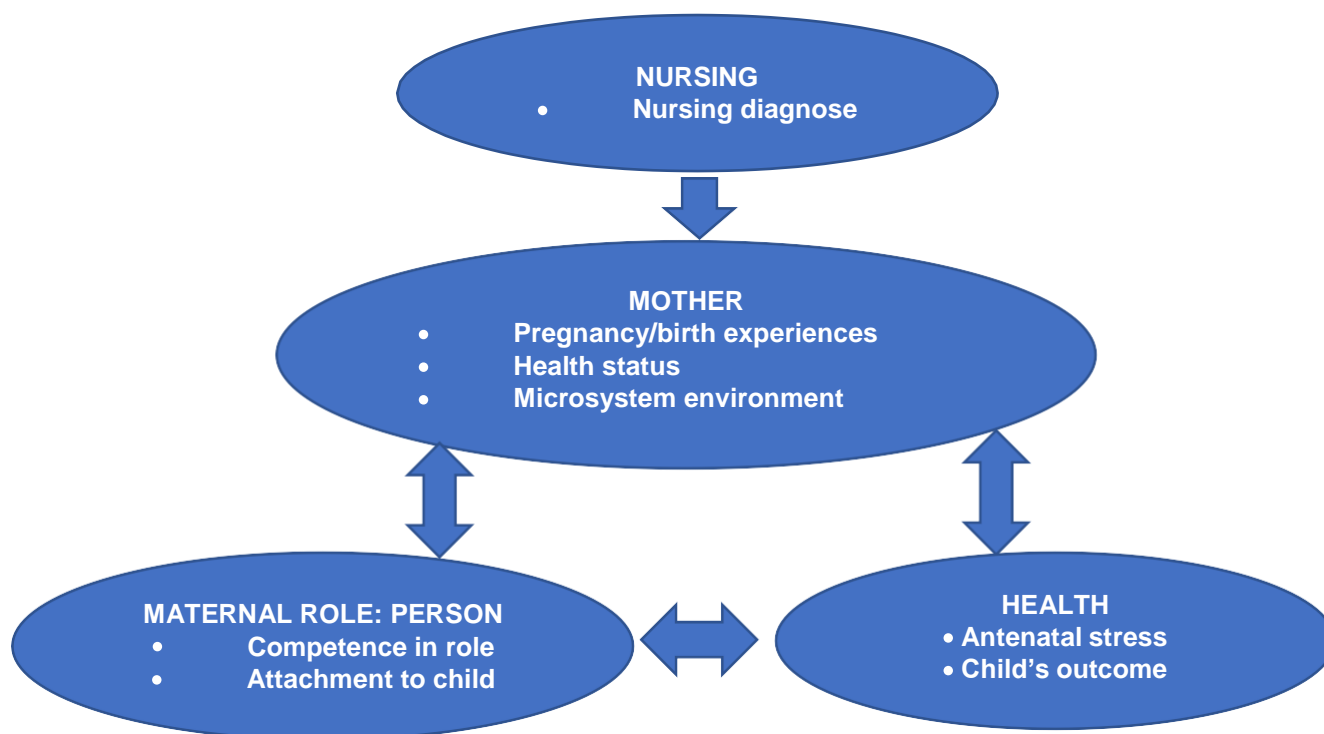
Figure 1.1: Mercer's Theory Maternal Role Attainment

Figure 1.1 shows that Mercer's Theory of Maternal Role Attainment is suitable for the research. The theory has four concepts which includes, nursing, mother, health, and maternal role. These concepts work hand in hand to help the mother who delivered a premature neonate to achieve the maternal role attainment. The concepts are discussed below.

• Nursing

According to Basavanthapa (2007), Mercer's Theory of Maternal Role Attainment refers to 'nursing' as a science emerging from a "turbulent adolescence to adulthood". Nurses are the health professionals having the most "sustained and intense interaction with the women in the maternal cycle". In Mercer's Theory of Maternal Role Attainment, obstetrical nursing is the diagnosis and treatment of women's and men's responses to actual or potential health problems during pregnancy, childbirth, and the postpartum period.

The obstetrical nursing in the study is done by the midwives at the PHC and the selected hospitals, and obstetricians at the selected hospitals. This theory supports the researcher's study because the midwives at the primary level of care identify pregnant women who are at risk of preterm labour, and they refer them to another multidisciplinary team for further management at the hospitals.

- Environment

Mercer's Theory of Maternal Role Attainment does not define 'environment', but rather addresses the individual's culture, mate, family and/or support network, and size of that network as it relates to maternal role attainment (Basavanthapa, 2007). A mate's love, support and nurturance were important factors towards enabling a woman to mother her child. The mate, parents, family, and friends were identified as source of coping and help for the new mother.

Basavanthapa (2007) states that Mercer's Theory of Maternal Role Attainment has a supportive response to provide sanction for their mothering role and seemed to communicate confidence in their ability to mother. Mercer's Theory of Maternal Role Attainment Basavanthapa (2007) involves the immediate environment in which maternal role attainment occurs is the microsystem, which includes the family and factors such as family functioning, mother-father relationship, social support, and stress.

The theory supports the researcher's study because prior planned pregnancy an obese/undernourished woman need to optimize their body weight by developing a regimen for healthy diet, and all this can be achieved by family support. In case where a preterm labour has occurred, the love and support system rendered by the family, midwives and obstetricians should be enough to enable the mother to take care of her neonate.

- Person

Mercer's Theory of Maternal Role Attainment refers a person as "self or core-self". She views the self as separate from the role that are played. Through maternal individual, a woman regains her "personhood" as she extrapolates her "self" from the mother-infant dyad (Basavanthapa, 2007). The core self evolves from the culture context and determines how situations are shaped.

In the researcher's study, 'person' refers to the pregnant women with a history of 'spontaneous' or 'indicated' preterm labour or recently delivered a premature neonate whereby now the mother develops coping mechanism that will assist her in the

parenthood.

- Health

According to the Mercer's Theory of Maternal Role Attainment, health status is defined as the health status of the neonate is the extent of the pathology present and infant health status by parental rating of the overall health (Basavanthapa, 2007). The health status of a family is negatively affected by *antepartum* stress.

Mercer's Theory of Maternal Role Attainment supports the researcher's study simply because it focuses on the *antepartum* health status of the pregnant woman, which includes avoiding stress during pregnancy as stress can predispose them to deliver premature neonates and their neonates end being admitted in NICU due to neonatal complication such as respiratory distress syndrome. The health status of the neonate who is admitted in NICU can negatively affect the mother's health by causing the mother to have *puerperal psychosis.*

1.4 Aim of the Study

The aim of the study is to develop the strategies to enhance prevention of preterm labour in Seshego, Mankweng and Pietersburg Hospitals in the Capricorn District, Limpopo Province.

1.5 Research Question

- What are the developed strategies used in current practice to enhance the prevention of preterm labour in selected hospitals in the Capricorn District, Limpopo Province?

1.6 Objective of the Study

- To identify the factors that hinder the prevention of preterm labour in the selected hospitals in the Capricorn District, Limpopo Province.
- To explore the knowledge and practice of midwives and obstetricians in preventing preterm labour in the selected hospitals in the Capricorn District,

Limpopo Province.

- To develop strategies to enhance prevention of preterm labour based on the findings of the study.

1.7 Research Methodology

The mixed methods research was used in the study to help the researcher to gain a more complete picture about the phenomenon as it integrates quantitative and qualitative study. According to Creswell (2014), the sequential explanatory mixed method means that data collection and analysis of quantitative results is followed by data collection and analysis of qualitative results. This approach was suitable as the researcher intended to develop strategies to enhance the prevention of preterm labour because data were to be collected from pregnant woman with a history of preterm labour, mothers who delivered premature neonates, analyse quantitative research results.

The use of mixed method enables the researcher to confirm, cross-validate and corroborate the findings of the study (Babbie, 2014). Both quantitative and qualitative research were conducted in the selected hospitals in the Capricorn District, Limpopo Province. This study was conducted within a mixed method research quantitative and qualitative research paradigm. A sequential exploratory design was used in the study with the aim of developing strategies to enhance prevention of preterm labour in the selected hospitals.

A total number of three hospitals in the Capricorn District were used to collect data. The target population were mothers who delivered preterm neonates, mothers with a history of preterm labour who were found in ANC Ward, mothers who came for high-risk clinic, postnatal ward KMC room and Mother's Lodger Ward, midwives who are allocated in Antenatal Ward and Labour Ward and obstetricians.

1.8 Significance of the Study

The strategies developed from this study – if were to be followed by the midwives at PHC during Antenatal Care visits of mothers with a history of preterm labour and at the hospital during preterm labour at the PHC and hospital – might help to reduce the high numbers of preterm labour and preterm birth and improve the quality of nursing

care rendered. The strategies developed from the study might help to empower women of childbearing age with the relevant health information that will enable them to respond early when they have preterm labour. These might reduce the high numbers of mothers who deliver preterm neonates in the selected hospitals.

The strategies developed might help to reduce the burden of the obstetricians at the hospitals and improve quality of care on mothers with a history of preterm labour or mothers who present with preterm labour. This will reduce the high numbers of mothers who deliver preterm neonates. The strategies developed from this study might be utilised by the Limpopo Department of Health and the Limpopo Province to amend the protocols and review the maternal guidelines. The strategies developed might contribute to the reduction of Perinatal Mortality Rate because the major common cause of death in Polokwane-Mankweng Hospital Complex is preterm birth with 52% on neonates of <29 days and 26.8% on under-five years children, during the period 2008-2010 (Ntuli et al., 2013).

1.9 Outline of Subsequent Chapters

Chapter 2: Literature Review
Literature reviews include the predisposing factors, common causes of preterm labour and preventative measures of preterm labour.

Chapter 3: Research Methodology
This chapter presents the research methodology, research design, study site, population and sampling, data collection method, validity and reliability, data analysis, measures to ensure trustworthiness, bias, and ethical consideration.

Chapter 4: Presentation and Discussion of Quantitative Results
This chapter discusses the quantitative results of the study findings in the two groups of the study population, which involves mothers and the midwives who participated in the study. The quantitative results are represented in the forms of figures, graphs, tables, and narration.

Chapter 5: Presentation and Discussion of Qualitative Results, Integration of Quantitative and Qualitative Results and Development of Strategies

The chapter discusses the quantitative results of the study findings in the three groups of participants which are in the form of themes and sub-themes, integration of both quantitative results, qualitative results, and the development of strategies in relation to the study conducted in the selected hospitals. The three groups involve the mothers, midwives, and the obstetricians.

Chapter 6: Summary, Limitations, Recommendations and Conclusion

The chapter discusses the summary, limitations, recommendations, and conclusion. Recommendations are based on the findings of the study in relation to development of strategies to enhance prevention of preterm labour.

1.10 Conclusion

Chapter one discussed the incomplete overview of the study which includes introduction and background of preterm birth. Whereby, the keyword preterm birth and preterm labour were explained at length. The literature reviewed shows how preterm labour is still a problem to date globally, in South Africa and within Limpopo province. The problem statement shows how that preterm birth is major admitting diagnose in hospital A and the aim of the study involves development of strategies to enhance prevention of preterm labour.

The objectives of the study were discussed to show how the researcher is going to develop the strategies to enhance the prevention of preterm labour. Research methodology discusses the method of research used in the study. The significance of the study discussed how the study might empower woman of childbearing age with relevant health information and might help reduce high numbers of mothers who deliver preterm neonates in the selected hospital.

CHAPTER 2
LITERATURE REVIEW

2.1 Introduction

The previous chapter discussed the overview of the study, this chapter discusses the literature review which is based on the strategies to enhance the prevention of preterm labour starting from Africa, sub-Saharan, South Africa and Provincially. The literature review enabled the researcher to gain broader perspective on the existing knowledge base of the research title.

Literature reviews include the predisposing factors, common causes of preterm labour and preventative measures of preterm labour. Literature review was obtained through articles on Science Direct, Google Scholar and textbooks. Preterm labour refers to labour that occurs in a pregnancy of more than 20 weeks of gestation but less than 37 weeks or 259 days of gestation which end up with the outcome of premature neonates (Nolte, 2011; WHO, 2012).

Literature review is a systematic, explicit approach to the identification, retrieval, and bibliographical management of independent studies for the purpose of locating information on a topic, synthesizing conclusions, identifying areas for further studies, and developing guidelines for clinical practice (Brink, Van der Walt & Van Rensburg, 2012).

Carrie, Shapiro-Mendoza, Wanda, Barfield, James et al. (2016), mentioned that the strategies to reduce preterm births and its complication includes the need to access the preconception care services which involves screening, health promotion, and interventions that will enable them to achieve high levels of wellness, minimize risks, and enter a pregnancy in an optimal health. Moreover, Newnham, Dickinson, Hart, Pennell, Arrese and Keelan (2014) further outline the strategies to prevent preterm birth as follows; prevention of non-medically induced late preterm births, progesterone supplementation during pregnancy administered on mothers with a history of preterm labour. Cervical cerclage insertion, prevention of cigarette smoking during pregnancy, judicious use of fertility treatments may result in multiple pregnancy which is one of

the risk factors of preterm labour and birth and a dedicated preterm birth prevention clinic (Newnham et al., 2014). The theory of Mercer emphasizes that preventative measure should be taken into consideration at the antenatal phase by the nurses because the antenatal stressors can affect the health of the mother and the pregnancy outcome. Mercer's theory supports the literature review in the paragraph (Basavanthappa, 2007)

The researcher gathered information from published studies, identified similarities and differences, and came up with a conclusion which assisted the researcher to develop the strategies to enhance the prevention of preterm labour. Literature review in this study was based on the strategies to enhance the prevention of preterm labour starting from Africa, sub-Saharan, South Africa and provincially. The literature review enabled the researcher to gain broader perspective on the existing knowledge base of the research title. Literature review included the predisposing factors, common causes of preterm labour and preventative measures of preterm labour.

2.2 Predisposing Factors of Preterm Labour

According to the study conducted by Villie and Rozenberg (2018), pregnant women with a history of preterm labour, third trimester miscarriage, uterine malformation, multiple pregnancies, intrauterine infection, or inflammation are at high risk of having subsequent preterm labour. Another predisposing factors are maternal or foetal related condition such as pre-eclampsia and foetal malformations; smoking; excessive physical work; alcohol intake; drug consumption; and periodontal disease increase the chances of preterm labour (Renzo, Tosto & Giardina, 2018).

However, in the study conducted by Delnord and Zeitlin (2019), they reported that the spontaneous preterm birth was associated with Diabetes Mellitus, *polyhydramnios*, oligohydramnios, placental ischemia, hypoxia, and previous preterm birth. In indicated deliveries, pre-eclampsia/eclampsia, hypertension, Diabetes Mellitus, small for gestational age and placental abruption were strongly associated with preterm and early term deliveries, but not other maternal chronic conditions, including respiratory diseases, anaemia, hormonal diseases, and gastrointestinal diseases which were associated with early term deliveries (Delnord & Zeitlin, 2019).

There has been a decline in the overall of preterm birth rates in the United States during 2007 and 2014. The preterm birth rate decreased by 8.4%, from 10.41% to 9.54% of live births. This was achieved by teenage pregnancy prevention and family planning (Ferré, Callaghan, Olson, Sharma & Barfield, 2016). However, factors such as advanced maternal age, assisted reproductive technologies, non-indicated Caesarean Sections, obesity, and hypertension still contribute about half of the increase in number of preterm births in the high-income countries (Lawn & Kinney, 2014).

In a European country, migration status, short interpregnancy intervals, previous preterm birth, induced previous termination of pregnancy, smoking, BMI, alcohol consumption and the pre-existing medical condition are associated with preterm births in the country (Delnord, Blonde & Zeitlin, 2015; by Koullai, Oudiijk, Nijman, Mol and Pajkrt 2016). Moreover, in the study conducted by Koullai et al., (2016), they emphasized that women who continue to smoke during pregnancy are at high risk of preterm labour than those who quit smoking before 15 weeks of gestation.

The association between spontaneous preterm birth and smoking during pregnancy is stronger on very preterm births than on moderate preterm births (Koullai et al., 2016). Furthermore, Koullai et al., (2016) mentioned that African and Afro-Caribbean women are known to be at high risk of preterm labour as compared to Caucasian women and women from low socio-economic status and low educational status. The high rates of preterm labour were observed on pregnant women with low BMI and high BMI. Obesity is a global problem with an estimated 300 million of childbearing age women who are obese (WHO, 2011).

Gondwe, Ashorn, Ashorn, Dewey, Maleta, Nkhoma, Mbotwa and Jorgensen (2018) said that pregnant women with a BMI of<18,5kg/m2 (undernourished) are at risk of having a preterm labour and deliver a low birthweight neonate, small for gestational age and stillbirth. Pregnant women with a BMI of ≥ 25 KG/m2 (overweight) are also at risk of preterm birth, pre-eclampsia, gestational Diabetes Mellitus, and foetal macrosomia (Gondwe et al., 2018). Pregnant woman with a transvaginal sonographic cervical length also known as a short cervix of < 25mm are at risk of preterm labour in the mid-trimester of pregnancy (Counde-Agudelo & Romero, 2016).

2.3 Common Causes of Preterm Labour

The causes of preterm are multifactorial. However, among the sub-Saharan African population, preterm labour is caused by the following factors: HIV infection, maternal undernutrition, infrequent Antenatal Care attendance, not receiving intermittent preventive treatment against malaria and *Chorioamnionitis* (Naidoo, Sartorius & Tshimanga-Tshikala, 2016; Garciá-Basteiro et al. 2017). Delnord and Zeitlin (2019) outlined the causes of preterm birth as follows; previous preterm birth, hypertensive/vascular disorders, and diabetes. These common causes of preterm can be identified at the primary healthcare by the nurses and refer mothers to the other level of care at the nearest hospitals, as encouraged in the theory of Mercer (Basavanthappa, 2007).

Mullan and Hamilton (2016) said about 40%-45% of preterm birth is caused by preterm labour and 25%-40% of preterm births occur due to Preterm Premature Rupture of Membranes (PPROM). Whereby Onwughara, Moodley, Valashiya and Sebitloane (2020), stated that the common factors associated with PPROM are cervicovaginal infections leading to *Chorioamnionitis*, urinary tract infections, tobacco use, *placenta abruptio*, multiple gestations, cervical incompetence.

Moreover, Keelan and Newnham (2017) argue that 'spontaneous preterm labour' is caused by *placental malperfusion* in singleton pregnancies. Bénin, Blanc, Chollat, Jarreau, Goffinet, Tsatsaris and Delorme (2020) mentioned that PPROM, 'spontaneous preterm labour' with intact membranes, vaginal bleeding due to abnormal placental insertion as other causes of preterm labour. However, Delnord and Zeitlin (2019) said about half of the spontaneous preterm births that occurs following preterm labour and premature rupture of membranes their biological cause is unknown.

2.4 Preventative Measures of Preterm Labour

Appiah-Sakyi et al., (2017) said that the primary preventative measure is to enhance Antenatal Care. Identified alcohol abusers and smoking pregnant women are encouraged to quit as this are the predisposing factors of preterm labour in pregnant women from low socio-economic status. While other pregnant women with co-morbidities are referred to the hospitals to be managed by another multidisciplinary team (Appiah-Sakyi et al., (2017).

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Allotey, Matei, Husian, Newton, Dodds, Armson, Khan and Vogel (2018) also believe that intervention of preterm labour should be based on primary prevention level which includes smoking prevention campaigns, giving treatment with vitamin supplements and weight optimization. An early identification of high-risk women, cervical length screening, progesterone therapy, and by indicated history of preterm labour a transvaginal placement of cerclage is inserted to prevent subsequent preterm labour (Tyna, Mourad, Wright, Winter, Garza, Smith, Brink, Wei & Moawad, 2019; and Eleanor, Wade, Jennifer, Byers, Andrew & Thagard, 2020).

The secondary prevention of preterm labour is targeted on pregnant woman who are known to be at high risk of having preterm labour, the recommended treatment is a low dose of aspirin which has shown a reduction in preterm labour for women who are at risk of pre-eclampsia (Piso, Zechmeister-Koss & Winkler, 2014). Activity restriction is commonly prescribed to prevent preterm labour, which is at least 1 hour - 8hours of rest during the day or even continuous bed rest.

Antibiotic therapy was proposed as the intervention to prevent preterm labour among pregnant women who have recently been diagnosed with Preterm Premature Rupture of Membranes. *Arabian pessary* is currently introduced as an intervention to prevent preterm labour (Kara & Klebanoff, 2014). According to da Fonseca, Damião and Moreira (2020), the universal screening for short cervical length is one of the recommendations for mothers with short cervical length between 18-24 weeks of gestation.

The cervical length measured by transvaginal ultrasonography is an effective screening test for the prevention of preterm labour. However, according to da Fonseca, Damião and Moreira (2020), some international societies do not recommend routine cervical length screening. The American College of Obstetricians and Gynaecologist (ACOG) and Society for Maternal-Foetal Medicine (SMFM) recognises that such screening may be considered (da Fonseca, Damião & Moreira, 2020).

The indication for cervical cerclage in pregnant mothers depends on history, ultrasound, and physical examination (da Fonseca, Damião & Moreira, 2020). Boelig and Berghella (2017) further explain the indications of cervical cerclage placement

as a history of painless cervical dilation which lead to the second trimester loss. The ultrasound, which is done in the second trimester of pregnancy, reveals a cervical length of <25mm that is also known as a short cervix and the cervix that is dilated during pregnancy diagnosed by vaginal examination.

Cervical cerclage, known as a surgical procedure, to be performed on pregnant women with cervical incompetence is one of the initiatives that is used, whereby the suture is placed on the cervix to prevent painless cervical dilation before 37 weeks of gestation, which may result in preterm labour (Koullali, Westervelt, Myers & House, 2017). However, the pregnant mothers with evidence of *Chorioamnionitis*, active vaginal bleeding, ruptured membranes and the pregnant mothers who present with signs of preterm labour are contraindicated to cervical cerclage placement (Boelig & Berghella, 2017).

Moreover, placing a cerclage comes with the following risks, namely, PPROM, infections, preterm labour, suture displacement and per vaginal bleeding. According to a preliminary animal study conducted in New Zealand, there is another type of cerclage, which is made of a silk fibroin. This fibrous protein that was injected on white pregnant rabbits and the results came positive, no rabbit had preterm labour (Koullali, Westervelt, Myers & House, 2017).

In 1959 and 1961, Boelig and Berghella (2017) stated that the non-surgical procedure used to prevent preterm birth on pregnant women with a history of preterm labour and short cervical length was the placement of *arabin pessary* (Saccone, Ciardulli, Xodo, Dugoff, Ludmir, Pagani, Visentin & Gizzo, 2016). According to the study conducted in China in 2013 on pregnant mothers with singleton pregnancy and have pessary placement for prevention of spontaneous preterm births, the pessary did not find the positive effect on the prevention of preterm labour (Koullali et al., 2016).

Moreover, Koullali et al., (2016) reported that a Cochrane Review from 2014 concludes that there is no proof available that cervical cerclage placement in multiple pregnancy is the effective intervention in the prevention of spontaneous preterm birth. The other initiative used to prevent preterm birth is administration of a weekly dose of 250mg of intramuscular *17-alpha hydroxyprogesterone caproate* is recommended for women

with a history of previous singleton 'spontaneous preterm labour', it is given between 16 and 36 weeks of gestation (Zipora, Lauterbach, Matanes, Beloosesky, Weiner & Weissman, 2018; Newnham et al., 2014; Gupta & Roman, 2012; and Rundell & Panchal, 2017).

However, in the recent study that was conducted on the 29 October 2019, a US Food and Drug Administration advisory committee voted nine vs seven to withdraw interim approval of *17-alpha hydroxyprogesterone caproate* for preventing recurrent preterm birth (David, Nelson, Donald, McIntire, Kenneth & Leveno, 2021). Furthermore, the confirmatory trial, known as the prevention of preterm birth in women with a previous singleton spontaneous preterm delivery trial, was not confirmatory (David et al. 2021).

In a meta-analysis of 775 patients with cervical length of <25 mm treated with vaginal progesterone of variable doses (90 mg, 100 mg, 200 mg), there was a considerable reduction in spontaneous preterm births before 28, 33 and 35 weeks of gestation. However, in the multiple pregnancies and those complicated by Preterm Premature Rupture of Membranes, there is no evidence that progesterone is effective in preventing the spontaneous preterm delivery (Appiah-Sakyi, Shaikh & Abid, 2017).

Tocolysis is the administration of therapeutic agents to prevent preterm birth, in the case of threatened preterm birth due to the premature onset of uterine contractions (Paul & Smith, 2018). Moreover, Paul and Smith (2018) further divided *Tocolysis* into 'primary *Tocolysis'*, which refers to initial *Tocolysis* administered when a woman presents with preterm labour, and 'maintenance *Tocolysis'*, which refers to the *Tocolysis* given after the successful arrest of preterm labour with another primary agent.

However, Murray, Stock and Norman (2017); and Miyazaki, Garcia, Ota, Swa, Oladapo and Mori (2016) say that *Tocolysis* can be achieved by using beta-agonists, *Indomethacin, Atosiban* and *Ethanol*, which were associated with prolonged pregnancy for 24 hour or 48 hour and seven days, without the benefit of neonatal morbidity and mortality. In a systematic review and network analysis, a meta-analysis of *Tocolytic* agents, namely, *Nifedipine* and *Atosiban*, had same efficacy and site

effects but *Nifedipine* had lower costs (Murray et al., 2017; and Miyazaki et al., 2016).

Tocolysis does not reduce the rate of preterm births, but it may stop the uterine contractions within the first seven days of preterm labour, thus prolongation pregnancy for antenatal corticosteroid administration to improve foetal lung maturation and in-utero transfer to tertiary facilities for further management of the mother and the neonate. The commonly used drugs for '*tocolysis'* in the United Kingdom (UK) are *Nifedipine*, *Atosiban* and *indomethacin* (Appiah-Sakyi et al., 2017).

Even though *Nifedipine* is unlicensed it is the commonly used *Tocolytic* drug in the UK because of its advantages of cost, ease of administration and efficacy (Appiah-Sakyi et al., 2017). Although *Atosiban* drug has not been approved by the US Food and Drug Administration (FDA) on grounds of safety, but it is the only approved *tocolytic* treatment that is used extensively in the UK (Appiah-Sakyi et al., 2017). According to Appiah-Sakyi et al. (2017), *indomethacin* is a commonly used *tocolytic* drug with fewer maternal side effects in the UK and it is used as the first line treatment of tocolysis in the United States of America (USA) in pregnant woman with less than 32 weeks of gestation. *Nifedipine* becomes the *tocolytic* drug of choice from 32 to 34 week in USA.

However, *Nifedipine* regimen is also recommended as the first line treatment of tocolysis in the *Guidelines for Maternity Care in South Africa* (2015) and *indomethacin* as a second line of treatment. The researcher has observed that *Nifedipine* regimen is used in the facility where the researcher is employed as recommended in the *Guidelines for Maternity Care in South Africa* (2015) currently.

The other strategies for maternal intervention to be done is to improve the health outcome of the preterm neonate include covering antenatal *Corticosteroids*, *Tocolysis*, *Magnesium Sulphate*, antibiotic prophylaxis (WHO, 2015). In all initiatives mentioned in the study, there is no recent published contextual statistics that proofs that there is a reduction in preterm birth, comparing with previous years. However, preterm birth remains to be the leading admitting diagnoses in the previous six months in the Neonatal Ward of the Mankweng Hospital (Mankweng Hospital Statistics, 2019).

The interventions mentioned above which are performed by the obstetrical nurses and obstetricians at the selected hospitals will help to treat the predisposing factors of preterm labour and improve the outcome of the neonates that was delivered prematurely. The theory of Mercer explains these through the concept of nursing and health (Basavanthappa, 2007)

2.5 Conclusion

Chapter 2 discussed literature review which involves introduction, predisposing factors of preterm labour, common causes of preterm labour and preventative measures of preterm labour. Chapter 3 discusses the research methodology used for the study

CHAPTER 3
RESEARCH METHODOLOGY

3.1 Introduction

The previous chapter discussed the literature review, this chapter focuses on the research method and design that were used to conduct this research. The study was guided by Mercer's Theory of Maternal Role Attainment. A sequential explanatory mixed method was used in this study. The overview of research methodology includes the research setting, research design, population and sampling, data collection and analysis, reliability and validity, measures to ensure trustworthiness and ethical consideration.

3.2 Mixed Method Research

The mixed methods research was used in the study. According to Creswell (2014), the explanatory sequential mixed method means that data collection and analysis of quantitative strand is followed by data collection and analysis of qualitative strand results. This approach is suitable as the researcher intended to develop strategies to enhance the prevention of preterm labour because data were collected from pregnant woman with a history of preterm labour; mothers who delivered premature neonates; and analyse quantitative research results.

The researcher began with quantitative strand 1 due to reasons that its result can be puzzling and difficult to interpret, the qualitative research results will help to explain them better. Both quantitative and qualitative approaches were used to conduct research in the selected hospitals in the Capricorn District, Limpopo Province.

1st Strand

Quantitative

Questionnaires for midwives & mothers

Midwives 139 women 95

SPSS

2nd Strand

Qualitative data is used to enrich and contextualise

Interviews: midwives, mothers and obstetricians

Explorative, descriptive

Tesch's method

Literature review

Integration of results

Triangulation of data. (Using qualitative data to contextualise the quantitative findings).

Integration and interpretation of findings

Conclusions

Development of Strategies

Enhancement of preterm labour

Recommendations

Figure 3.1: Schematic Sequential Explanatory Mixed Method Research and Triangulation

Figure 3.1 depicts the Schematic Sequential Explanatory Mixed Method Research and Triangulation. Both strands have equal weight. However, it will start with QUANTI and followed by QUALI (Creswell, 2013).

3.2.1 Research Setting

The study was conducted at Seshego, Mankweng and Pietersburg Hospitals. Seshego Hospital is a level 1 hospital situated in Seshego Zone 1 at the corner of Bo-Okelo Street and Nelson Mandela Drive, nearby main roads are R567 to the North-East of the hospital as well as the R521 to the East. Seshego is in the Western part of Polokwane. The Mankweng Hospital is a level 3 hospital that is situated in the Capricorn District, Limpopo Province in South Africa, along R71 road and it is approximately 30KM away from Polokwane town.

Pietersburg hospital is a level 3 hospital in the Capricorn District, Limpopo Province in South Africa. The hospital is about 3.8km away from Thabo Mbeki Street, in Polokwane town and it is situated at corner Hospital and Dorp Streets. The hospitals serve communities and pregnant women staying in Limpopo Province. The study was conducted in maternity units of the selected hospital. Maternal and neonatal care services are rendered at the selected hospitals which are Mokopane Hospital, Mankweng Hospital and Pietersburg Hospital in Limpopo Province.
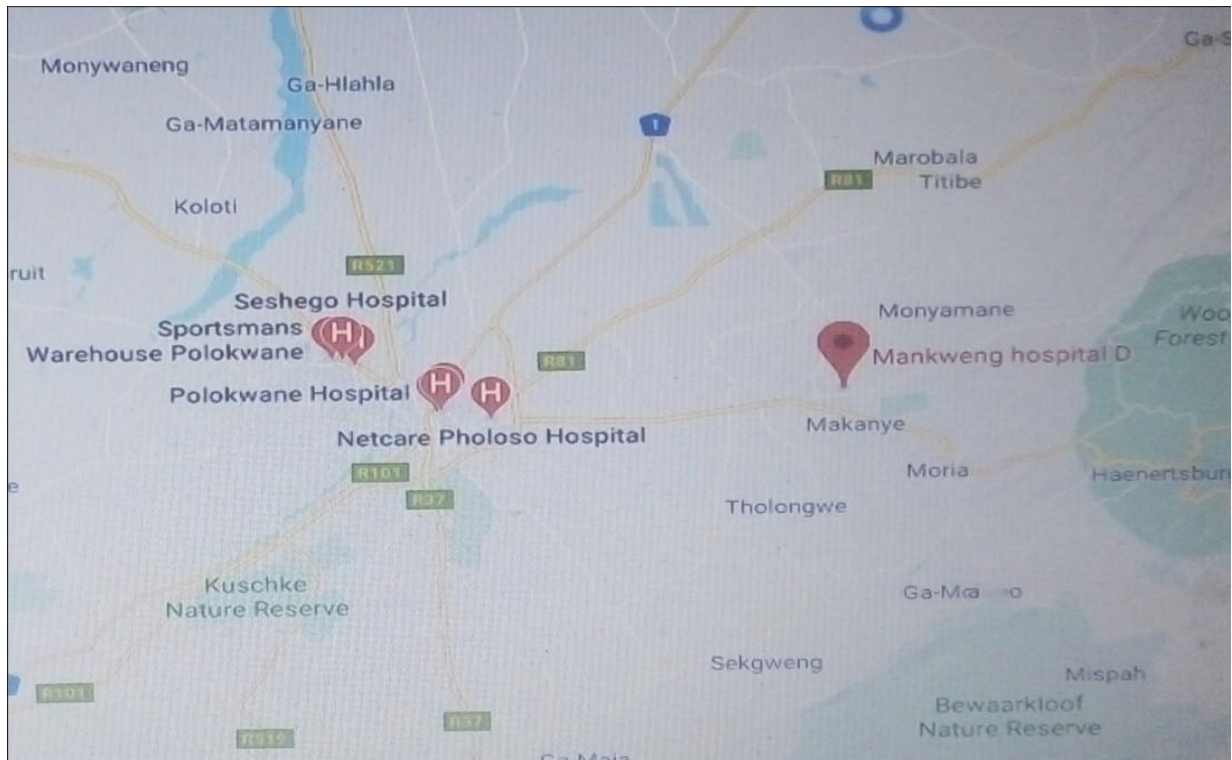
Figure 3.2: A Map of the Selected Hospitals

Figure 3.1 shows a map of selected hospitals where data were collected for the research study. The hospitals are situated in the Capricorn District of Limpopo Province, and they include Mankweng, Pietersburg/Polokwane and Seshego Hospitals (Google Maps, 2019).

3.2.2 Research Design

Research design involves a set of decisions regarding what topic to be studied among what population with what research methods for what purpose (De Vos, Strydom, Fouchè & Delport, 2011). Therefore, the suitable research design is sequential explanatory design whereby the researcher first conducts quantitative research, analyse the results, and builds on the results to explain them more in qualitative research (Creswell, 2014). The research design was assumed to give most definite answers about the research question as the researcher believed that it is an appropriate design to deal with the research topic.

The high- risk clinic, Postnatal Unit, Mother Lodger Unit and Kangaroo Mother Care Unit, Antenatal Unit and Labour Unit in the selected hospitals in Capricorn district, Limpopo Province are the designated research settings. The study was

conducted in the SANC accredited institutions, the designated research settings render services for pregnant mothers. The midwives and obstetricians who participated in the study are the employee at the selected hospitals. The mothers, midwives and obstetricians who participated in the study reside in Mankweng local areas, Polokwane local areas, Seshego local areas. Furthermore, other mothers who participated in the study are from peripheral hospitals.

3.3 First strand: Quantitative design

The sequential explanatory design was opted by the researcher ,the design enables the researcher to first conducts quantitative research, analyse the results and builds on the results to explain them more in qualitative research (Creswell, 2014).The first strand of the study was used to identify factors that hinder the prevention of preterm labour, explore the knowledge and practice of midwives and obstetricians in preventing preterm labour in Seshego, Mankweng and Pietersburg Hospitals in the Capricorn District, Limpopo Province.

3.3.1 Population and Sampling

3.3.1.1 Population

According to Brink, Van der Walt, and Van Rensburg (2012), 'population' is a complete set of persons or objects who possess common characteristics that is of interest of the researcher. In this first strand of the study, population was a subset of pregnant women with a history of preterm labour and mothers who recently delivered premature neonates who were 77 in number and a subset of midwives who were 62 in number at the selected hospitals in the Capricorn District, Limpopo Province. The number of mothers was obtained from the unit registers and the number of midwives was obtained from the monthly unit allocation of midwives in the selected hospitals.

3.3.1.2 Sampling

According to LoBiondo-Wood and Haber (2018), sampling is a process of selecting representative units of population for a study. Brink et al., (2012) describes Purposive/Judgmental Sampling as the technique that is based on the judgement of the researcher regarding participants or representative of the study

phenomena or who are especially knowledgeable about the question at hand.

In the study, Purposive/Judgemental Sampling was used to select pregnant women with a history of preterm labour who were attending high-risk clinic during the time of study. The researcher approached the nurse in charge of the selected hospital upon the data collection days, who then granted the researcher a permission to enter the units and collect data.

The researcher requested permission again from the midwives to check the Daily Maternity Clinic Register for easy identification and selection of participants with a history of preterm labour who were on duty and kindly requested them one by one to participate in the study while they are waiting for consultation during the antenatal clinic day (high-risk clinic day). The verbal and written consent was then obtained by the researcher from the participants to participate in the study.

The researcher requested to check the admission book of mothers who are admitted in the selected units from the midwives who were on duty for easy identification and selection of the participants based on their diagnosis. Mothers who gave birth to premature neonates who were admitted in the Postnatal Unit, Mother Lodger Unit and Kangaroo Mother Care Unit during the period of the study and midwives had an equal chance of participating in the study. The researcher then approached the mothers in a cubicle, the cubicle has about eight mothers. The researcher told the mothers about the research topic in groups and mothers who were interested in participating raised their hands and the researcher asked them to follow her to the private room to start with data collection. The verbal and written consent was obtained by the researcher from the participants to participate in the study. All midwives who were on duty during the time of the study were approached and requested to participate in the study.

3.3.2 Sample Size

All pregnant women with a history of previous preterm labour who were attending high-risk clinic and all mothers who delivered premature neonates who were admitted in Postnatal Unit, Mother Lodger Unit and Kangaroo Mother Care Unit were requested to participate in the study and all registered midwives who were on duty during the

period of study in Selected hospitals.

The sample size was calculated using the Slovin's formula (Simamora, 2004). The Slovin's formula makes it possible to sample the population with a desired degree of accuracy. It gives the researcher an idea of how large the sample size needs to be, to ensure a reasonable accuracy of results (Ellen, 2017).

   n - Sample size, N- estimated population size and e- error of margin.

Sample size of estimated number of pregnant women with a history of preterm labour who were attending high-risk clinic, mothers who delivered premature neonates admitted in Postnatal Unit, Mother Lodger Unit and Kangaroo Mother Care cubicle at selected hospitals.

The total estimated number of pregnant women with a history of preterm labour in hospital C was 17, hospital A was 65 and hospital C was
13. The total estimated number of midwives in hospital A was 25, hospital B was 20 and hospital C was 28. The estimated population size is obtained from the midwives who work in the maternity section of the selected hospitals.

❖ The Slovin's formula is calculated as follows for mothers

: $$n = \frac{N}{1 + Ne^2}$$

   n= Sample size

   N= Population size= 95

   e= Confidence level= Standard confidence level is 95%

   for a better accuracy, which will give a margin error of 0.05

❖ A computer of the confidence level

   e= 100%-95%

   e=5%=0.05

❖ Sample size

$$nn = \frac{95}{1 + 95(0.05)^2}$$

$$n = \frac{95}{1 + 95(0.0025)}$$

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$$nn = \frac{95}{1.2375}$$

$$nn = 77$$

Sample size of estimated registered midwives at Labour Ward and Antenatal Ward in Selected hospitals was obtained from monthly allocation of staff in the Labour and Antenatal Wards, with the assistance of the midwives who work in the selected hospital.

❖ The Slovin's formula is calculated as follows for midwives

:
$$n = \frac{N}{1 + Ne^2}$$

n= Sample size

N= Population size= 95

e= Confidence level= Standard confidence level is 95%

for a better accuracy, which will give a margin error of 0.05

❖ A computer of the confidence level

e= 100%-95%

e=5%=0.05

❖ Sample size

$$nn = \frac{73}{1 + 73(0.05)^2}$$

$$nn = \frac{73}{1 + 73(0.0025)}$$

$$nn = \frac{73}{1.1825}$$

$$nn = 62$$

3.4 Inclusive and Exclusive Criteria

3.4.2.1 Inclusive Criteria

- All pregnant women between 12 and 45 years with a history of preterm labour who were attending high- risk clinic, all mothers between the 12 and 45 years who delivered premature neonates age and willing to sign a consent indicating their willingness to participate.

3.4.2.2 Exclusion Criteria

All pregnant women with a history of preterm labour who were attending high-risk clinic and all mothers who delivered preterm neonates who.

- Are intellectually impaired,
- Cannot speak/read/write English or Sepedi,
- Are admitted at high care wards were not part of the participants because they did not know what is expected from them and what to do.

3.5 Pilot Study

The pre-test included experts in the field of study who are knowledgeable regarding questionnaire construction. The questionnaire was evaluated for Content Validity and Face Validity by experts. The pilot study was conducted from 4 April 2020 to 8 April 2020 at hospital C after receiving an approval letter on the 19 March 2020 to collect data in the institution. The researcher distributed 10 questionnaires to the mothers who were admitted in KMC and Antenatal Unit in the hospital during the time of study and to the 10 midwives who were on duty during at the time of study.

The questionnaires were given to the mothers and midwives in a private room to complete them. The researcher used the alcohol hand-based sanitiser before giving the respondents the questioner and after receiving the questioner from the respondents, social distance was observed. The questioners were completed individually in a private room, respondents and the researcher were wearing masks and the alcohol hand-based sanitiser was used prior and after completing the questioner by the respondents. All questionnaires were completed and returned.

A pilot study was performed to:
- Determine the clarity of questions.
- Correct ambiguous instructions and wording.
- Improve the effectiveness and success of the instrument; and
- Determine the completeness of the response sets and the time required to complete the questionnaire and to test the data-gathering techniques (Botma et al., 2010).

3.6 Pilot Study Results

All questionnaires were coded and analysed, some of the respondents did not

complete all the questions because some option of answer less, incorrect numbering on questions and it had many open-ended questions. The pilot study was conducted from 10 mothers and 10 midwives who did not form the part of the main study. All 10 midwives were females. Through the pilot study the researcher was able to restructure the questionnaires. The pilot study results are kept locked by the researcher. The questionnaire was later improved by the supervisor and added with some more options for respondents to tick at, the numbering was corrected and reduced the open-ended questions. The researcher used her own finances to print out the questionnaires and travel to the study sites to collect data.

3.7 Data Collection

Data were collected using an adapted questionnaire by the researcher from several articles written by Boutin, Guerby, Gasse, Tapp and Bujold (2021); Carrie et al., (2016); and Rundell and Panchal (2017), and through an in-depth literature review searched from Biomed central, BMJ group, Science Direct databases. The adapted questionnaire was presented to the supervisor and the statistician, and it was accepted in terms of Face and Content Validity.

- **Preparation of data collection**

Prior data collection, the researcher met with the hospital's HRD Manager, Audit Nurse, Unit Managers of the selected units in Mankweng Hospital, from where data were collected; the Public Health Specialist, Nurse Manager, Unit Managers in Pietersburg and the Nurse Manager and Unit Managers of the selected units Seshego Hospitals to present the documents and permission to conduct the study following submission of the researcher's research proposal and telephone calls.

During the meeting the parties discussed the research topic, the entire aspects of the study and their institution might benefit from the study. Furthermore, the researcher was advised to ensure that data collection does not interfere with the planned patient care and other activities of the mothers and the neonates. The issue was referred to the hospital research committees and the Nurse Managers of selected units and the approval collect was granted.

The researcher was advised to collect data on weekends, during holidays and after

hours because the researcher works office hours. Orientation and introduction of the researcher to the selected units was done so that when the researcher comes on selected days and times the unit staff allow the researcher to collect data.

- **Procedure for Data Collection**

The researcher went to different selected hospitals for 77 mothers and 62 midwives to complete the questionnaires who were willing to participate in the study after explanation and gave them informed consent to complete the questionnaires and participate in the study. Data were collected from a subset group of pregnant women with a history of preterm labour who were attending high-risk clinic and midwives who work in labour and antenatal unit at the selected hospitals. Data were collected from mothers who delivered premature neonates who were admitted in Postnatal Unit, Kangaroo Mother Care cubicle and midwives. The process took place at the selected hospitals in a private room which were free from noise and disturbance and the researcher requested verbal and written before the study commence.

The questionnaire for pregnant women and mothers who delivered preterm neonates was written in English and Sepedi comprising 5 sections. The sections include the following, demographic data comprises 6 questions, accessibility comprises 3 questions, obstetric data comprises 23 questions, lifestyle comprises 8 questions and knowledge comprise 10 questions. (See Appendix F1.)

Table 3.1 Scheduled Dates for the Main Study

Name of the hospital	Date of approval from the hospital	Dates data collected
Hospital A	13 March 2020	10 April – 31 July 2020
Hospital B	29 July 2020	12 –26 September 2020
Hospital C	19 March 2020	17 April– 30 May 2020

Table 3.1 shows the dates of approval letters received from the selected hospital and the dates of when quantitative data were collected. The main study was started from 10 April 2020 to 31 July 2020 in hospital A, 49 questionnaires were given to the mothers who were admitted in hospital A in Antenatal Unit, Postnatal Unit, Kangaroo Mother Care Unit and who came for high-risk clinic in hospital on various days. About 25 questionnaires were given to the midwives who were on duty in Antenatal Unit and Labour Unit, during the time of study in hospital A.

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From 17 April 2020 to 30 May 2020, the researcher distributed about 10 questionnaires to the mothers who were admitted in Kangaroo Mother Care Unit and Antenatal Unit and 18 questionnaires to the midwives who were on duty in Antenatal Unit and Labour Unit, during the time study to complete the questionnaires in hospital C.

In the hospital B, the researcher started to collect data from 12 September 2020 to 26 September 2020, the researcher distributed 18 questionnaires to the mothers who were admitted in Antenatal Unit and Postnatal Unit and 19 questionnaires of the midwives who were in Antenatal Unit, Labour Ward, and Postnatal Unit during the time of study. All questionnaires were returned and fully completed. The duration of completion of questionnaires was 35-45 minutes and all questionnaires were fully completed and returned to the researcher.

3.8 Data Analysis

Data were captured on Microsoft Office Excel 2010 by the researcher. Data analysis was done by using Statistical Package for Social Sciences (SPSS) version 25, with the help of the statistician. SPSS is a computer program used widely for handling numerical data. Data presentation is done by using frequencies, tables, and percentages in the form of graphs. Statistical analysis was done to assist the researcher to develop the strategies to enhance prevention of preterm labour in the selected hospitals in the Capricorn District, Limpopo Province. For statistical test, the researcher consulted with the university statistician within the university who assisted with calculation of sample size. A p-value of less than 0.05 is considered statistically significant.

3.9 Reliability and Validity

3.9.1 Reliability

Reliability refers to the degree to which the instrument can be depended upon to yield consistent results if used repeatedly over time on the same person or if used by two researchers (Brink, Van der Walt & Van Rensburg, 2014). Equivalence reliability will help in the study to determine if similar questionnaires given at the same time will produce the same or different results given to the same population of the study.

Equivalence reliability was ensured by conducting a pilot study, which is a preliminary study done to establish Content Validity of scores of the instrument used and to improve questions, format, and scale prior to performance of the actual study (Creswell, 2014). Pilot study was conducted on 10 mothers who were admitted in hospital C in KMC room and Antenatal Unit which were not part of the actual study. The self-developed questionnaires were given to the respondents in a private room at Seshego Hospital, to respond to the questions.

The interviews were also conducted on the same respondents in the private rooms at hospital C. Pilot study was done on 6 midwives who works in Antenatal Unit and Labour Unit in hospital C, whereby the self-developed questioners were given to the midwives in a private room to respond to the questions and interviews were also conducted on the midwives. All questionnaires were completed and returned. Through the pilot study, the researcher was able to restructure the self-developed questionnaires and refine some of her probing interview questions.

3.9.2 Validity

Validity refers to whether an instrument measures what it claims to (Newell & Burnard, 2006; and Brink et al., 2012). In this study, the researcher ensured validity by doing a thorough literature review, to identify the factors that hinder the prevention of preterm labour and explore the knowledge and practice of midwives and obstetricians in preventing preterm labour. These helped the researcher to develop strategies to enhance prevention of preterm labour. The questionnaires' Content Validity, Face Validity and External Validity were tested.

- *Content Validity*

Content Validity refers to the degree to which an instrument covers the scope and range of information that is sought (Brink et al*.,* 2012). The researcher gave the supervisor an instrument to evaluate the Content Validity of the instrument and conducted a pilot study which assisted the researcher to restructure the questionnaire to cover the scope and range of information required for the study.

- *Face Validity*

Face Validity refers to the ability of the instrument to measure what it is supposed to measure. All questions in the instrument focus on the possible causes of preterm labour, predisposing factors, and the prevention of preterm labour in selected hospitals. The researcher gave the supervisor the instrument to evaluate if the instrument measured what it is supposed to measure. Therefore, the instrument was considered to meet the requirements of Face Validity.

- *External Validity*

External Validity refers to the degree to which the study results can be generalised to other people and other research settings (Brink et al., 2012). In this study, the researcher has provided a detailed database for other researchers to determine whether the study is applicable in other settings.

- *Criterion-Related Validity*

Criterion-Related Validity refers to a pragmatic approach to establishing the relationship between scores and the instrument in a question and other external criterion (Brink et al*.,* 2012). In this study, the researcher tested if the instrument measure what it is expected to measure by comparing the instrument that was used in the pilot study and known to be valid with the instrument that was used for the actual study.

3.10 Second Strand: Qualitative

The second strand of the study includes data collection and analysis of qualitative results. This approach is suitable as the researcher intended to explore the knowledge, practise of obstetricians and to develop the strategies to enhance the prevention of preterm labour in the selected hospitals in the Capricorn District, Limpopo Province.

3.10.1 Population and Sampling

3.10.1.1 Population

According to Brink et al. (2012), a 'population' is a complete set of persons or objects who possess common characteristics that is of interest of the researcher. In this study, population is the 77 pregnant women with a history of preterm labour and mothers

who recently delivered premature neonates; 62 of midwives; and 10 obstetricians from the selected hospitals in the Capricorn District, Limpopo Province.

3.10.1.2   Sampling

According to Brink et al. (2012) sampling is a subset of the population selected to represent the population. Two types of Non-Random Sampling were used in the study, which were, namely, Convenience Sampling and Purposive/Judgemental Sampling because the researcher collected data on pregnant women with a history of preterm labour and mothers who had recently delivered premature neonates; and midwives and obstetricians who were available during the study period at the selected hospital.

3.11 Pilot study

The pre-test included experts in the field of study who are knowledgeable regarding Interview Guide construction. The Interview Guides were evaluated for Content Validity and Face Validity by experts. The pilot study was conducted from 4 April 2020 to 8 April 2020 at hospital C after receiving an approval letter on the 19th of March 2020 to collect data in the institution. The researcher conducted interviews on 5 mothers who were admitted in KMC and Antenatal Unit in the hospital during the time of study, 5 midwives, and 3 obstetricians who were on duty during at the time of study. These participants did not form part of the main the study.

Through the pilot study the researcher was able to rephrase the questions on the Interview Guide for mothers. The Interview Guide for midwives and obstetrician was not rephrased nor edited. The researcher used her own finances to print out the Interview Guide and travel to the study sites to collect data.

A pilot study was performed to:

- Determine the clarity of questions;
- Correct ambiguous instructions and wording;
- Improve the effectiveness and success of the instrument; and
- Determine the completeness of the response sets and the time required to complete the questionnaire and to test the data-gathering techniques (Botma, Greeff, Mulaudzi & Wright, 2010).

3.12 Pilot Study Results

Most of the mothers did not understand the concept 'preterm labour' during the interview. When the researcher explained to them in their own language, they understood and were able to respond to the questions during the interview. However, midwives and obstetricians were able to understand the questions asked and responded appropriately. The researcher used the same interview guide to collect data.

The interviewer asked these central questions: For pregnant women and mothers who delivered premature neonates is "Please, can you explain in your own words what preterm labour is and what can be done to prevent it" (see Appendix G1, the interview guide for mothers). The second central question for midwives is "Please can you describe, what could be the common contributory cause of preterm labour that the pregnant women in your institution present with" (see Appendix G2, the interview guide for midwives).

The third central question for obstetricians is "Please share with me your thoughts about what can be the possible cause that contribute to the continuous occurrence of preterm labour because there are guidelines in place stating clearly how preterm labour can be prevented" (see Appendix G3, the interview guide for the obstetricians). The central question asked was followed by several probing questions which need to be covered (see Appendix G3, the interview guide for the obstetricians). Clarity seeking questions were also asked so that the participants would be given an opportunity to explain areas which are not clear to the researcher.

A voice recorder was utilised to capture all interview sessions and field notes were written to capture some of the important aspects of the interview which cannot be picked up by the voice recorder like physical expressions. The interview lasted for about 30-45 minutes with each participant, until data saturation was reached. The collection of data took 1-month period, and it was conducted in a private room that was free from noise and disturbance.

3.13 Data Collection

Data collection is the gathering of information that describes some information from which conclusions can be drawn during the research project (Brink et al., 2012). Individual interviews were conducted using a self-developed Interview Guide (see Appendix G1 for mothers, Appendix G2 for midwives and Appendix G3 for the obstetricians). The self-developed Interview Guide for mothers, midwives and obstetricians was presented to the supervisor and the statistician and it was accepted.

- **Preparation of data collection**

Prior data collection, the researcher met with the hospital's HRD Manager, Audit Nurse, Unit Managers of the selected units at hospital A where data were to be collected, the Public Health Specialist, Nurse Manager, Unit Managers in hospital B and the Nurse Manager and Unit Managers of the selected units at hospital C to present the documents and permission to conduct the study following submission of the researcher's research proposal and telephone calls.

During the meeting, the parties discussed the research topic, the entire aspects of the study and their institution might benefit from the study. Furthermore, the researcher was advised to ensure that data collection does not interfere with the planned patient care and other activities of the mothers and the neonates. The issue was referred to the hospital research committees and the Nurse Managers of selected units and the approval collect was granted.

The researcher was advised to collect data on weekends, during holidays and after hours because the researcher works office hours. Orientation and introduction of the researcher to the selected units was done so that when the researcher comes on selected days and times the unit staff allow the researcher to collect data.

- **Procedure for Data Collection**

The researcher went to different selected hospitals to conduct interviews on all mothers, midwives and obstetricians who were willing to participate in the study after explanation and gave informed consent to participate in the study. Data were collected from a subset group of pregnant women with a history of preterm labour who were attending high-risk clinic.

Data were collected from mothers who delivered premature neonates who were admitted in Postnatal Unit, Kangaroo Mother Care cubicle, midwives, and obstetricians. The interviews were conducted at the selected hospitals in a private room which were free from noise and disturbance and the researcher requested verbal and written before the interview commence. The researcher did not request the names of the participants during the interview and a verbal and written consent were obtained. Social distance was observed during the interview, the alcohol-based hand sanitiser was used throughout the interview by the participant and the researcher. The researcher and the participants were wearing masks.

The Interview Guide for mothers comprised of four questions (see Appendix G1), the Interview Guide for midwives comprised of four questions (see Appendix G2) and the Interview Guide for obstetricians comprised of five questions (see Appendix G3). All the Interview Guide questions were followed by probing questions.

Table 3.2 Scheduled Dates for the Main Study

Name of the Hospital	Date of approval from the hospital	Dates data collected
Hospital A	13 March 2020	10 April 2020 – 31 July 2020
Hospital B	29 July 2020	12 -26 September 2020
Hospital C	19 March 2020	17 April 2020 – 30 May 2020

Table 3.2 shows the dates of approval from the selected hospital and the dates of when qualitative data were collected. The main study was started from 10 April to 31 July 2020 in the hospital A, nine interviews were conducted from nine mothers who were admitted in the hospital in Antenatal Unit, Postnatal Unit, Kangaroo Mother Care Unit and who came for high-risk clinic in hospital on various days.

Three interviews were conducted two midwives who were on duty in Antenatal Unit and Labour Unit, during the time of study in hospital A. Three interviews were conducted with obstetricians who were on duty the time of study at hospital A.

In hospital B the researcher started to collect data from 12 to 26 September 2020, the researcher conducted four interviews with the mothers who were admitted in Antenatal Unit and Postnatal Unit and two interviews were conducted with the

midwives who were in Antenatal Unit and labour ward during the time of study.

From 17 April 2020 to 30 May 2020, the researcher conducted seven interviews with the mothers who were admitted in Kangaroo Mother Care Unit and Antenatal Unit and two midwives who were on duty in Antenatal Unit and Labour Unit, during the time of study in hospital C. Only one interview was conducted with an obstetrician who was on duty at hospital C during the time of data collection.

3.14 Data Analysis

Data analysis in qualitative research is non- numerical and usually in the form of written words or field notes and audiotapes. It involves an examination of the text (Brink et. al., 2012). Tesch's Open Coding data analysis method was used in this study. Creswell (2009) suggest the blending of the general steps of data analysis with the specific research strategy steps. The method has a linear, hierarchical, interactive approach, building from the bottom to the top.

- The researcher started by listening to the audiotapes and transcribe the information verbatim and read all the transcripts and the field notes thoroughly to obtain a general sense of data and wrote down the notes of some ideas as they come to mind when reading.
- The researcher selected one short interview and went through it trying to understand the underlying meaning, asking: What is this about?
- After going through all the transcripts, the researcher compiles a list of all similar topics and cluster them together in groups by forming columns that are then arranged into major topics, unique topics, and leftovers.
- The researcher gave codes to all the labelled topics, write codes next to the appropriate segment of the text data and observed the organisation of data to check if new codes have emerged.
- The researcher came up with a descriptive word for the emerged topics, by grouping topics that are related to each other and turn them into category and sub-categories.
- Data material belonging to each category was put together and preliminary analysis was performed by the researcher. After preliminary analysis, the

researcher submitted data to the independent coder who is an expert in qualitative research.

- The final decision on the abbreviation for each category was made and alphabetized the codes.

- When coding with the independent coder is complete, the contents of each category was summarized. The categories and sub-categories were discussed at length.

3.15 Measures to Ensure Trustworthiness

Trustworthiness refers to the degree of confidence qualitative researchers have in their data, assessed using the criteria of credibility, confirmability, dependability transferability (Polit & Beck, 2012).

- **Credibility**

Credibility determines whether the researcher has established confidence in the truth of the findings with the participants and the context in which the study was undertaken (Botman et al., 2010). Credibility was obtained from discovering human experiences as lived and perceived by the obstetricians in preventing preterm labour. In this study credibility was ensured by, staying in the field until data saturation was reached, to gain an in depth understanding by exploring the knowledge and practise of obstetricians regarding prevention of preterm labour in a form of asking probing questions.

- **Confirmability**

Confirmability refers to freedom from bias during the research process and results description (Botman et al., 2010). During data collection the data reflected the voice of the participant and the researcher's perception were put aside to ensure conformability. This was achieved by giving the external reviewer, data collected to audit it.

- **Dependability**

Dependability refers to the provision of evidence such that if it were to be repeated with the same or similar participants in the same context, its findings would be similar (Brink et al., 2012). Dependability was ensured by describing how the researcher

collected data, the type of data collected and gave a dense and thick description of the methodology used.

- **Transferability**

Transferability refers to the ability to apply the findings in other contexts or other participants (Brink et al., 2012). In this study, participants were sampled until data saturation is reached and gave a thick or dense description of data collected.

3.16 Bias

'Bias' is a form of systematic error that can affect scientific investigations and distort the measurement process (Krishna, Maithreyi & Surapaneni, 2010). The researcher delivered the questionnaires to the respondents and detach for the respondents to respond honestly without any fear and being probed by the researcher when answering the questionnaire. The researcher tried not to influence the respondents when they were answering the questions in the questionnaire. However, the researcher was around to help with clarity that might be needed on questions that are not clear to the respondents. For statistical bias, the researcher consulted the statistician within the university who assisted with sample calculation.

3.17 Ethical Considerations

The ethical standards were adhered to throughout the research.

- **Ethical clearance**

The research presented the proposal to the School of Nursing Science, and it was approved on the 23 April 2019 by the intra-Department and the research proposal was reviewed by the School Research and Ethics Committee on the 18 July 2019. The research proposal was submitted to the Faculty of Health Sciences for approval before submitting the research proposal to the Turfloop Research Ethics Committee and the approval letter was granted on the 9 October 2019 (see Appendix A, the approval letter from the Faculty of Health Sciences). The research proposal was also submitted to the Turfloop Research Ethics Committee (TREC) for the approval of research ethical clearance before commencing with the study, the research proposal was approved on the 5 November 2019 (see Appendix B, the approval letter from the

Turfloop Research Ethics Committee).

- **Permission**

Permission for collecting data at the health facilities was requested from the Department of Health Research Committee of Limpopo Province and the permission was granted on the 10 February 2020 (see Appendix C). The permission to collect data was also requested from the Chief Executive Officer (CEO) of the selected hospitals and permission in Mankweng Hospital was granted on the 13 March 2020 (see Appendix D1), at Pietersburg Hospital was granted on the 29 July 2020 (see Appendix D3) and at Seshego Hospital it was granted on the 19 March 2020 (see Appendix D2).

- **Informed consent**

This implies that participants have the rights to decide either to participate in this study or not to participate without penalty (Brink et al., 2012). Written informed consent was obtained voluntarily from each participant after the participants had been adequately given an outline of risks and benefits involved in the research project and before commencement of the interview sessions. A Consent Form was provided for the respondents to sign (see Appendix V), respondents chose not to be part of the study anytime and could withdraw from participating.

- **Autonomy**

The principle of autonomy was upheld to those participants who wished to withdraw, they were able to do so at any stage of data collection. Participant were given assurance that they might withdraw at any stage, and that they would not be coerced to continue without any prejudice, and they would not be disadvantaged in any way by the researcher or the outcome of the study (Burns & Grove, 2012).

- **Confidentiality and Privacy**

To ensure confidentiality, participants were informed that the information that they provide during the interview sessions will not be revealed (Brink et al., 2012). The researcher will not divulge the information about the collected data to any irrelevant third party. Privacy is the freedom people must determine the time, extent, and

general circumstances under which their private information will be shared or withheld from others (Burns & Grove, 2012). In this study, privacy was ensured by providing the respondents individually with questionnaires to complete, in a separate room free from disturbance and the interviews were conducted in the separate room free from disturbance.

- **Anonymity**

No participants' names are used (Brink et al. 2012) to ensure anonymity. Anonymity was ensured by writing only the numbers of the respondents on the questionnaires and that participant's name not mentioned on the voice records. Nothing was included that might have been insensitive to all known cultural and beliefs. Anonymity of respondents was protected by making it impossible to link the information to a specific individual. Transcripts and audiotapes will be kept locked for 5 years after completion of the study.

- **Harm**

Harm refers to any physical, psychological, social, or emotional discomfort of the respondents inflicted by the researcher during the research process. This study had minimal risks of harm to the respondents. The researcher ensured that the respondents were not harmed in any way through obtaining informed consent from the respondents, ensuring, and protecting anonymity and confidentiality of the respondents and providing the participants with the right to withdraw from the research at any time (Pilot & Beck, 2012).

3.18 Conclusion

This chapter discussed the research methodology and designs in details. Ethical considerations were observed and adhered to throughout the study and respondent's names remained anonymous.

CHAPTER 4
PRESENTATION AND DISCUSSION OF QUANTITATIVE RESULTS

4.1 Introduction

The previous chapter discussed the research methodology used to collect data from mothers, midwives and obstetricians at the Mankweng Hospital, Pietersburg Hospital and Seshego Hospital. This chapter discusses the results of data collected from the mothers and midwives. The results are presented in figures, tables, and narration for easier understanding by the reader. Data collected were analysed using the SPSS version 25 with the help of the statistician. Descriptive statistics such as frequencies, percentages were used to analyse the data.

4.2 Presentation of Quantitative Results

The section presents the results from the mothers and midwives. The presentation of the results from the mothers is the point of departure for this section. Data collected were presented with the aid of narratives, tables, and figures. The presented results are of data that were collected from the Mankweng Hospital, Pietersburg Hospital and Seshego Hospital.

4.2.1 Presentation of Quantitative Results from the Mothers and Midwives

The presentation of the results from the mothers and midwives consists of five sections: Section A, Section B, Section C, Section D and Section E. The following section presents results from Section A.

Section A: Socio-Demographic data

Socio-Demographic data included the following items, namely: age of mothers and midwives; gender for midwives; marital status for mothers; residential area for mothers; educational level for mothers; employment status for mothers; nursing qualification for midwives; speciality qualification for midwives; work experience of midwives; current ward allocated of midwives; and financial support of mothers.

Table 4.1 Age of Mothers and Midwives

Mothers			Midwives		
Age	n	%	Age	n	%
12-18 yrs.	8	10%	20-26 yrs.	6	10%
19-25 yrs.	24	31%	27-33 yrs.	19	31 %
26-31 yrs.	25	32%	34-40 yrs.	16	26%
32-38 yrs.	17	22%	41-47 yrs.	9	14%
39-45 yrs.	3	5%	48-54 yrs.	10	16%
			55-61	2	3%

Table 4.1 shows the age of the mothers and midwives who participated in the study.

4.2.1.1. Age of the Mothers and Midwives

In the study that was conducted in hospital A, hospital B and hospital C,3(5%) of the mothers was between the age of 39-45 years old which is known to be advance maternal age. Between the ages of 32-38 years old only 17(22%) mothers participated in the study. The majority of the mothers was in the ages between 26-31 years at 25(32%), and 19-25 years at 24(31%) of mothers. About 8(10%) of the mothers were between the ages of 12-18 year. The age of the mothers was studied to identify the age group that had preterm labour in the selected hospital.

The majority of the midwives in the selected hospitals was between the ages of 27-33 years 19(31%). Those between the ages 34-40 years midwives were only 16(26%), and for those between the ages of 48-54 years, only 10(16%) midwives responded. Few midwives who were aged between 41-47 years, at 9(14%), and those between 20-26 years were 6(10%); while the ones between ages 55-61 years were only 2(3%). The age of the midwives was studied to

4.2.1.2 Gender of the Midwives

In the study that was conducted in the selected hospitals, about 61(98%) of females and only 1(2%) male participated in the study. Gender was studied to ensure that both males and females were included in the study and that the concept of nurse from Mercer's theory of maternal role attainment was included.

4.2.1.3 Marital Status of the Mothers

In the study that was conducted in selected hospitals. The marital status was studied to ensure that the sample represented all groups. About 59(77%) of mothers who participated

in the study were married, followed by the single mothers with 18(23%). All these mothers are from the selected hospitals.

4.2.1.4 Residential Status of Mothers
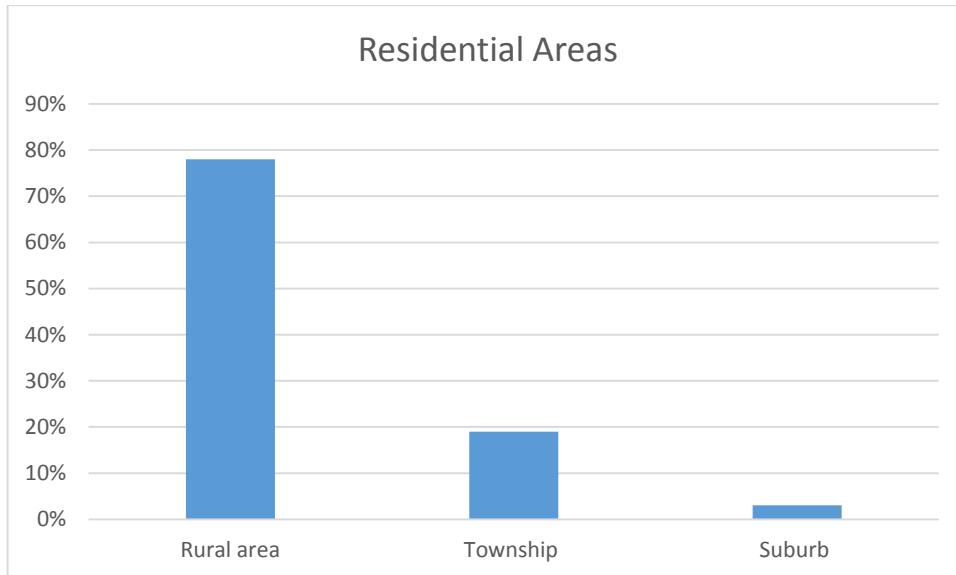
Figure 4.1: Residential Status for Mothers

Figure 4.1 shows the residential status of pregnant mothers who participated in the study, to easily identify were a majority of mothers with preterm labour stay. The residential status of the mothers was studied to ensure that the sample represented all groups. Figure 4.1 shows that the largest group of mothers, at 60(78%), was from the rural areas, whereas 15(19%) of mothers were from the townships and only a small group of mothers which constituted about 2(3%) were from the suburb. However, all these mothers are from the selected hospitals.

4.2.1.5 Educational Level of Mothers
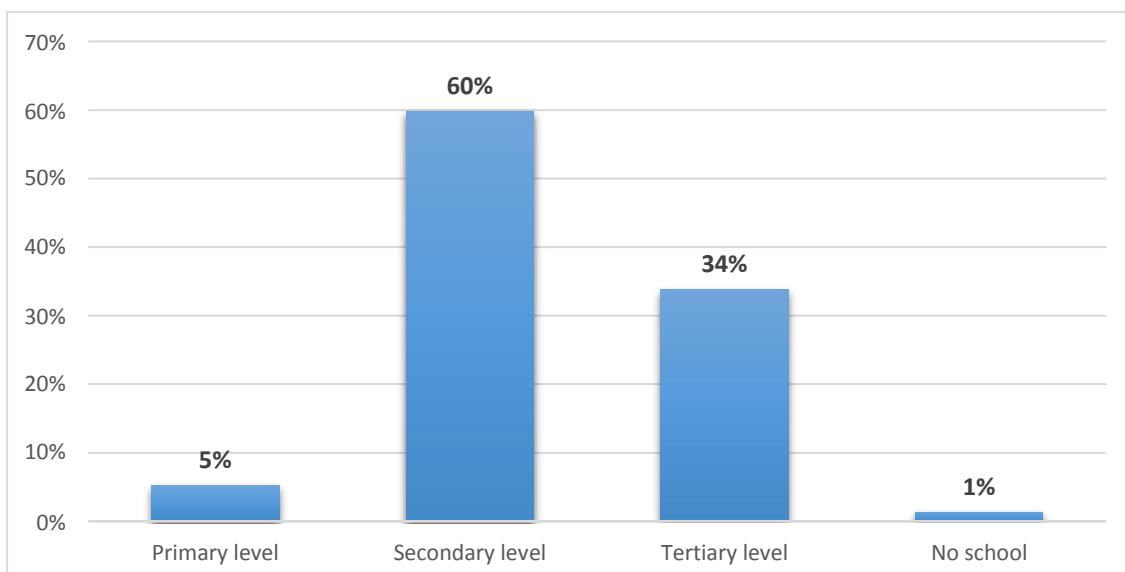
Figure 4.2: Educational Level of Mothers

Figure 4.2 shows the educational level of the mothers who participated in the study, to identify the level of education of mothers with preterm labour. Figure 4.2 shows that not all mothers who participated in the study went to school up to tertiary level. The figure further shows that more than half of the mothers which were 46(60%) attended school up to secondary level and only 26(34%) of the mothers went to school up to the tertiary level. The graph indicates that only 1(1%) of the mothers did not attend school at all and about 4(5%) of the mothers attended school up to primary level. All these mothers were from the selected hospitals.

4.2.1.6 Employment Status of Mothers
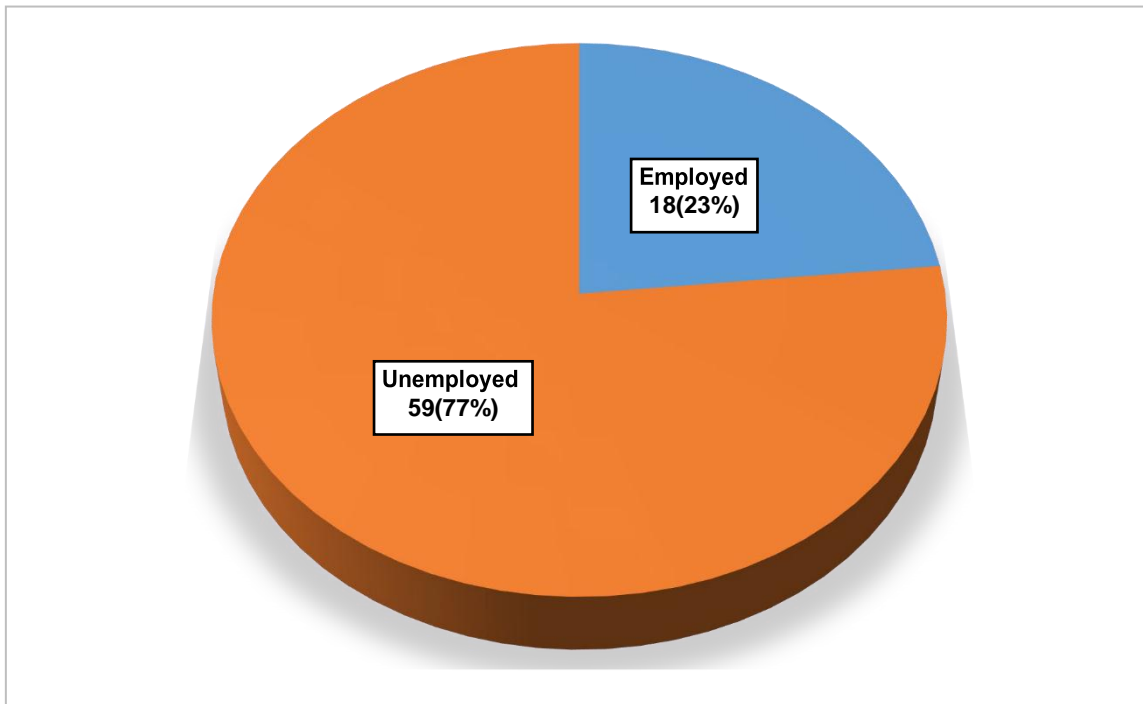
Figure: 4.3: Employment Status of Mothers

Figure 4.3 shows the employment status of the mothers who participated in the study. The employment status of the mothers with a history of preterm was studied to ensure that the sample represented all groups. More than half of the mothers who responded in the study were unemployed, at 59(77%), and about 18(23%) of the mothers who responded were employed. All these mothers are from the selected study site.

4.2.1.7 Nursing Qualification for Midwives
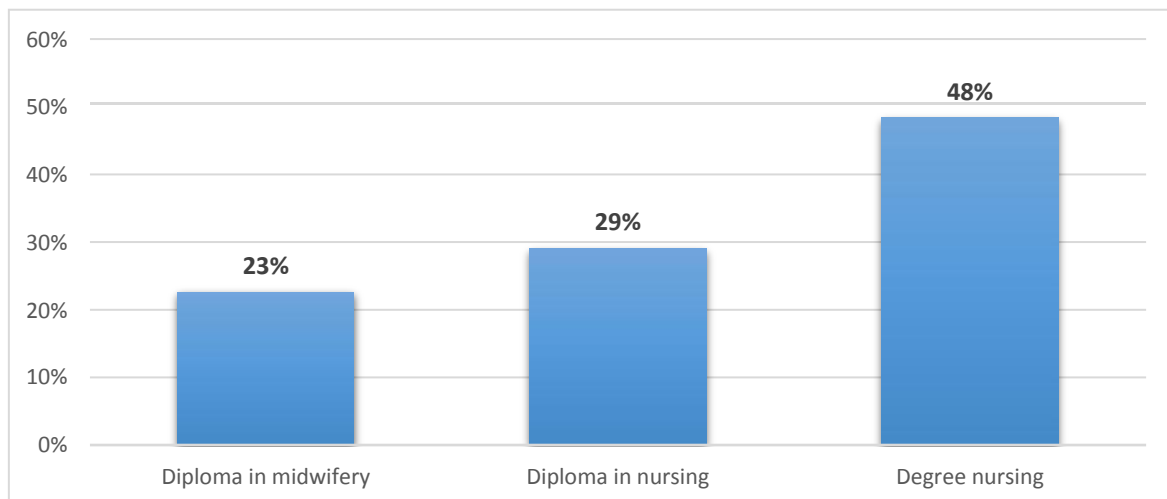
Figure 4.4: Nursing Qualification for Midwives

Figure 4.4 shows the nursing qualifications that the midwives obtain. The nursing qualifications of midwives was studied to ensure that the sample represented all groups, the figure 4.4 above indicates that about 30(48%) of midwives who participated in the study obtained degree in nursing as a qualification, about 18(29%) of midwives who participated in the study obtained Diploma in Nursing as their qualification and only 14(23%) obtained Diploma in Midwifery. These midwives participated in the study that was conducted in hospital A, hospital B and hospitals C.

4.2.1.8 Speciality Qualification for Midwives

Figure 4.5 Speciality Qualification for Midwives

Figure 4.5 indicates the speciality qualifications that midwives obtain, the speciality qualification was studied to ensure that the sample represented all levels of speciality and the concept nurse in the theory Mercer obtain the relevant qualification to care to mothers with preterm labour. Figure 4.5 shows that most of the midwives with 41(66%), who participated in the study did not have any specialty qualification in Advance Midwifery and Degree in Neonatology. However, 19(31%) of midwives who participated in the study had Advance Midwifery qualification and only 2(3%) had a Degree in Neonatology.

4.2.1.9 Work Experience
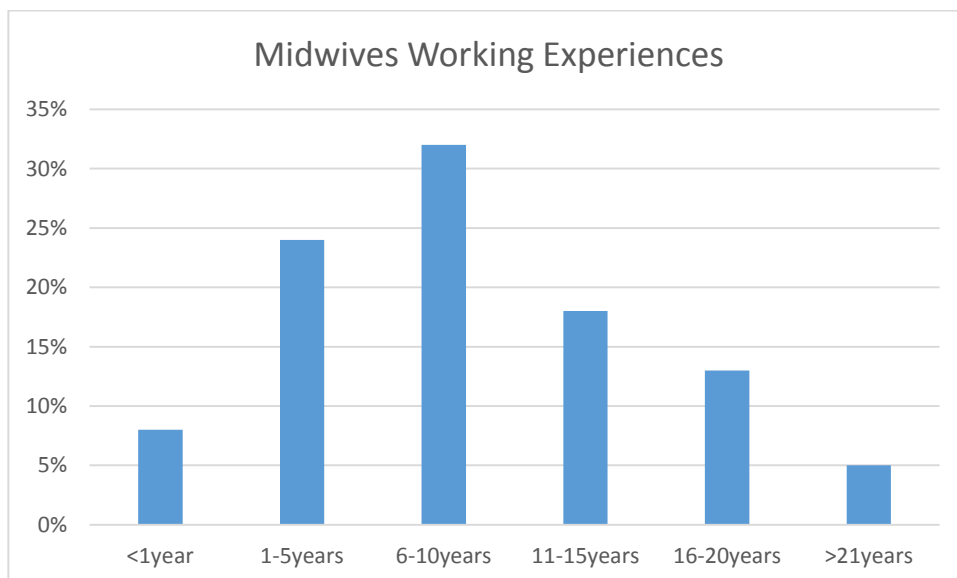
Figure 4.6: Work Experience

Figure 4.6 shows the work experience that midwives had in their current field of work. The work experience of the respondents was studied to ensure that the sample represented all groups. Figure 4.6 above represent the work experience of the midwives, 20(32%) of the midwives have 6-10 years of work experience in the midwifery line of work, about 15(24%) of the midwives have 1-5 years of work experience,11(18%) of the midwives have 11-15 years of work experience,8(13%) of the midwives have 16- 20 years of work experience,5(8%) of the midwives have less than a year of work experience and lastly about 3(5%) of the midwives have more than 21 years of work experience.

4.2.1.10 Current Allocated Ward for Midwives

Antenatal ward
31%

Labour ward
69%
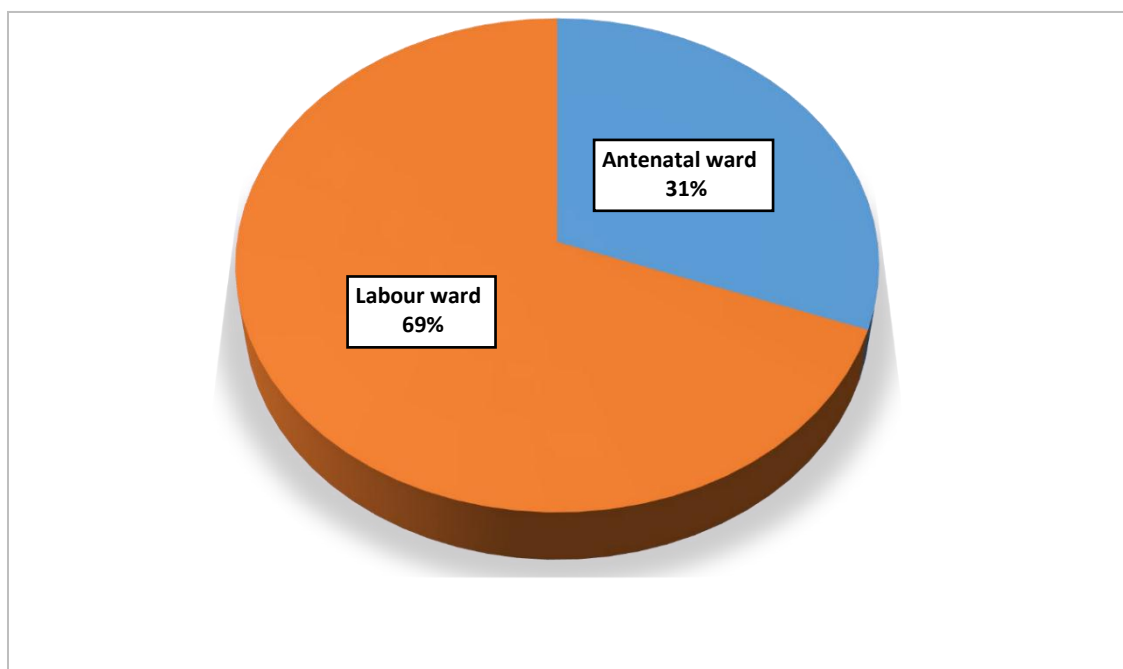
Figure 4.7: Current Allocated Ward for Midwives

Figure 4.7 shows the current allocated ward of midwives during the period of the study. The wards were studied to ensure that all the wards were midwives are employed are represented. Data were conducted in labour ward and antenatal ward in hospital A, hospital B and hospital C. Figure 4.7 shows that 43(69%) of midwives were allocated in the Labour Ward and 19(31%) of the midwives were allocated in the Antenatal Ward.

4.2.1.11 Financial Support for Mothers
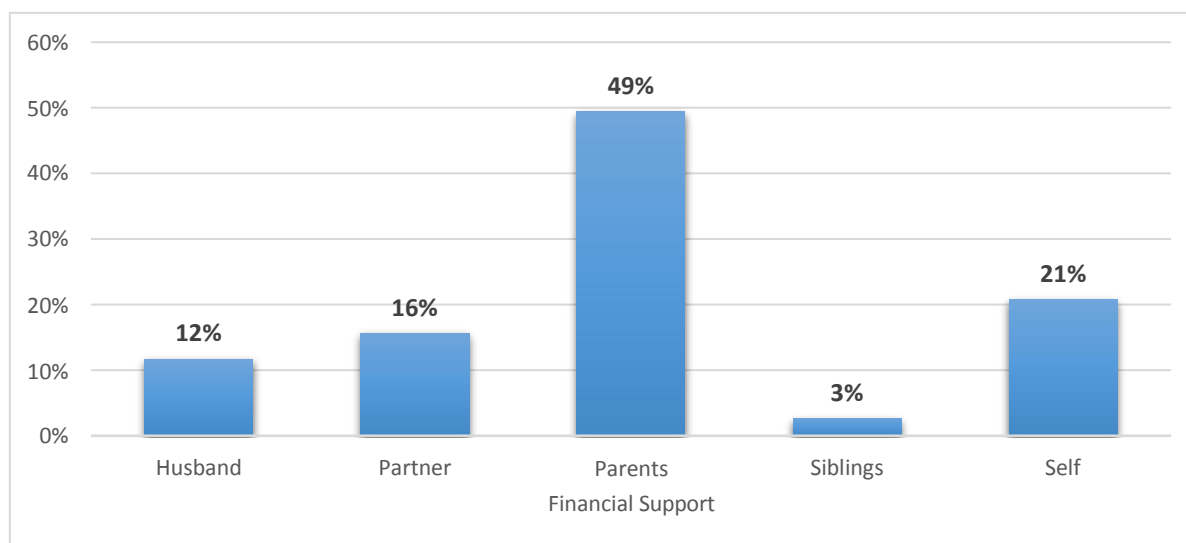
Figure 4.8: Financial Support for Mothers

Figure 4.8 indicates the financial support background of the mother who had preterm labour. The financial support was studied to identify the source of income of mothers with preterm labour. The figure indicates the financial support of the mothers to ensure that the sample represented all groups. In the study conducted, about 38(49%) mothers who gave birth prematurely depended on their parents for financial support. Moreover, 16(21%) mothers were employed, and 12(16%) mothers depended on their partners for financial support. However, only 9(12%) of the mothers depend on their husbands and 2(3%) of mothers depend on their siblings for financial support. All these mothers were from the selected institutions.

Section B: Accessibility for Mothers

Accessibility data included the following items: Distance from the mother's home to the nearest clinic, hospital and how did the mothers wait for an ambulance.

4.2.1.12 Clinic distance
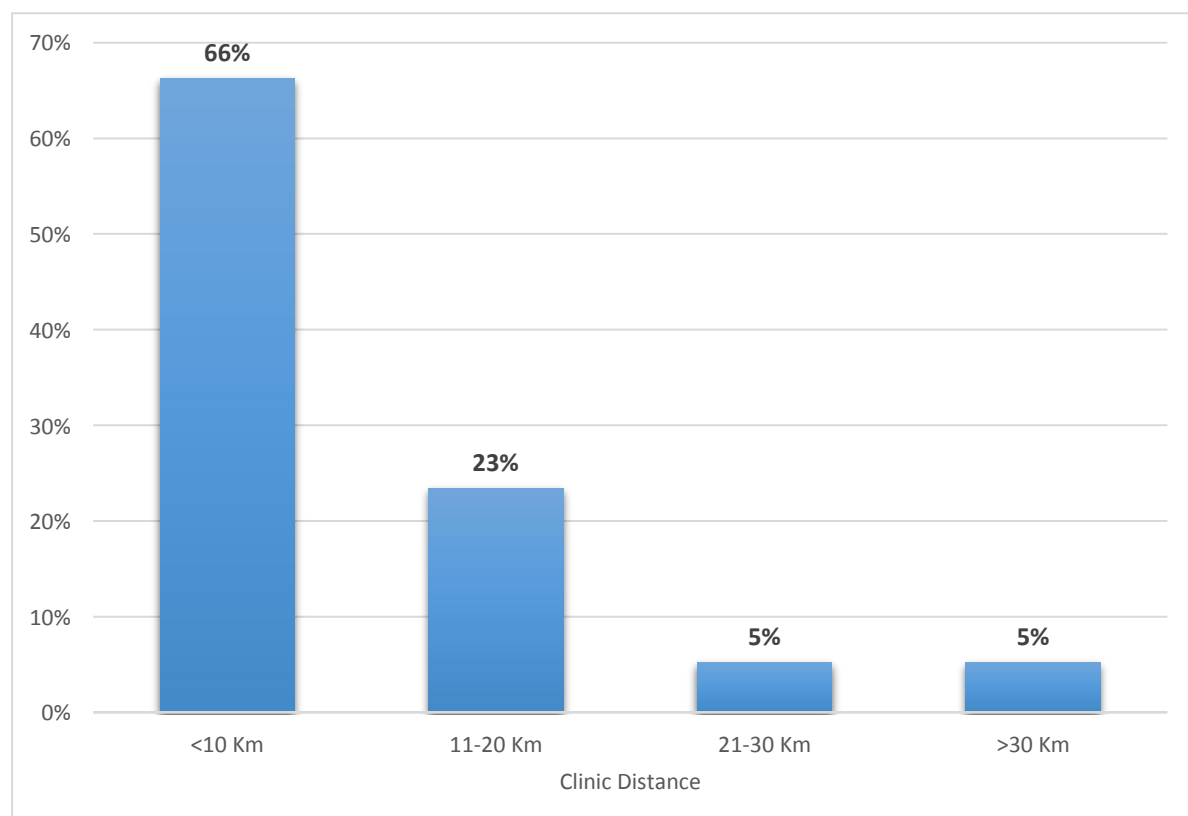
Figure 4.9: Clinic Distance

64

Figure 4.9 indicates the distance that the mothers walk or travel to reach the nearest clinic to access the ANC and emergency care (preterm labour). The distance to the local clinic of the mothers was studied to ensure that all the clinic distance the mothers travels was represented. Figure 4.9 above shows that 51(66%) mothers walk or travel <10km to their nearest clinic. On the other hand, 18(23%) mothers walk or travel 11-20km before they could reach to the nearest clinic. The longest distance that 4(5%) mothers travel to their nearest clinic is 21-30km and >30km.

The distance to the nearest hospital of the mothers was studied to ensure that the hospital distance of the mothers was represented. About 23(30%) of the mothers stays about 10km to the nearest hospital, 29(38%) of the mothers stays 11-20km to the nearest hospital, 17(22%) mother stays about 21-30km to the nearest hospital and only few, at 8(10%), of the mothers stay >31km to the nearest hospital.

4.2.1.13 Ambulance Waiting Period
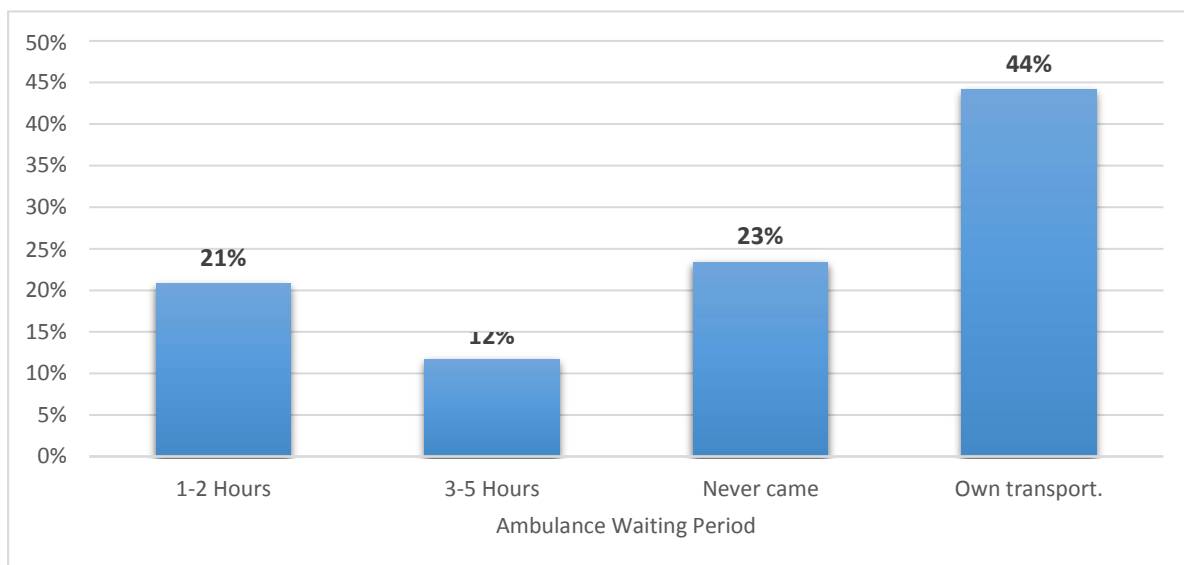
Figure 4.10: Ambulance Waiting Period

Figure 4.10 indicates the time that the mothers had to wait for the ambulance or the transport that they arranged during pregnancy to take them to the hospital in case they fall into labour. About 34(44%) of the mothers used their own transport. However, in some instances, the mothers had to arrange their own transport because the ambulance did not come or they were put on hold when they called for help, these was mentioned by some participants during the interview in the qualitative study.

The study revealed that about 18(23%) of mothers called an ambulance, but it never came, hence the percentage of mothers who used their own transport was high. There were 16(21%) of mothers who called an ambulance and waited for 1-2 hours for its arrival, however 9(12%) of mothers called for an ambulance and waited for 3-5 hours for the ambulance to arrive. Mothers who participated in the study were all from the selected hospitals.

Section C: Obstetric Data for Mothers

Table 4.2: obstetric Data that Mothers with Preterm Labour Had

Item	N	Yes	No
1. This is my second pregnancy.	77	30(39%)	47(61%)
2. I have being pregnant for more than 3 times but I do not have an alive baby at home.	77	3(4%)	74(96%)
3. I have delivered through normal vaginal delivery.	77	42(55%)	35(45%)
4. I have delivered through Caesarean Section.	77	35(45%)	42(55%)
5. I gave birth to an alive baby.	77	67(87%)	10(13%)
6. I have one preterm baby.	77	57(74%)	20(26%)
7. I have more than two preterm babies.	77	20(26%)	57(74%)
8. I have one abortion	77	5(6%)	72(94%)
9. I have a miscarriage	77	58(75%)	19(25%)
10. My miscarriage was in the first trimester.	77	14(18%)	63(82%)
11. My preterm labour was in the second trimester.	77	15(19%)	62(81%)
12. My preterm labour was in the third trimester.	77	52(68%)	25(32%)
13. My pregnancy was planned.	77	45(58%)	32(42%)
14. I was attending antenatal clinic when I had preterm labour.	77	64(83%)	13(17%)
15. I was not attending antenatal clinic when I had preterm labour.	77	13(17%)	64(83%)
16. When I had preterm labour, I was admitted at the hospital.	77	44(57%)	33(43%)
17. I had a 'spontaneous preterm labour'.	77	60(78%)	17(22%)
18. I had an 'indicated preterm labour' because of an ill health.	77	19(25%)	58(75%)

Table 4.2 above shows that the majority of mothers, at 47(61%), who participated in the study was not their second pregnancy when they had a preterm labour and only 30(39%) confirmed that it was their second pregnancy. More than half of mothers, at 74(96%), as shown in Table 4.2 above, were not pregnant for more than 3 times

without an alive baby at home. Whereas 3(4%) mothers have been pregnant for more than three times, and they do not have an alive baby at home. Table 4.2 shows that more than half of the mothers, at 42(55%), have delivered their preterm babies through normal vaginal delivery and about 35(45%) mothers did not deliver through normal vaginal delivery. The Table 4.2 further shows that 35(45%) mothers delivered through Caesarean Section, while 42(55%) did not deliver through Caesarean Section.

The majority of mothers, at 67(87%), who participated on the study delivered alive babies and 10(13%) preterm babies they delivered were not alive. Table 4.2 shows that most of the mothers, at 57(74%) had only one preterm baby and 20(26%) mothers did not have one preterm baby. About 20(26%) mothers had more than 2 preterm babies and could mean that few of the mothers who participated in the study have a history of having preterm babies, while many mothers with 57(74%) did not have more than two preterm babies.

Table 4.2 above indicates that only 5(6%) of the mothers had abortion and 72(94%) mothers did not have abortion. Table 4.2 shows that the majority of mothers who were 58(75%) they once had a miscarriage, whereas few mothers, 19(25%) did not have a miscarriage. Moreover, table 4.2 shows that 14(18%) of mothers had their miscarriage in the first trimester and 63(82%) of mothers did not have a miscarriage in the first trimester.

Table 4.2 shows that few of the mothers, at 15(19%), had preterm labour in the second trimester and the majority of mothers who were 62(81%) did not have a preterm labour in the second trimester. The study revealed that more than half of the mothers, at 52(68%), in the selected hospitals had their preterm labour in third trimester, while 25(32%) mothers did not have their preterm labour in the third trimester.

About 45(58%) mothers who participated in the study their pregnancy was planned, whereas 32(42%) mothers did not plan their pregnancy. More than half of the mothers, at 64(83%), who participated in the study claim that they were attending antenatal clinic when they had preterm labour while few mothers with 13(17%) indicated that they did not attend antenatal clinic when they had preterm labour.

Table 4.2 shows that 44(57%) mothers were admitted at the hospital when they had preterm labour and 33(43%) mothers were not admitted at the hospital when they had preterm labour. It is further shown in the table that for the 60(78%) of mothers who had preterm labour, it was spontaneous, and only 17(22%) mothers did not have a 'spontaneous preterm labour'. About 19(25%) mothers had 'indicated preterm labour' because of an ill health while 58(75%) mothers did not have preterm labour because of an ill health. The figures of 'spontaneous' and 'indicated preterm labour' do not correlate because the mothers completed the questionnaires looking at all the preterm labours that they had recently and had previously.

Table 4.3: Medical Conditions Diagnosed Prior or during Preterm Labour of the Mothers and the Midwife's Knowledge

"When I had preterm labour, I was diagnosed with the following" (mothers).

Item	N	Yes	No
1. I was diagnosed with chronic hypertension.	77	13(17%)	68(83%)
2. I was diagnosed with chronic Diabetes Mellitus.	77	5(6%)	72(94%)
3. I was diagnosed with gestational hypertensive disorders.	77	20(26%)	57(74%)
4. I was diagnosed with gestational Diabetes Mellitus.	77	4(5%)	73(95%)
5. I was diagnosed with HIV.	77	24(31%)	53(69%)

Table 4.3 shows the medical conditions that the mothers would have been diagnosed with prior or during preterm labour. Table 4.3 above shows that 13(17%) mothers were diagnosed with chronic hypertension when they had preterm labour and many mothers were 68(83%) not diagnosed with chronic hypertension. Table 4.2 further shows that only few mothers with 5(6%) were diagnosed with chronic Diabetes Mellitus and 72(94%) mothers were not diagnosed with Diabetes Mellitus when they had preterm labour. Table 4.3 indicates that 57(74%) mothers were not diagnosed with gestational hypertensive disorders when they had preterm labour and only a few mothers 20(26%) were diagnosed with gestational hypertensive disorders when they had preterm labour. The majority of mothers, at 73(95%), was not diagnosed with gestational Diabetes Mellitus when they had preterm labour, and 4(5%) mothers were diagnosed with gestational Diabetes Mellitus when they had preterm labour.

diagnosed with gestational Diabetes Mellitus when they had preterm labour. The study revealed that the majority of mothers who participated in the study that was conducted at the selected hospitals, about 53(69%) were not diagnosed with HIV when they had preterm labour whereas 24(31%) mothers were diagnosed with HIV positive when they had preterm labour.

Section D.1: Mothers' Knowledge

Table 4.4: How Much Knowledge Mothers Had during Their Pregnancy or upon Admission to the Hospital

Items	N	Yes	No
1. Do you know how to count gestational weeks and compare them with months?	77	37(48%)	40(52%)
2. Did you know that you can give birth before 37 weeks of gestation and the baby may survive?	77	60(78%)	17(22%)
3. Do you know the true signs of labour?	77	58(75%)	19(25%)
4. Do you know about the treatment of stopping preterm labour?	77	12(16%)	65(84%)
5. Did you know that unprotected sexual intercourse can cause preterm labour?	77	16(21%)	61(79%)

Table 4.4 above show that about 40(52%) of mothers who participated in the study did not know how to count gestational weeks and compare them with months while 37(48%) mothers knew how to count gestational weeks and compare them with months. According to the study conducted at the hospitals, 60(78%) mothers said that they knew that they could give birth before 37 weeks of gestation and the baby may survive.

Only few mothers, who were 17(22%), said that they did not know that they can give birth before 37 weeks of gestation and the baby may survive. However, 58(75%) mothers knew the true signs of labour and 19(25%) of the respondents said that they did not know the true signs of labour.

Table 4.4, in Section D above, shows that 12(16%) mothers knew the treatment of stopping preterm labour while the majority of mothers who were 65(84%) did not know about the treatment of stopping preterm labour. In Table 4.3 it shows that the majority of mothers, at 61(79%), did not know that unprotected sexual intercourse can cause preterm labour and only 16(21%) mothers knew that unprotected sexual intercourse can cause preterm labour.

Table 4.5: Information on *Tocolytic* Medication and Follow Up Visits Postnatally

Item	N	Yes	No
1. Were you given medication to stop labour pains?	77	22(29%)	55(71%)
2. When they discharge you in postnatal, were you given a follow update at gynaecology clinic for prevention of possible future miscarriages?	77	8(10%)	69(90%)

Table 4.5 indicates how many mothers were given *tocolytic* treatment or not during given *tocolytic* treatment when they had preterm labour, or any follow up done on them with the previous miscarriages if they had one. Table 4.5 shows that 55(71%) mothers were not given medication to stop labour pains and 22(29%) mothers were given medication to stop labour pains. The majority of mothers, at 69(90%), who participated in the study were not given a follow up date at gynaecology clinic for prevention of possible future miscarriages, while 8(10%) of mothers said that they were given the follow up date at gynaecology clinic for the prevention of possible future.

Table 4.6: The First Place You Went to Seek for Help (Mothers)

Item	N	Prophet	Sangoma	Clinic	hospital
1.When you were in preterm labour, you went straight to the...	77	0(0%)	1(2%)	16(24%)	49(74%)

Table 4.6 shows the first place that mothers opted to go to when they had preterm labour. According to the study conducted, Table 4.6 shows that 49(74%) of the mothers, when they were having preterm labour, they went straight to the hospital, 16(24%) went straight to the clinic, 1(2%) mother went straight to the sangoma and 0(0%) consulted a prophet, meaning there were no mothers who went to the prophet.

Table 4.7: Waiting Period before You Seek for Help (Mothers)

Item	N	1 Hour	2-3 Hrs	3-5 Hrs	>5 Hrs
1. After how long did you seek for help when you were in labour?	77	32(48%)	14(21%)	14(21%)	7(10%)

Table 4.7 shows the time that mothers waited before they could seek for medical help, when they had preterm labour. Table 4.7 above shows that 32 (48%) mothers sought

for help early within 1 hour when they were in labour, between 2-3 hours and 3-5 hours waiting period 14(21%) mothers waited for that period to seek for help when they were in labour. Few of the mothers, which were only 7(10%), waited for more than 5 hours to seek for help when they were in labour.

Table 4.8: Place of Birth (Mothers)

Item	N	Home	Clinic	Hospital
1. Where did you deliver your premature baby?	77	1(1%)	2(3%)	74(96%)

Table 4.8 shows the place where mothers gave birth, majority of the mothers, who were 74(96%), delivered their premature babies at the hospital, only 2(3%) delivered their premature babies at the clinic and, lastly, only 1(1%) delivered at home.

Section D.2: Midwives' Knowledge

Table 4.9: Midwives' Knowledge

Item	n	Yes	No
1. All pregnant woman diagnosed with hypertensive disorders can end up having preterm labour?	62	30(48%)	32(52%)
2. When hypertensive disorders are uncontrolled, the mother can deliver prematurely.	62	62(100%)	0(0%)
3. A mother may deliver prematurely Through Caesarean Section if the blood pressure is uncontrolled.	62	62(100%)	0(0%)
4. All pregnant woman diagnosed with gestational Diabetes Mellitus end up having a preterm labour?	62	26(42%)	36(58%)
5. Pre-rupture of membranes increase the chances of *Chorioamnionitis*.	62	62(100%)	0(0%)

Table 4.9 shows the knowledge that midwives have regarding preterm labour. Table 4.9 shows that 30(48%) of the midwives say that all pregnant woman diagnosed with hypertensive disorders can end up having preterm labour and more than half of the midwives, at 32(52%), opted that not all pregnant woman diagnosed with hypertensive disorders can fall have preterm labour. Table 4.9 shows that all the midwives' postulate that when the hypertensive disorders are uncontrolled, the mother can deliver prematurely, through Caesarean Section. Table 4.9 above shows that 26(42%) midwives mentioned that all pregnant woman diagnosed with gestational Diabetes Mellitus end up having preterm labour while 36(58%) of the midwives opted that not all pregnant woman diagnosed with gestational Diabetes Mellitus end up having preterm labour. All the midwives say that pre-rupture of membranes increase

the chances of *Chorioamnionitis*.

6. Name the leading cause of preterm labour in your in your institution.
   About 59(95%) midwives say that the leading cause of preterm labour in their institution is hypertension, 2(3%) midwives say that PROM is the leading cause of preterm labour in their institution and only 1(2%) said that gestational Diabetes Mellitus is the leading cause of preterm labour in their institution.
7. All midwives, at 62(100%), maintain that they can '*tocolyse*' a preterm labour only when the pregnant woman is in latent phase of labour.
8. All midwives, at 62(100%), assert that they cannot '*tocolyse*' a preterm labour when the pregnant woman is in the active phase of labour.
9. The recommended drug used in the selected institutions as the first line regimen of *Tocolysis* in the maternity guideline according to all midwives is *Adalat.*
10. About 43(69%) midwives say *Salbutamol* is recommended as the second regimen of *Tocolysis* according to the maternity guideline, 19(31%) midwives say that *Indocid* is recommended as the second regimen of *Tocolysis* according to the maternity guideline. *Adalat* and *Dexamethasone* were not recommended drugs as the second regimen of *Tocolysis*.

Section E: Lifestyle of Mothers

Table 4. 10: The Lifestyle Status of the Mothers Prior or during Pregnancy That Could Have Predisposed Them to Having a Preterm Labour

Item	n	Yes	No
1. I am underweight/malnourished.	77	13(17%)	64(83%)
2. I am overweight/obese.	77	15(19%)	62(81%)
3. I was smoking tobacco when I had my preterm labour.	77	5(6%)	72(94%)
4. I used to drink alcohol when I had my preterm labour.	77	6(8%)	71(92%)
5. Sometimes I do heavy duties at home	77	36(47%)	41(53%)
6. I was exposed to physical trauma on the day that I had miscarriage.	77	10(13%)	67(87%)
7. I drank herbal medication on the day that I had preterm labour.	77	7(9%)	70(91%)
8. I drank over-the-counter medication on the day that I had preterm labour	77	7(9%)	70(91%)

Table 4.10, in Section D, shows that most of mothers 64(83%), said that they were not underweight/malnourished, 13(17%) mothers were underweight; 15(19%) mothers were overweight; and the majority of mothers, at 62(81%), was not overweight. Table 4.10 shows that 72(94%) mothers did not smoke tobacco when they had preterm labour while 5(6%) mothers were smoking tobacco when they had preterm labour. Furthermore, 71(92%) mothers did not drink alcohol when they had preterm labour and 6(8%) mothers used to drink alcohol when they had their preterm

labour.

According to the study conducted, 41(53%) mothers did not do any heavy duties at their homes when they were pregnant, and 36(47%) mothers said sometimes they used to do heavy duties at home. The study showed that only 10(13%) mothers who participated in the study were exposed to physical trauma on the day that they had a miscarriage, and 67(87%) mothers were not exposed to any physical trauma on the day that they had a miscarriage. Table 4.10 shows that more than half of the respondents, 70(91%), did not drink herbal medication on the day that they had preterm labour nor drink over-the-counter medication on the day that they had preterm labour. About 7(9%) of the respondents drank herbal medication on the day that they had preterm labour and/or over-the-counter medication on the day that they had preterm labour.

Section F.1: Main Causes of Preterm Labour

Table 4.11: Main Causes of Preterm Labour

Item	N	Yes	No
1. Inability of the mother to count gestational age/incorrect gestational dates?	62	12(19%)	50(8%)
2. Inappropriate response to the lower abdominal pains.	62	44(71%)	18(29%)
3. Delay of the ambulance arrival at the clinic or patient's home.	62	34(55%)	28(45%)
4. Delay in seeking medical help?	62	51(82%)	11(18%)
5. Obese pregnant mother?	62	22(35%)	40(65%)
6. Malnourished pregnant mother?	62	43(69%)	19(31%)
7 Can heavy duties at home/work setting cause preterm labour?	62	59(95%)	3(5%)
8. Does heavy alcohol consumption during pregnancy cause preterm labour?	62	57(92%)	5(8%)
9. Does frequent smoking during pregnancy cause preterm labour?	62	59(95%)	3(5%)
10. Does abdominal trauma increase the chance of having a preterm labour?	62	62(100%)	0(0%)
11. Does maternal stress cause preterm labour?	62	59(95%)	3(5%)
12. Does advanced maternal age cause preterm labour?	62	30(48%)	32(52%)
13. Pregnant women with untreated *vaginosis* can end up having preterm labour.	62	61(98%)	1(2%)
14. Pregnant women with untreated urinary tract infection can end up having preterm labour.	62	61(98%)	1(2%)
15. Can a pregnant mother who is HIV positive with high viral load have preterm labour?	62	50(84%)	10(16%)

16. Can a pregnant woman with untreated syphilis have a preterm labour?	62	40(65%)	22(35%)
17. Can *antepartum* haemorrhage cause preterm labour?	62	60(97%)	2(3%)
18. Does Preterm Premature Rupture of Membranes (PPROM) increase the chances of having preterm labour?	62	61(98%)	1(2%)
19. Does teenage pregnancy increase the chances of having preterm labour?	62	37(60%)	25(40%)
20. Does a short cervix predispose a pregnant woman to having a preterm labour?	62	51(82%)	11(18%)
21. Can a pregnant woman with *polyhydramnios* falls into preterm labour?	62	52(84%)	10(16%)
22. Does multiple pregnancy increase the chances of having preterm labour?	62	60(97%)	2(3%)
23. Can severe anaemia cause preterm labour?	62	59(95%)	3(5%)
24. Does a history of preterm labour predispose a pregnant woman to have subsequent preterm labour?	62	60(97%)	2(3%)

Table 4.11 shows the main causes of preterm labour that mothers with preterm labour can present with at the hospitals. Table 4.11 above shows that more than half of the midwives, at 50(81%), maintain that the inability of the mother to count gestational age or incorrect dates is not the main cause of preterm labour. Whereas only 12 (19%) midwives agree that the inability of the mother to count gestational age or incorrect dates is the main cause of preterm labour. Table 4.11 above shows that the inappropriate response of the mother to the lower abdominal pains is the main cause of preterm labour with about 44 (71%) and only 18 (29%) respondents say 'no', the inappropriate response of the mother does not cause preterm labour.

In the study that was conducted, the delay of the ambulance arrival to the clinic or patients' home has shown that about more than half of the midwives, at 34 (55%), say it is the main cause of preterm labour while only 28 (45%) maintain that it is not the main cause of preterm labour. Table 4.11 above shows that the delay in seeking medical help is the main cause of preterm labour as it was shown by about 51(82%) of the midwives while 11(18%) say that the delay in seeking medical help does not cause preterm labour. Table 4.11 shows that obesity is not the main cause of preterm labour in the selected hospital that the study was conducted with 40(65%) midwives saying that, while only 22(35%) midwives concur that obese pregnant mothers can go into preterm labour. Table 4.11 above shows that the malnourished pregnant mothers 43(69%) can fall into preterm labour, while 19(31%) of malnourished pregnant mothers cannot fall into preterm labour. The majority of the midwives, at 59(95%), claim that heavy duties at home/workplace can cause preterm labour and 3(5%)

mention that the heavy duties at home /work does not cause preterm labour.

Table 4.11 shows that heavy alcohol consumption during pregnancy causes preterm labour 57(92%), while only few midwives, at 5(8%), said that heavy alcohol consumption during pregnancy cause preterm labour. It also shown in the table above that frequent smoking during pregnancy can cause preterm labour 59(95%) and few of the midwives, at 3(5%), say frequent smoking during pregnancy can cause preterm labour. Table 4.11 above shows that 62(100%) midwives concur that abdominal trauma causes preterm labour.

More than half of the midwives, at 59(95%), maintain that maternal stress causes preterm labour, and few, at 3(5%), midwives claim that maternal stress causes preterm labour. Table 4.11 shows that about 32(52%) of the midwives opine that advanced maternal age does not cause preterm labour and 30(48%) midwives hold that advanced maternal age causes preterm labour. The study revealed that about 61(98%) of pregnant mothers with *vaginosis* and untreated urinary tract infection can end up having preterm labour and only 1(2%) says that pregnant mothers with *vaginosis* and untreated urinary tract infections cannot end up having preterm labour.

In the Table 4.11, the majority of the midwives, at 50(84%), assert that a pregnant mother who is HIV positive with a high viral load can fall into preterm labour and only 10(16%) maintain that pregnant mothers with high viral load can fall into preterm labour. On the other hand, 40(65%) midwives who participated in the study claim that pregnant woman with untreated syphilis can have a preterm labour, and 22(35%) claim that the pregnant woman with untreated syphilis cannot have a preterm labour.

Table 4.11 above shows that 60(97%) of the midwives say that *antepartum* haemorrhage can cause preterm labour, while 2(3%) of the midwives mention that *antepartum* haemorrhage cannot cause preterm labour. According to the study conducted, about 61(98%) midwives state that PROM increases the chances of having preterm labour and only 1(2%) midwife says that PROM do not increase the chance of having preterm labour. Table 4.11 above shows that 37(60%) midwives maintain that teenage pregnancy increases the chances of having preterm labour and 25(40%) of the midwives assert that teenage pregnancy does not increase the

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chances of having preterm labour.

In the study conducted, 51(82%) of the midwives hold that a short cervix predisposes a pregnant woman into having a preterm labour, while only 11(18%) of the midwives' state that a short cervix does not predispose a pregnant woman into having a preterm labour. About 52(84%) of the midwives' postulate that a pregnant woman with *polyhydramnios* can fall into preterm labour, 10(16%) postulates that a pregnant woman with *polyhydramnios* cannot fall into preterm labour. Table 4.11 above shows that about 60(97%) of the midwives mention that multiple pregnancy increases the chance of preterm labour and only 2(3%) midwives opine that multiple pregnancy cannot cause preterm labour.

The study conducted shows that about 59(95%) midwives hold that severe anaemia can cause preterm labour and a few midwives of 3(5%) say that severe anaemia cannot cause preterm labour. According to the table 4.11 above, 60(97%) midwives claim that a history of preterm labour predisposes a pregnant woman to have subsequent preterm labour and 2(3%) of the midwives hold a history of preterm labour cannot predispose a woman to have subsequent preterm labour.

Section F.2: Personnel Possible Causes of Preterm Labour

Table.4.12: Personnel Possible Causes of Preterm Labour

Item	n	Yes	No
1.Disorientation of the midwife to the new work environment can further increase the chances of preterm birth?	62	30(48%)	32(52%)
2.Inexperienced midwife can increase the chances of preterm birth?	62	33(53%)	29(47%)
3.Does increased workload contribute to substandard examination of a pregnant woman?	62	57(92%)	5(8%)

Table 4.12 shows the personnel possible causes of preterm that mothers present with at the hospitals. Table 4.12 shows that 30(48%) of the midwives' state that disorientation of the midwife to the new work environment can further increase the chances of preterm birth, however, the majority of the midwives, at 32(52%), maintain the disorientation of the midwife to the new work environment cannot increase the

chances of preterm birth. Table 4.12 further shows that the inexperienced midwife can increase the chances of preterm birth 33(53%) and only 29(47%) of the midwives mention that the midwife who is inexperienced cannot increase the chances of preterm birth. The majority of the midwives, at 57(92%), hold increased workload contribute to the substandard examination of the pregnant woman and 5(8%) of the midwives hold that the increased workload does not contribute to the substandard examination of a pregnant woman.

Table 4.13: Preventative Measures

Item	N	Yes	No
1. Do you follow the maternity guideline when you *'tocolyse'* a pregnant woman?	62	62(100%)	0(0%)
2. Can you successfully '*tocolyse*' a pregnant woman in preterm labour?	62	62(100%)	0(0%)
3. Does the hospital have continuous supply of *tocolytic* treatment?	62	62(100%)	0(0%)
4. Cervical cerclage procedure can be done to prevent recurrent 'spontaneous preterm labour'.	62	61(98%)	1(2%)
5. Does your facility offer Outreach Programme on the prevention of preterm labour?	62	0(0%)	62(100%)

Table 4.13 shows possible preventative measures that can be taken to prevent the occurrence of preterm labour. All midwives 62(100%) claim that they follow the maternity guideline when '*tocolysing'* a pregnant woman, they can successfully '*tocolyses'* a pregnant woman in preterm labour and there is a continuous supply of *Tocolytic* treatment in the hospital. All 62(100%) of the midwives showed that the facility does not offer an Outreach Programme on the prevention of preterm labour.

4.3 Discussion of Quantitative Results for Women and Midwives

The findings from quantitative data analysis have revealed that mothers who had preterm labour or history of preterm labour most of them were women of childbearing age, few of them were advanced maternal age mothers and teenage mothers. The midwives mentioned that only 48% of advance maternal age causes preterm labour and 60% of teenage mothers has increase chances of having preterm labour. Mercer's Theory of Maternal Role Attainment supports the study's findings with a concept of nursing, whereby the nurse's role is to identify the potential health problems of the

advance maternal aged and teenage pregnant mothers during pregnancy, childbirth and in the postpartum period (Basavanthapa, 2007).

The study that was conducted by Montori et al. (2021); Lean, Derricott, Jones and Healzell (2017), supported the researcher's study, the advance maternal aged > 35 years and older and teenage pregnancy were associated with the additional risk of preterm labour and low birth weight, however, the optimal maternal age of 26-32 years was associated with minimal adverse outcome of pregnancy. The majority of the respondents are females, and they are allocated in the Antenatal Ward and the Labour Ward. Mercer's Theory of Maternal Role Attainment supports the study by defining the role of a nurse as a Health Care professional who have the most sustained and intense interaction with women in the maternity cycle. About 90% of females is employed in nursing (Milner, King, LaMotagne, Bentley & Kavanagh, 2018) and this was supported by Ngidi (2007).

The results indicated that most of the respondents did attend the antenatal clinic and only a few did not attend antenatal clinic, however, the quantitative study did not show the gestation at which the respondents started to attend the antenatal clinic. According to Mercer's Theory of Maternal Role Attainment, Basavanthapa (2007) postulate that the Obstetric Nurse's role during Antenatal Care is to diagnose and treat the maternal actual potential health problem that may predispose the mother to have a pregnancy outcome of preterm labour.

According to Azher, Aslam, Bano and Shahzad (2017), mentioned that about 62,5% of mothers who had preterm labour were unbooked for Antenatal Care at the Independent University Hospital. These findings show that there are still mothers who do not book for Antenatal Care when they are pregnant, despite the risk factors that they have. The results indicated that the majority of the respondents seeked for help within one hour when they had preterm labour. During the period of 2-3 hours and 3-5 hours, there was an equal number of respondents who sought help in that period and only few seeked for help late in >5 hours. The study shows that 82% of midwives said that delay in seeking medical help can be the main cause preterm labour. Basavanthapa (2007) supports the study with two concepts the nursing, environment, and health. Nurses have the most sustained and intense interaction with

women in the maternity cycle. They identify women at risk of preterm labour and refer them to the hospital and, through health education, they teach the mothers about true signs of labour and danger signs of pregnancy, so that when they experience them, they could go to the nearest health-care facility to seek help in time.

In the study conducted by Tesfalul, Feuer, Castillo, Coleman, O'Leary and Kuppermann (2021), they mentioned that prenatal care plays a crucial role in assessing and communicating preterm risks to the mothers. Tesfalul et al., (2021) mentioned that simulated counselling on imminent preterm delivery revealed that the expectant parents have difficulty recalling information secondary to anxiety, but also that counselling serves to lower their anxiety.

The quantitative results showed that the majority of respondents knew how to count gestational weeks and compare them with months, and that it is possible to give birth before 37 weeks of gestation and the baby may survive. The majority of the respondents indicated that they knew the signs of preterm labour, while a few did not know the signs of preterm labour. The majority of these respondents did not know that there is treatment that can be used to stop preterm labour if they arrive at the hospital in the latent phase. The quantitative results indicated that 100% of midwives follow the maternity guideline when '*tocolysing*' the mother and that they can only '*tocolyse*' the mother in the latent phase of preterm labour.

Mercer's Theory of Maternal Role Attainment does not define the environment but addresses the individual's culture, mate, family and/or support network, and the size of support as it relates to maternal role attainment. The theory supports the researcher's study because the respondents ended up giving birth to the preterm neonate, they will require the support from the mate and family to help them cope with the role of being a mother to the preterm neonate. The health status of the neonate is the extent of pathology present and the infant's health status may affect the mothers negatively, and the mother will require the family, friends, and mate's support (Basavanthapa, 2007).

According to the *Guidelines for Maternity in South Africa* (2015), if the woman's present with preterm labour and the cervix is >6cm dilated upon arrival at the health

facility, allow labour to progress and do not augment labour. If a woman is at ≥34 weeks gestational age or estimated foetal weight of ≥2kg if gestation is unknown, labour need to be managed like term pregnancies. Hence, most of the respondents were not given the *tocolytic* treatment because of what stipulated in *Guidelines for Maternity in South Africa*.

The quantitative results indicated that all midwives said that when hypertensive disorders are uncontrolled the mother can deliver through Caesarean Section prematurely. Moreover, all the midwives said that pre-rupture of membranes increases the chances of *Chorioamnionitis*, however, most of the respondents said that the mothers diagnosed with Diabetes Mellitus will not end up having preterm labour while few of the respondents said that the mothers with Diabetes Mellitus will end up having preterm labour.

Mercer's Theory of Maternal Role Attainment supports the study with the concept of nursing, whereby the Obstetric Nurse needs to identify the actual or potential health problems of the mother during pregnancy such as hypertensive disorders, Diabetes Mellitus and PPROM and refer to the mothers to the hospital to prevent complications. The study conducted by Bénin et al. (2020) mentioned that hypertensive disorders with complication such as foetal growth restrictions or without foetal growth restrictions, pre-eclampsia, eclampsia, HELLP syndrome and PPROM are the main causes of preterm birth. According to Choudhury and Rajeswari (2021), gestational Diabetes Mellitus is the leading cause of preterm delivery, infant mortality, and Caesarean Section delivery. The *Guidelines for Maternity in South Africa* (2015) supports the study finding by stipulating that *Chorioamnionitis* is associated with pre-labour rupture of membranes or prolonged rupture of membranes.

The study respondents at Mankweng, Pietersburg and Seshego Hospitals claim that they can '*tocolyses*' preterm labour only when the pregnant mother is in latent phase of labour and cannot '*tocolyses*' preterm labour when the pregnant mother is in active phase of labour. Furthermore, all respondents said that the recommended drug used in Mankweng, Pietersburg and Seshego Hospitals as the first line regimen of '*Tocolysis*' is *Adalat* as mentioned in the maternity guideline. The majority of the midwives mentioned that the second line regimen recommended drug of '*Tocolysis*' is

Salbutamol, and few mentioned that the second line regimen recommended drug of 'Tocolysis' is *Incocid*.

Mercer's Theory of Maternal Role Attainment supports the researcher's findings about the concept of nursing when she mentions that the role of Obstetric Nurse is to identify, diagnose, prevent, and administer treatment of mothers with actual health problems during pregnancy. In this case, the midwives will administer *Adalat* during the latent phase of preterm labour (Basavanthapa, 2007) to preterm birth.

According to Mullan (2018), the main *tocolytic*s used in United Kingdom (UK) are *Indomethacin*, *Nifedipine* and *Atosiban*, however, the licensed drugs in the UK Ritodrine and *Atosiban*. It stipulated in the Maternity Guideline Care in South Africa (2015) that the first line regimen recommended drug of *Tocolysis* is *Adalat* and the second line regimen recommended drug is *Salbutamol*.

4.4 Conclusion

This chapter presented the research finding for both the mothers and midwives in relation to the statistical analysis performed using SPSS version 25 with the help of the statistician. The chapter discussed the quantitative results of both the mothers and midwives.

The following chapter will discuss the qualitative results for mothers, midwives, and obstetricians.

CHAPTER 5

PRESENTATION AND DISCUSSION OF QUALITATIVE RESULTS, INTERGRATION OF RESULTS AND DEVELOPMENT OF STRATEGIES

5.1 Introduction

The researcher observed that almost every week mothers who delivered premature neonates from the peripheral hospitals are being admitted at Antenatal Unit for mother lodger in the Postnatal Unit of the hospital A. The aim of the study was to develop the strategies to enhance prevention of preterm labour in selected hospitals in the Capricorn District, Limpopo Province. Preterm labour is known as labour that occurs before 37 weeks of gestation and it can be prevented through primary and secondary prevention that are outlined in chapter 3.

The previous chapter discussed the quantitative results, this chapter presents the research findings from the individual's semi-structured Interview Guide. The interviews were conducted with twenty mothers, seven midwives and four obstetricians. Four themes and related sub-themes for mothers; three themes and related sub-themes for midwives and obstetricians emerged and are summarised on the tables below. This chapter also shows and discusses integration of the results and development of strategies.

5.2 Presentation of Themes and Sub-Themes

Four themes emerged during data analysis using the Tesch's Open Coding technique as outlined in Chapter 3. The emerged themes were categorized and clustered to their identified relationships. Direct quotes from the mothers are presented to support the study findings and the literature review is also presented to support the study findings.

5.3 Themes and sub-themes for mothers

TABLE 5.1 Themes and sub-themes for mothers

THEME	SUB-THEMES
5.3.1 Availability of health education at Primary Health Care (PHC).	5.3.1.1 Health education done at Primary Health Care (PHC).
5.3.2 Knowledge of Antenatal Care, labour and delivery.	5.3.2.1 Knowledge on commencement of ANC. 5.3.2.2 Knowledge on the causes of preterm labour. 5.3.2.3 Knowledge on signs and symptoms of preterm labour. 5.3.2.4 Knowledge on prevention of preterm labour. 5.3.2.5 Knowledge on treatment of preterm labour.
5.3.3 Availability of support services.	5.3.3.1 Availability of counselling services.
5.3.4. The attitude of healthcare professionals.	5.3.4.1 Negative attitude of midwives towards mothers.

Table 5.1 shows the themes and sub-themes that emerged during data analysis when using Tech's open coding technique.

5.3.1 THEME 1: Availability of Health Education at Primary Health Care (PHC)

In countries such as Sweden, Ahrne, Schytt, Andersson, Small, Adan, Essén and Byrskog (2019) say women with a normal pregnancy attend midwifery-led Antenatal Care which has eight to nine additional visits, with a referral to an obstetrician if a woman has complications. The content of the ANC includes checking the health of the mother and the unborn child, giving of health information, preparing women for labour and birth and parenting advice (Ahrne et al., 2019). The theme is supported by Mercer's Theory of Maternal Role Attainment on the concept of nursing, whereby the nurses are responsible for promoting health through health education, the nurses are pioneers in developing strategies for the clients with actual health problem during pregnancy (Basavanthapa, 2007).

5.3.1.1 Sub-Theme 1.1: Health Education Done at Primary Health Care (PHC)
Health education increases the knowledge and preventative among pregnant woman related to complications of pregnancy. Health education includes disease prevention, risk management and helps pregnant women to promote self -care behaviour among them during the antenatal period (Aldhafeeri, Alahmadi, Alalyni, Makhdoom, Abottalib & Almutairi, 2019). Based on the study conducted, the majority of mothers who

participated in the study said they were not given health education about preterm labour. One of the mothers who participated in the study said the following regarding health education:

> *"What I was not satisfied with, is that we were not given information and the other ways of preventing. The topics of pregnant women, you must tell us often. I have a baby, but somethings do change, isn't it? I cannot have an old information…so but when you educate us during the antenatal clinic, I will be able to know and ask questions or next time when I come, I ask questions reflecting*".

The participant did not receive sufficient health education, and this was supported by Wulandari, Laksono and Rohmah (2021) who mentioned that it is expected that women who attend ANC regularly receive sufficient information about pregnancy related complications.

However, only few mothers who participated in the study were given health education at the PHC. One of the mothers who participated in the study said the following with regards to health education:

> *"Yes, they gave us but in short, they told us that it is possible for the baby to be delivered before term".*

The above statement was supported by Wulandari, Laksono and Rohmah (2021). Moreover, some mothers who participated in the study mentioned that they received health education on their own and one of the mothers who participated in the study said the following with regards to health education:

> "*As we know the baby is delivered at nine months (37-40 weeks), I was doing research as the first-time mother, I knew that such things do occur. I had an app that sends me information every week about the development of the baby. If you feel unusual pains, you can visit the nearest clinic or doctor to get help. I did not see any blood or my water braking, my broke when I arrive at the hospital.*"

Mobile technology use such as *Mom Connect* helps to empower pregnant women with pregnancy related issues that enables them to seek for medical help in time (LeFevre, Dane, Copley, Pienaar, Parsons, Engelhard, Woods & Bekker, 2018).

5.3.2 THEME 2: Knowledge of Antenatal Care, Labour, and Delivery
According to the WHO report, lack of early antenatal booking in low-resource settings with loss of the opportunity for early gestational age determination, treatment of

infections, such as syphilis; dietary supplements; and early institution of Antiretroviral Therapy (Hofmeyr & Mentrop, 2015). However, Moller, Petzold, Chou and Say (2017) indicated that the new Antenatal Care model recommends that the first Antenatal Care visit takes place within the first trimester in the <12 weeks of gestational age with additional seven Antenatal Care visits. The timing of the initial first Antenatal Care visit is important to ensure optimal care and health outcome of the women and children (Moller et al., 2017). Delnord and Zeitlin (2019) stated that in the absence of the universal first trimester antenatal visits and ultrasounds for pregnancy dating, routinely collected gestational age is often not available or vulnerable to errors in maternal recall, as is the case today in most low- and many middle-income countries.

Basavanthapa (2007) supports the theme with Mercer's Theory of Maternal Role Attainment under the concept of nursing whereby the nurse needs to provide the pregnant woman with health education during health promotion about the true Antenatal Care, labour, and delivery at large.

5.3.2.1 Sub-theme 2.1: Knowledge on Commencement of Antenatal Care (ANC)
According to Abuka, Alemu and Birhanu (2016), mentioned that the Antenatal Care is more initiated in the second and third trimester, the first antenatal booking is affected by different associated factors such as maternal education, parity, experience of health service, knowledge and attitude towards pregnancy and its complications. Furthermore, older multiparity pregnancy women delay Antenatal Care booking and in contrast utilization of Antenatal Care is more common in younger women (Abuka, Alemu & Birhanu, 2016).

However, in the qualitative data conducted, most mothers who participated in the study commenced their Antenatal Care early in the first trimester, mostly in the second month. One of the mothers shared her views on when she commenced Antenatal Care, and this is reflected in the following extract from a mother who said:

> *"Eish because I was too much excited, I started very early. I used to buy pregnancy test kits and after knowing I went and started but by them, I was not sure about the gestational age but by then it was not yet one month."*

What the participant said is recommended in the *Guideline for Maternity Care in South Africa* (2016), that as soon as the mother suspect that they are pregnant or even as

early as first menstrual period is missed the woman need to book for Antenatal Care. Most of the mothers who participated in the study commenced their Antenatal Care late in the second trimester, mostly at four months of pregnancy. One of the mothers shared her views on when she commenced Antenatal Care, and this is reflected in the following extract from a mother who said:

> *"I booked early at four months (smiling). Yes. At three months, then I decided to start the following month. I was reluctant to attend antenatal clinic".*

However, in study conducted in Limpopo Province in Mopani District about 79% of pregnant women initiate Antenatal Care services late in the after 12 weeks of gestation (Mulondo, 2020). Furthermore, the study has shown that there are still mothers who do not book or attend antenatal clinic during pregnancy. One of the mothers who participated in the study said:

> *"I did not attend the antenatal clinic".*

There are still mothers who do not book for Antenatal Care due to various reasons, according to Abuka, Alemu and Birhanu (2016), in Nigeria only 9.2% of pregnant women did not attend Antenatal Care because of financial shortage.

5.3.2.2. Sub-Theme 2.2: Knowledge on the Causes of Preterm Labour
The qualitative data conducted on mothers indicated that most of the mothers did not know the causes of preterm labour but one of the mothers added by saying the following with regards to the causes of preterm labour.

> Mother 1 said*: "I don't know what could have cause this".*
> Mother 2 said: *"Some are caused by certain things like stress, some are caused by doing heavy duties, others I don't know because they are not caused by one".*

The level of education of pregnant women plays a significant role during pregnancy, 64% of pregnant women who are educated in Indonesia were informed about the pregnancy complications in general and 28% of pregnant women who are not educated did not have information on pregnancy related complication (Abuka, Alemu & Birhanu, 2016).

5.3.2.3 Sub-Theme 2.3: Knowledge on the Signs and Symptoms of Preterm Labour

Tamang, Dorji, Yoezer, Phuntsho and Dorji (2021) said the obstetric danger signs are discussed through health education and in the Mother and Child Health (MCH) handbooks of pregnant mothers by midwives which includes vaginal bleeding, high fever, preterm labour, severe abdominal pains, vomiting, severe headache and blurry vision or convulsions, fast or difficulty breathing and reduced or absent foetal movements. These obstetric danger signs are reinforced during each antenatal visits and postnatal visits (Tamang et al., 2021).

In the study conducted, most mothers who participated in the study did not have knowledge on the signs and symptoms of preterm labour. The midwives and obstetricians did not mention anything about the signs and symptoms of preterm labour. One of the mothers shared her views as follows:

> *"My membranes ruptured with no pains; I did not know what was happening. The water that was coming out was too little, I thought it will stop, then I stayed at home. The following day in the afternoon I started to experience the pains, then I just thought they will stop, then I went to the bathroom to defecate. After defecating the pains continued and I called a car. The pains were strong now, then, I realized that something is coming out. Then, when I touched, it was a baby coming out. I was so surprised because I know it was not time, it was still early".*

Only few mothers who participated in study had the knowledge on the signs and symptoms of preterm labour. One of the mothers shared her views as follows:

> *"Yes, I do know them, membranes ruptures and pains".*

The mothers' views regarding the knowledge on the signs and symptoms of preterm labour depend on the level of education of the pregnant women (Abuka, Alemu & Birhanu, 2016).

5.3.2.4 Sub-Theme 2.4: Knowledge on Prevention of Preterm Labour.

The specific knowledge gaps on pregnant women that needed to be addressed were methods to reduce the risk of preterm labour and preterm birth with a focus on seeking Antenatal Care so that known risk factors can be identified, counselling could occur, treatment be administered, and further preventative measures could be offered and discussed at the antenatal clinic (Antony, Levison, Suter, Raine, Chiudzu, Phiri, Sclafani & Belfort, 2019).

Based on the qualitative data conducted, the majority of them did not have knowledge on the prevention of preterm labour. One of the mothers shared her views as follows:

"I did not get information on that".

The view of the mother mentioned above on the knowledge on prevention of preterm labour is supported by the study conducted by (Abuka, Alemu & Birhanu 2016).

5.3.2.5. Sub-Theme 2.5: Knowledge on Treatment of Preterm Labour
According to Antony et al. (2019), the other specific knowledge gap identified that needed to be addressed was the management plans and options for women who are experiencing preterm contractions, preterm labour, preterm birth. The specific knowledge about medical care that can be given to the pregnant women who are in labour to help the baby when he or she born.

The qualitative data indicated that the majority of them did not know anything about *Tocolysis* and only few mentioned that they knew that there is treatment that can be used to stop preterm labour pains. One of the mothers shared her views as follows:

"I know the pills that can be given to stop labour, the other ones they can give to start labour if you do not fall into labour, so that you can give birth".

In the study conducted by Antony et al. (2019), it was discovered that there is a gap of knowledge about the treatment of preterm of labour.

5.3.3 THEME 3: Availability of Support Services
McLeisha, Harveyb, Redshawa and Alderdicea (2020) state that where health professionals do not provide the emotional support, social support, informational support, affirmational support that new mothers want in the immediate postnatal period, the interactions with health professionals may become an additional source of stress instead of buffering the stress level. Informational support is information provided by health professional to the mothers at the time of stress it includes information about a baby's health and development. The information support also includes the practical instrumental support which is the provision of tangible goods, services, or aid, in this context specifically help with caring for the baby (McLeisha et al., 2020). According to Negarandeh, Hassankhani, Jabraeli, Abbaszadeh and Best

(2021), supporting mothers decreases their anxiety, increasing the awareness, growth of self-confidence to their capabilities in taking care of their neonates.

The social support is a multi-dimensional concept, McLeisha et al. (2020) said that it is commonly analysed as having four functional aspects the emotional, appraisal (affirmational), informational and practical. Emotional support consists of words or actions that shows love, liking, empathy, respect, and trust, leading to the mother to believe that they are cared for, and valued appraisal or affirmational support is the communication of information to enable a positive self-evaluation, specifically affirmation of the rightness of what the mother has done or said (McLeisha et al., 2020).

Mercer's Theory of Maternal Role Attainment supports the theme on the concept of environment. However, Mercer's Theory of Maternal Role Attainment does not define the environment but addresses the mate's, friends and family love, support and nurturance were important factors in enabling the pregnant mother to be able to take care of her child. Moreover, Mercer's Theory of Maternal Role Attainment identifies parents, family and friends as sources that help a mother to cope (Basavanthapa, 2007).

5.3.3.1 Sub-Theme 3.1: Availability of Counselling Services

Shattnawi, Abdallah, Khater and Alashram (2021) mentioned that the separation between the mother and baby was reported to increase anxiety and stress of the mothers who gave birth to preterm babies. Some of the factors that contributed to anxiety and stress were lack of knowledge, unfamiliarity with the neonatal intensive care unit environment, the vulnerability of the baby and lack of support and counselling from medical staff were common challenges faced by mothers postnatally (Shattnawi et al., 2021).

The researcher has observed that during the interview some mothers needed support, they appeared to be emotional and felt like the midwives were not doing enough. One of the mothers shared her views about counselling services.

> *"Before you come to KMC, you need someone to explain to you before you can even see the baby. Isn't it that their babies are too small? You had a baby at nine months before, when you get there, you find a very small*

> *baby. You do not have hope. What they say is that we want breast milk, you do not have to stress. It is impossible not to stress?"*

The mother added by saying:

> *"I think their procedure is not fine. When you are that side, they don't tell you where the baby is. With my baby they just told me that my baby is fine is not sick, you will see the baby tomorrow. When you are that side you will hear other patients saying that they are going to breastfeed their babies. You go like, they going to breastfeed the babies? How? Nobody tells you the procedure, where is the baby, the baby is at which unit because of what, the weight of the baby, this is what is going to happen, do not be afraid of this and that".*

Moreover, other mothers received their source of support from their family members, the other shared her views on availability of counselling as follows.

> *"My parent is supportive, and my partner is supportive".*

The above-mentioned views by the mothers were supported by the studies conducted by Medinaa, Granero-Molina, Fernández-Sola, Hernández-Padilla and Ávila (2018); and Negarandeh et al. (2021), who mentioned that preterm birth is a situation for which parents are not prepared for, mothers who gave birth prematurely experience emotional shock, fear, anxiety, depression, and post-traumatic stress during hospitalization and require support.

5.3.4 THEME 4: The Attitude of Healthcare Professionals

In the study conducted by Michaelsen (2020), it was mentioned that some nurses had negative feeling about a patient, regarded the patient as too demanding or the patient's persona characteristics repulsive. The important health problems of the patient remained unrecognised. The patients had low expectations of nurses, lacked knowledge about what to expect of them and their views on their illnesses (Michaelsen, 2020). Mercer's Theory of Maternal Role Attainment supports the theme on the concept of health, whereby, if an Obstetric Nurse does not alley the health worry concerns of the mother and there is rejection of sick role by the nurses, these will affect the health status of the mother negatively during *antepartum* (Basavanthapa, 2007).

5.3.4.1 Sub-Theme 4.1: The Negative Attitude of Health Professionals.

Lack of respectful care from doctors and midwives, who were rude and known to abuse patients, may lead to dissatisfaction with the health system, reducing the likelihood of

seeking Antenatal Care and pregnant chose to deliver at home with a traditional birth attendant (Mannava, Durrant, Fisher, Chersich & Luchters, 2015).

According to the qualitative data conducted one the mothers was afraid to tell the midwife her symptoms of infections. One of the mothers shared her views as follows:

> *"When I go to the clinic, I was not talking about them, sometimes we are afraid of nurses".*

Michaelsen (2020) supports the mother's view mentioned above. The mother did not give the midwife the subjective data because she afraid.

5.4 Presentation of Themes and Sub-Themes for Midwives
6   Themes and sub-themes for midwives

Three themes emerged during data analysis using the Tesch's Open Coding technique as outlined in Chapter 3. The emerged themes were categorized and clustered to their identified relationships. Direct quotes from the midwives are presented to support the study findings and the literature review is also presented to support the study findings.

Table 5.2 Themes and Sub-Themes for Midwives

Themes	Sub-themes
5.4.1. Knowledge on preterm labour.	5.4.1.1 Knowledge on the causes of preterm labour 5.4.1.2 Knowledge on the prevention of preterm labour.
5.4.2 Midwifery practice during preterm labour.	5.4.2.1 Administration of *Tocolytic* treatment.
5.4.3 Knowledge on protocols and guidelines of preterm labour	5.4.3.1 Initial management when the woman presents in preterm labour.

5.4.1 THEME 1: Knowledge on Preterm Labour

According to Griggs, Hrelic, Williams, McEwen and Cypher (2018), a clinical review of 'spontaneous preterm labour' and preterm labour is presented with a focus evaluation and assessment, screening, diagnostic testing, treatment to prevent preterm labour, patient's education, communication, and support. Therefore, the nurses should be knowledgeable about the care of patients with preterm labour, patient education, recognition, and treatment for preterm labour.

5.4.1.1 Sub-Theme 1.1: Knowledge on the Causes of Preterm Labour

According to Gilman-Sachs et al. (2018), the main causes of preterm labour and/or preterm as follows the maternal risk, which involves the diabetes, high blood pressure, race, multiple gestation, obesity low weight, stress, tobacco, alcohol or substance abuse, intrauterine infections. Furthermore, in addition to what Gilman-Sachs et al. (2018); Bénin et al., (2020) mentioned that PPROM, hypertension with or without suspected foetal growth restriction, suspected foetal growth restrictions without hypertensive disorders, vaginal bleeding related to placenta previa or accreta are the main causes of preterm labour and preterm birth.

According to the qualitative data conducted, one of the midwives shared her view as follows regarding the knowledge on causes of preterm labour:

> *"The first one I can say is hypertensive disorders in pregnancy, we know that high blood it is a very one common disease that contribute nearly to the hypertensive disorders to prematurity. The second point is infections, there are a lot of infections that predispose the woman to preterm labour especially if they are not taken care of immediately, I can say things like Chorioamnionitis, like HIV infection maybe the mother is not taking the ARV's a lot of infections occur. And then the other thing I can say it is the Diabetic Mellitus, the other thing is premature rupture of membranes".*

The causes mentioned above were supported by the study that was conducted by Naidoo, Sartorius and Tshimanga-Tshikala (2016); and Delnord and Zeitlin (2019).

5.4.1.2 Sub-Theme 1.2: Knowledge on the Prevention of Preterm Labour

Prevention of preterm labour involves the primary and secondary prevention. According to Appiah-Sakyi and Konje (2015), the primary prevention involves provision of interventions prior and between pregnancies which enhance the mother's health and reduce the mother's risk to preventable adverse pregnancy condition. The secondary prevention requires the need to make an appropriate diagnosis when the mother present with preterm labour (Appiah-Sakyi & Konje, 2015).

> "*Ok, prevention of preterm labour, health education is the most important one. We educate our mothers not to work very hard because they can get preterm labour and then we do not have to allow them to smoke during pregnancy. And they must eat a balanced diet and do exercises that are not strenuous."*

The views of the midwives and the obstetricians mentioned above with regards to the

knowledge of prevention of preterm labour were also mentioned in the studies conducted by (Appiah-Sakyi et al., 2017; and Tyna et al., 2019).

5.4.2 THEME 2: Midwifery Practise during Preterm Labour

According to Griggs et al. (2018), nurses are the main point of contact during the evaluation and direct bedside care to women who are experiencing signs and symptoms of preterm labour. Therefore, the knowledge of identification, care and treatment are important.

5.4.2.1 Sub-Theme 2.1: Administration of Tocolytic Treatment

The qualitative data conducted one of the midwives shared her views as follows on the midwifery practise during preterm labour.

The midwife said:

> *"Usually, it depends on the doctors what they prefer. Some of them because we do not have the protocols. We follow up the doctors' orders. Some prefer us to give the mother 20mg Adalat tds. Others prefers that we give them 20 mg on each contraction. When the mother complains of pain, we give her after every two hours. Many says so, but others say 20mg tds. One may tell you that 20 mg every two hours if the pains persist until the pain stops then we stop".*

The other midwife added by saying:

> *"We use Nifedipine we use 30 mg stat per os and thereafter we use 10 mg six hourly to tocolyses".*

According to what participants mentioned the *tocolytic* treatment *Nifedipine* is administered differently from the *Guidelines for Maternity in South Africa* (2015), in the selected hospitals. *Nifedipine* is administered according to an obstetrician's prescription.

5.4.3 THEME 3: Knowledge on the Protocols and Guidelines of Preterm Labour

The clinical practice guidelines and protocols are developed to improve the quality of care, to reduce variation of practice and to ensure that evidence is used when appropriate. When the professional does not adhere to guidelines and protocols patients may in the emergency care may not receive appropriate care and quality of care can be threatened (Ebben, Vloet, Verhofstad, Meijer, Groot & Van Achtenberg, 2013). Mercer's Theory of Maternal Role Attainment supports the researcher's study with the concept of nursing whereby the Obstetric Nurses, who are guided by the

maternity guidelines and protocols when caring for mothers, would be able to promote health, diagnose and treat the mother's actual health problems during pregnancy, childbirth and in the postpartum period (Basavanthapa, 2007).

5.4.3.1. Sub-Theme 3.1: Initial Management When the Woman Presents in Preterm Labour

According to the *Guidelines for Maternity Care in South Africa* (2015), the initial management when a pregnant woman presents with preterm labour is to look for the possible cause such as vaginal discharge, urinary tract infection and urine MCS before starting with antibiotic and run a CTG trace. According to the qualitative data collected, one of the midwives shared her view on the initial management when the woman presents in preterm labour.

> *"Firstly, you will have to detect the foetal heart rate, you monitor the foetal heart rate to see whether the baby is fine".*

5.5 Presentation of Themes and Sub-Themes for Obstetricians

7   Themes and Sub-themes for obstetricians

Table 5.3: Themes and sub-themes for obstetricians

Themes	Sub-themes
5.5.1 Availability of resources in the facility	5.5.1.1 Supply of preventative resources for preterm labour.
5.5.2. Identified gaps	5.5.2.1 Inadequate health education 5.5.2.2 Shortage of staff 5.5.2.3 Laboratory turnaround time
5.5.3 Knowledge on preterm labour and delivery	5.5.3.1 Identified major causes of preterm labour in the selected hospital.

5.5.1 THEME 1: Availability of Resources in the Facility

According to Wakeam, Hevelone, Maine, Swain, Lipsitz et al. (2014), hospital clinical resource availability depends on a hospital's financial health, which is affected by the population it serves, market condition and payment rates. The theory of Mercy did not mention anything regarding the availability of health-related resources that will help the mother regarding the maternal role attainment (Basavanthapa, 2007). However, with the concept of nursing the Obstetric Nurse can only be able to make certain diagnoses if the resources such urine dipsticks are available, treat infections or refer to the hospital for further management.

5.5.1.1 Sub-Themes 1.1: Supply of Preventative Resources for Preterm Labour

In a referral hospital, available resources should be allocated both to investments in new skills, facilities, and equipment. The aim of resource availability in a referral hospital is to improve patient care and management (Mpaata, Okiria & Lubogoyi, 2017). According to the qualitative data conducted, obstetricians shared their views as follows regarding the supply of preventative resources for preterm labour.

> *"We have got resources, we have our ultrasounds, we can insert the cervical cerclage but at the lab we normally don't do fibronectin and we can also detect the group B- Streptococcus bacteria's through the lab".*

The other obstetrician shared her views as follows.

> *"It's 50-50 types of things, in a sense that sometimes like you know this environment that one day things are available, but the next week things are no longer available. Like a vaginal swab, when you look for swabs, they are not there".*

Mpaata, Okiria and Lubogoyi (2017), said that the physicians, nurses, and other staff are productive when they are adequately built, equipped, and supplied with facilities.

5.5.2 THEME 2: Identified Gaps

The largest gap identified in the health centre was the nursing officers in the study conducted by Tetui, Ekirapa, Bua, Mutebi, Tweheyo and Waiswa (2012). Another gap that was identified in the study conducted by Siddique, Perkins, Mazumder, Haider, Banik et al. (2018), is that counselling on the danger signs was mostly a neglected component. Moreover, the study also found that the ANC contact is better in the private sector in terms of performing physical examination, ultrasound, and danger sign counselling (Siddique et al., 2018). Mercer's Theory of Maternal Role Attainment does not mention anything regarding the gaps that can be identified regarding maternal role attainment.

5.5.2.1 Sub-Themes 2.1: Inadequate Health Education

Gutierrez, Kindratt, Pagels, Foster and Gimpel (2013) said that shared decision making between the providers and patients. The providers not only give the patient diagnosis and treatment plan verbally but the interactive exchange to empower the patients and allow them to ask questions and make decisions about their health. This

collaborative communication can be augmented by the use internet and direct email communication (Guitierrez et al., 2013).

According to the qualitative data conducted one of the obstetricians shared their views as follows:

> *"Health care workers are not doing enough to educate and empower these woman".*

These was supported by the study that was conducted by Wulandari, Laksono and Rohmah (2021).

5.5.2.2 Sub-themes 2.2: Shortage of staff

According to Mburu and George (2017), the shortage of doctors and nurses in the rural provinces such as Mpumalanga, Northern Cape and Limpopo are due to inadequate salaries and wages; poor and unsafe working conditions; lack of career development opportunities; lack of management support and supervision; work overload; emotional burnout; inadequate resources; and poor infrastructure.

According to the qualitative data collected one of the obstetricians shared their view as follows regarding shortage of staff:

> *"The clinic system is overwhelmed; the nursing staff have to do many things at once. The Antenatal Care has been simplifies but we are achieving it quite well. We are going to miss the real patients. They are overwhelmed if you can check Seshego and Mankweng hospital. It's not nice they are the busiest hospitals in the area and that is going to contribute to missing patients. I think we are not coping. People come in and go as if they not even coming to help the health system".*

Shortage of midwives was found to be a problem in developed countries and middle-income countries of which in the public sector it influences maternal outcome in a negative manner (Matlala & Lumadi, 2019). What the participant mentioned above was also supported by the study conducted by (Mburu & George, 2017).

5.5.2.3 Sub-themes 2.3: Laboratory turnaround time

Results of laboratory tests ordered by obstetricians in the emergency department are an important factor in patient management decision. The ability of the hospital to provide fast turnaround time of samples is considered an essential performance of the

laboratory and it can improve the operational efficiency of the emergency department such maternity department in this case (Kaushik, Khangulov, O'Hara & Arnaout, 2018).

According to the qualitative data collected one of the obstetricians shared their views regarding laboratory turnaround time as follows:

> *"The NHLS it delays to give us results, so by the time they give us the results the patient has delivered, patient is now lost in the system. It's just difficult to trace them back unless the patient comes back presenting with the same complaint and maybe still having the old file".*

The causes of delay in turnaround time at the laboratory may be due to volume of samples that need to be processed. This workload creates more situations where technologists are distracted with other tasks while trying to retrieve a sample to repeat a critical value (Sun, Garcia & Hayden, 2018).

5.5.3 THEME 1: Knowledge on Preterm Labour and Delivery

The physicians have agreed that some clinical conditions such as severe preeclampsia, maternal renal disease, poorly controlled diabetes, oligohydramnios, multifetal pregnancy, and intrauterine growth retardation are appropriate clinical condition for early delivery of the baby (Power, Henderson, Behler & Schulkin, 2013). Mercer's Theory of Maternal Role Attainment supports the researcher's study with the concept of nursing, whereby the Obstetric Nurse diagnoses the mother and refers her to the hospital for further assessment and management (Basavanthapa, 2007).

5.5.3.1 Sub-Themes 1.1: Identified Major Causes of Preterm Labour in the Selected Hospital

According to Mullan (2018), the principle leading cause of preterm birth are 'spontaneous preterm labour', preterm prelabour rupture of membranes and iatrogenic causes. According to the qualitative data collected the identified major cause of preterm by obstetricians who participated in the study shared their views as follows.

> *"One of the leading causes that we usually see in clinical practice is infection and the leading organism being group-B Streptococcus"*

Infection/inflammation, ischemia/haemorrhage, uterine distension, and other immunologically mediated processes are associated with causing preterm labour

(Ambia & Hossain, 2021).

5.6 Integration of Quantitative and Qualitative Results

The numeric and narrative results of the mothers, midwives and obstetricians are presented in figure 5.2. The quantitative results that emerged from the questionnaires were used to design qualitative interviews. These methods complemented each other based on the findings since more information and support of findings emerged. Quantitative results revealed that mothers received little health education about the causes, signs and symptoms and prevention of preterm labour at the PHC and qualitative results revealed that midwives were not doing Community Outreach Programmes in their facilities to empower mothers with information regarding preterm labour.

Qualitative results revealed that mothers who had information regarding preterm labour received the health education from internet, parents and in short from midwives as mentioned by some participants. The *primigravida* and *multigravida* mothers who participated in many of them did not know the causes of preterm labour, preventative measure of preterm labour. However, few mothers that had information on preterm labour received it through internet search and in short at the PHC.
 Moreover, the midwives and obstetricians in qualitative results revealed that health education should start at the PHC level and other obstetricians emphasized that the level of education of pregnant mothers that they serve is important factor.

Most of the mothers mentioned that they were not sure if it was labour pains because they were not due, hence through an ongoing health education mothers can present earlier at the healthcare facilities and be *'tocolysed'* in case of preterm labour. The study has revealed that administration of *Tocolysis* is done according to the obstetrician's prescription in the selected hospitals. The diagnosing preterm labour early in the latent phase of labour, when the mother has no comorbidities is to *'tocolyse'* the mother and allow the pregnancy to progress to term. Most of the mothers

who presented with preterm labour were not *'tocolysed'*, these could be because they arrived at the hospital or clinic in while in their active phase of labour.

Quantitative results revealed that mothers with preterm labour they were attending antenatal clinic, however, the qualitative results revealed that the majority started to attend antenatal clinic in their second trimester. The qualitative results revealed the midwives and obstetricians noticed that some mothers do not book for antenatal at all while others book very late, despite knowing that they are high-risk patients. Quantitative results revealed that only few mothers who had preterm labour were diagnosed with chronic hypertension/diabetes, gestational hypertension/diabetes and HIV and that mothers fell into 'spontaneous preterm labour'. The quantitative results revealed that according to the midwife's other causes of preterm labour is being HIV positive with high viral and untreated UTI.

The quantitative results revealed that PPROM, *antepartum* haemorrhage, short cervix, *polyhydramnios*, multiple pregnancy, severe anaemia cause preterm labour. This is supported by literature and qualitative results revealed that the causes of preterm labour are multifactorial as mentioned by the midwives and the obstetricians during the interviews. Most of the obstetricians mentioned infection as the leading cause of preterm labour, with the *Streptococcus-B* being the leading causative organism. The quantitative results revealed that cervical cerclage placement can prevent preterm labour according to the midwives and the obstetricians in qualitative results revealed that cervical cerclage placement can prevent preterm labour and that there is a continuous supply of resources used to perform the procedure.

5.7 Development of Strategies to enhance Prevention of Preterm Labour

STRATEGIES TO ENHANCE PREVENTION OF PRETERM LABOUR

STRENGTHENING OF BANC PLUS TO ENHANCE OPTIMAL ANTENATAL BOOKINGS BY PREGNANT WOMEN

STAFF ESTABLISHMENT TO ADRESS SHORTAGE OF STAFF FOR MIDWIVES AND OBSTETRICIANS

LABORATORY TURNAROUND TIME FOR TREATMENT OF INFECTIONS AND CERVICAL CERCLAGE

OUTREACH PROGRAMMES REGARDING FOR IMPROVEMENT OF HEALTH EDUCATION TO WOMEN

IMPROVEMENT OF COUNSELLING AND SUPPORT SERVICES

Figure 5.1: Developed Strategies to Enhance Prevention of Preterm Labour in the Selected Hospitals

Figure 5.1 depicts the strategies developed to enhance prevention of preterm labour in the selected hospitals, Capricorn District, Limpopo Province. These strategies were developed based on the identified factors that might hinders the prevention of preterm labour and after exploring the knowledge and practice of midwives and obstetricians in the selected hospitals, Capricorn District, Limpopo Province.

The Strategies to enhance Prevention of Preterm Labour are discussed as follows:

- **Strengthening of Basic Antenatal Care Plus (BANC PLUS) to enhance optimal Antenatal booking by pregnant women**

The majority of the mothers who delivered preterm babies during the period of study and who had a history of preterm labour, booked late for their Antenatal Care and some mothers did not book for ANC. There were still mothers with known risk factors

for preterm labour and did not book for ANC. Therefore, these shows that the mothers had no information regarding Bank Plus and when to book for Antenatal Care Services.

Antenatal Care is one of the recognised strategies by the WHO, to help in the reduction of unbooked cases thus prevent preterm labours and prevent the increase of Maternal and Perinatal Morbidity and Mortality Rates, that might be influenced by preterm births. According to the *Guideline for Maternity Care in South Africa* (2016), the pregnant women need to book for ANC as soon as the first menstrual period is missed preferably <12 weeks of gestation and attend subsequent ANC visits at 20 weeks, 26 weeks, 28 weeks, 32 weeks, 34 weeks, 38 weeks and at 41 weeks if the mother is still pregnant.

- **Staff establishment to address the shortage of midwives and obstetricians**

The objective of having appropriate number of midwives and obstetricians is essential in rendering quality patient care. Based on the qualitative data collected, the obstetrician mentioned that the clinic system is overwhelmed, particularly the nursing staff, and further mentioned that "I think we are not coping". These shows a need to hire enough staff.

The appointment of persons should be based on training, skills, competence, knowledge in order to redress in accordance with the Employment Equity Act, 1998 (Act No.55 of 1998). Hiring of appropriate and relevant employees is of prime importance in order to meet the requirements of the institution and for optimal deliverance of services expected.

- **Turnaround for laboratory turnaround, time for treatment of infections and cervical cerclage**

The objective of laboratory turnaround time affects management of mothers, and this contributes to the worsening of the maternal health condition. The other obstetrician mentioned that the NHLS delays giving them results. By the time the results are out, the mother would be lost in the system, and it would be difficult to trace them, unless if they would later come back, presenting with the same complaint, and having the

old file. The hospital turnaround time needs to be re-evaluated.

Treatment of Infections and Cervical Cerclage Placement

The main objective of treating the maternal infections during antenatal period and screening for cervical length and placing a cervical cerclage are the available preventative measures that were mentioned by the obstetricians in the selected hospitals. However, mothers seemed not to have information on cervical cerclage placement. One of the obstetricians mentioned that resources, such as vaginal swabs, are not always available in the hospital and laboratory take a long time to release the results.

- **Emphasis Outreach Programme for the improvement of health education to women**

The objective of Outreach Programme will be to enhance improvement of health education to women in order to promote health, prevention of disease and death. Health education provides learning experiences on various health topics to the correct target population.

Empowerment regarding preterm labour and the preventative measures could be given to the *primigravida* and *multigravida* mothers.

Pamphlets can also be issued, and clients be made aware of the internet search as well.

- **Improvement of Counselling and Support Services**

Post preterm birth, mothers require counselling and support services to help them to acquire coping mechanisms and enable them to hold and take care of their neonates during their stay in the hospital.

5.8 Conclusion

This chapter discussed the themes and sub-themes that emerged from the raw data from the mothers, midwives and obstetricians that participated in the study. The mothers who were interviewed most of them mentioned that they commenced for Antenatal Care in their second trimester. The qualitative data revealed that there is a gap of knowledge related to the preterm labour and that mothers who delivered the

neonates prematurely did not receive enough support from the midwives which was highlighted by the obstetricians. The midwives administered *Tocolytic* treatment according to the obstetrician's prescription in all selected hospitals.

This chapter also discussed the integration of results and developed strategies to enhance prevention of preterm labour that emerged from the study. About 7 strategies were developed from the study, which included the following: BANC plus, shortage of staff; health education; laboratory turnaround time; treatment of infections; and cervical cerclage placement and support services provided after preterm birth.

CHAPTER 6
SUMMARY, LIMITATION AND RECOMMENDATIONS

6.1 Introduction

The previous chapter discussed integration of result and developed strategies to enhance prevention of preterm labour. This chapter discusses the summary of the study, limitations of the study and recommendations that emerged from the study findings. The recommendations were formulated based on the findings of the study in relation to research, identified factors that hinders the prevention of preterm labour and the explored knowledge and practise of midwives and obstetricians.

6.2 Summary of the Study Results

The researcher adopted the sequential explanatory mixed method study research design which allowed one strand to (quantitative) to occur prior and followed by the second strand (qualitative). Therefore, the well-conceived sequential explanatory mixed method designs the analysis and the interpretations in one phase informed the collection and analysis in the second strand. The goal of this design was to coverage on the truth about a phenomenon by allowing limitation of approach to be offset by the strength of the other (Pilot & Beck 2014).

6.2.1 First Strand: Quantitative

The overview of the achievements of the quantitative strand objectives is discussed as follows:

- Identify factors that hinders the prevention of preterm labour in the selected hospitals of the Capricorn District, Limpopo Province;

- Explore the knowledge and practice of midwives and obstetricians in preventing preterm labour in the selected hospitals of the Capricorn District, Limpopo Province;

- The study revealed that on the side of mothers who participated in the study they had little or no information regarding preterm labour and premature delivery in general; and

- Develop and implement an effective strategy that will empower mothers who are at risk of preterm labour with the most relevant, clear information regarding preterm labour.

The numeric data have revealed that mothers with preterm labour presented to the hospital late in the active phase of labour, whereby the delivery of the neonate was imminent. Because most of the mothers were not '*tocolysed*' upon their arrival at the hospitals. Moreover, mothers with a history of preterm labour still booked late for ANC in the second trimester. These shows that mothers do not understand the level of risk they put their lives and neonates at.

The numeric data from the midwife's questionnaires has revealed that the hospitals does not do Community Outreach Programmes regarding the phenomenon. Therefore, it is important that pregnant mothers with or without a history of preterm labour/ preterm birth receive health education regarding preterm labour in general to help prevent subsequent or preterm labour in the selected hospitals.

The study revealed that midwives who participated in the study from all selected hospitals shared almost similar knowledge on the phenomenon, and that the main cause of preterm labour in their institutions is hypertension. However, during the period of study, the numeric data have shown that the majority of mothers had 'spontaneous preterm labour' and only few had preterm due to chronic hypertension, chronic Diabetes Mellitus, gestational hypertension and gestational Diabetes Mellitus.

8   Design a screening tool that will assist in recording the medical condition of the mother at the period of preterm labour/ preterm birth.

The screening tool will help the midwives to have an accurate monthly statistic of the possible leading cause of preterm labour in their institution that mothers presented with.

In summary, the objectives were achieved as follows:

8.1 All 77 self-developed questionnaires for mothers and 62 self-developed questionnaires for midwives were completed and returned. Based on data analysis the factors that hinders prevention of preterm labour were identified from the numeric data; and

8.2 Relations among the knowledge that mothers, and midwives had regarding the phenomenon was ascertained through the findings based on quantitative data

analysis. These relations were between the mothers and midwives from the selected hospitals.

The sampling strategy used was Convenience Sampling and Purposive/Judgmental Sampling that means sampling was done based on the judgement of the researcher regarding participants or representative of the study phenomena or who are especially knowledgeable about the question at hand. Validity and reliability of the questionnaire scale item were established based on pilot study, frequencies and as well as input by a panel of experts in research methodology to secure Content Validity.

Mothers who participated in the study were *primigravidas* and *multigravida*s with a history of preterm labour, previous miscarriages. These mothers were from local areas the selected hospitals and referring hospitals. A sample of 77 mothers completed all questionnaires and returned them to the researcher, and the response rate was 100%. Quantitative data analysis was done using IBM Statistical Package for Social Science version 25 for windows.

Midwives who participated in the study 98% of them were females and only 2% was a male. They obtained nursing qualifications such as 23% Diploma in Midwifery, 29% Diploma in Nursing and 48% degree in nursing. However, only 3% obtained a speciality qualification in Degree in Neonatology, 31% advance midwifery and 66% of midwives did not have any speciality qualification. A sample 62 midwives completed all the questionnaires and returned them to the researcher and the response rate was 100%

6.2.2 Second Strand: Qualitative

The objectives of qualitative second strand achieved as follows:

- Identify the factors that hinders prevention of preterm labour in the selected hospitals;
- Factors that hinder prevention of preterm labour were identified during the interviews, health professionals narrated that those mothers do not book early for Antenatal Care, some mothers do not book for antenatal at all. While some who are at risk continue to book late or do not book at all. Thus, making it difficult to prevent the occurrence or recurrence of preterm labour during the

antenatal period;

- Explore the knowledge and practise of midwives and obstetricians in the selected hospitals; and

- The knowledge and practise of midwives and obstetricians were explored and through narration the researcher has discovered that both professionals shared the similar knowledge and a slightly different of approach in managing the mother who present with preterm labour in the selected hospitals. However, the drug used for *tocolysis* is administered differently based on the obstetrician's preference.

6.2.3 Third Phase of the Study: Develop Strategies to Enhance Prevention of Preterm Labour in the Selected Hospitals

Several strategies were developed based on the finding of the first strand together with the second strand. Twenty interviews were conducted with the mothers from all three selected hospitals and about 11 interviews were conducted with the health professionals, these includes 7 midwives and 4 obstetricians from all selected hospitals, Capricorn District, Limpopo Province.

Findings from interviews with mothers was that the majority of them booked late in the second trimester, while others did not book at all and mothers who planned their pregnancy were few and booked early after missing their menstrual period. There were mothers who did not book for antenatal at all, their reasons where they did not know that they were pregnant. Mothers who attend Antenatal Care narrated that they did receive health education in short about preterm labour. Hence, they went late to the hospital when they had preterm labour, because they did not expect their neonates to be delivered at that period.

Other mothers mentioned that they received their health education through internet and at home from their parent. These shows the need for empowering pregnant women with information. The health professional mentioned that health education starts at the PHC, and mothers with high-risk conditions are to be referred to the hospitals in time. The majority of the obstetricians mentioned that the common cause of preterm labour are infections caused by the group-B *Streptococcus*. They emphasized that mothers who present with preterm labour and who are at risk of

preterm labour be screened for the group-B *Streptococcus* infections and results and mothers needs to be followed up.

6.3 Limitation of the Study

The study was conducted at selected hospitals in the Capricorn District, Limpopo Province. A limitation of the study was the research excluded mothers who are mentally impaired, who cannot speak/read/write English or Sepedi, and mothers who were admitted at high care. Therefore, the findings of the study cannot be generalized to other public hospitals that are situated in the Limpopo Province and other provinces in South Africa.

6.4 Recommendations of the Study

6.4 1 Recommendations for Midwives at PHC and Hospital

- Visit schools and community centres at least twice in a month to give information to the teenagers and woman of childbearing age;

- Midwives to empower the community through the radio station platform by giving various pregnancy related health education at least once a day during the week;

- Woman of childbearing age and pregnant mothers should be empowered with information related to pregnancy risk factors, importance of early antenatal booking;

- Midwives at the PHC should reinforce health education on each Antenatal Care visit;

- Midwives should screen all pregnant mothers for urinary tract infection and HIV on each antenatal visit, treat pregnant mothers and refer to the hospital when necessary.

- Midwives should provide counselling to mothers who delivered premature neonates before they can see their neonates in Neonatal Ward, to alley anxiety on the mothers.

- All midwives to attend customer service workshops on a monthly basis to help them to improve the services rendered in the health facilities.

6.4.2 Recommendations for Obstetricians at the Hospital

- Obstetricians to empower the community through the radio station platform by

giving various pregnancy related health education at least once a day during the week.

- Obstetricians to reinforce health education on each high-risk antenatal visit.
- Obstetricians to screen all mothers who are at risk of preterm labour for infections and obstetricians to follow up the results and treat the mother accordingly.
- Obstetricians to measure the cervical length of all mothers with recurrent preterm labour and do cervical cerclage when needed.
- Review and draw, a hospital protocol that will guide midwives and obstetricians on how to prevent, manage preterm labour and delivery in the selected hospitals.
- Refer all mothers who delivered premature neonates to the psychologist for counselling and support.

6.4.3 Recommendations for the Department of Health

- The Department of Health should hire enough staff so that quality care can be rendered to the pregnant woman at the PHC and hospital.
- Build other two more hospitals with neonatal facilities and few midwifery led units since the population around Mankweng hospital has grown and the midwives and obstetricians are overwhelmed with the work.
- Purchase enough obstetric ambulances, so that high-risk mothers are referred in time to the hospital.
- To develop the electronic database, to register all mothers who have a history of preterm labour, so that when they fall pregnant the database system will also help to identify them at the PHC and they would then be referred to the hospital in time.

6.5 Conclusion

This chapter concludes the research. The quantitative and qualitative objectives have been achieved in that the strategies to enhance prevention of preterm labour in the selected hospitals, of the Capricorn District, Limpopo Province were developed. The first research strand was the collection of quantitative data through which the respondents were given the questionnaires to complete. These respondents were

mothers with a history of preterm labour, mothers who delivered preterm neonates and midwives. The second strand was the collection of qualitative data through which the individual's interviews were held by the researcher with the mothers, midwives and obstetricians.

The recommendations were made based on the critical reflections, the research could benefit the Department of Health and mothers who are at risk of preterm labour. These recommendations could reflect the need to increase the awareness of preterm labour Community Outreach Programmes within the Limpopo Province.

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APPENDICES
Appendix A: Approval letter from the Faculty of Health Sciences

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: Kgagabi.letsoalo@ul.ac.za

DATE: 09 October 2019

NAME OF STUDENT:	MAKAKABA GM
STUDENT NUMBER:	201114261
DEPARTMENT:	NURSING
SCHOOL:	HEALTH CARE SCIENCES
QUALIFICATION:	MCUR

Dear Student

FACULTY APPROVAL OF PROPOSAL (PROPOSAL NO. FHDC2019/6)

I have pleasure in informing you that your MCUR proposal served at the Faculty Higher Degrees Meeting on the 09 October 2019 and your title was approved as follows:

Approved Title: "Development of Strategies to Enhance Prevention of Preterm Labour in the Selected Hospitals in Capricorn District, Limpopo Province".

Note the following:

Ethical Clearance	Tick One
Requires no ethical clearance	
Proceed with the study	
Requires ethical clearance (TREC) (apply online)	
Proceed with the study only after receipt of ethical clearance certificate	√

Yours faithfully

MR K.J Letsoalo
Chairperson

CC: **Supervisor:** Prof M.K Thopola

CO-SUPERVISOR:

UNIVERSITY OF LIMPOPO
FACULTY OF
HEALTH SCIENCES
2019 -10- 14
PRIVATE BAG X1106
SOVENGA 0727

Finding solutions for Africa

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University of Limpopo
Department of Research Administration and Development
Private Bag X1106, Sovenga, 0727, South Africa
Tel: (015) 268 3935, Fax: (015) 268 2306, Email: anastasia.ngobe@ul.ac.za

TURFLOOP RESEARCH ETHICS COMMITTEE

ETHICS CLEARANCE CERTIFICATE

MEETING:	**05 November 2019**
PROJECT NUMBER:	**TREC/514/2019: PG**

PROJECT:

Title:	Development of Strategies to Enhance Prevention of Preterm Labour in The Selected Hospitals in Capricorn District, Limpopo Province
Researcher:	GM Makakaba
Supervisor:	Prof MK Thopola
Co-Supervisor/s:	N/A
School:	Health Care Sciences
Degree:	Master of Nursing Science

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 C: Approval Letter from Limpopo Department of Health

LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

Department of Health

Ref   :   LP- 201912 - 011
Enquires   :   Ms PF Mahlokwane
Tel   :   015-293 6028
Email   :   Kurhula.Hlomane@dhsd.limpopo.gov.za

G M Makakaba

PERMISSION TO CONDUCT RESEARCH IN DEPARTMENTAL FACILITIES

Your Study Topic as indicated below;

Development of Strategies to Enhance Prevention of Preterm Labour in The Selected Hospitals in Capricorn District, 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

Head of Department   10/02/2020

                                      Date

Private Bag X9302 Polokwane
Fidel Castro Ruz House, 18 College Street. Polokwane 0700. Tel: 015 293 6000/12. Fax: 015 293 6211.
Website: http/www.limpopo.gov.za

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Appendix D1: Approval Letter from Mankweng Hospital

Restricted

LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

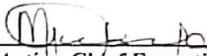## DEPARTMENT OF HEALTH
MANKWENG HOSPITAL

Ref: S5/3/1/2
Enq: Mohatli NT
Ext: 1017/1282
Email: terrence t.mohatli@dhsd.limpopo.gov.za

To: Ms. Mokakaba MG
Po Box 3853
Sovenga
0727

REQUEST FOR PERMISSION TO CONDUCT RESEARCH AT MANKWENG HOSPITAL: DEVELOPMENT OF STRATEGIES TO ENHANCE PREVENTION OF PRETERM LABOUR IN OUR HOSPITAL.

1. The above matter has reference.

2. This is to confirm that the CEO has granted permission to conduct research on "**development of strategies to enhance prevention of preterm labour in our hospital**".

3. The permission to conduct the research will be for a period of 1 year as stipulated on the approval letter from the Provincial Head Office.

4. Attached please find her application letter, approval from Provincial Office, ethics clearance certificate and research proposal.

Yours in service delivery

DEPARTMENT OF HEALTH
Mankweng Hospital

PRIVATE BAG X1117
SOVENGA 0727
Tel. 015 286 1000

LIMPOPO PROVINCE
13/03/2020

Acting Chief Executive Officer
Mrs. Kobola ME

Date

Private Bag X1117, SOVENGA, 0727 Tel: 015 286 1000 Fax: 015 267 0206
Houtbos Road, Sovenga
Restricted
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Appendix D2: Approval Letter from Seshego Hospital

LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

FROM   : Office of the CEO

TO   : Ms. Makakaba G.M

DATE   : 19 March 2020

RE: Development of strategies to enhance prevention of preterm labour in the selected Hospitals in Capricorn, Limpopo Province.

The above matter bears reference.

As authority has been granted by the Head of Department, this letter serves as permission to conduct such study in Seshego hospital from the 23 March 2020.

Kindly be informed that all rules stipulated in the letter from HOD should be satisfied from the date you commence with your study and or research.

Hoping you will find the above information in order.

Regards

Chief Executive Officer

Appendix D3: Approval Letter from Pietersburg Hospital

LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH AND SOCIAL DEVELOPMENT

ENQUIRIES: Mr MA POOPEDI   **DATE: 29 July 2020**

MANAGER: CLINICAL RESEARCH

PIETERSBURG/MANKWENG

 RESEARCH ETHICS COMMITTEE (PMREC)

ananiaspoopedi@gmail.com

REFERENCE	: PMREC 29 July UL 2020/G
RESEARCHER	: Ms GM Makakaba
	(PRINCIPAL INVESTIGATOR)
RESEARCH	: Post-graduate Research
DEPARTMENT	: Nursing Science

Project Title: Development of strategies to enhance prevention of preterm labour in the selected hospitals in Capricon District, Limpopo province.

Candidate: **Ms GM Makakaba**

Approval Status: Approved

NB: A yearly progressed report is required from the applicant until the project is finished.

Thank you In Advance

Dr W Holtshousen
Interim-Chairperson: Pietersburg/Mankweng Complex Research Ethics Committee
School of Medicine
University of Limpopo
REC 300408-006

Appendix E: Consent Form

INFORMED CONSENT:

I hereby confirm that the researcher has given me all the necessary information on this study, and I am satisfied. I understand the purpose of the study, risks and benefits and my rights as a participant in this study. Any question that I have has been answered to my certification.

I have been informed that any information will be kept confidential, and that the information will be anonymously developed into a research report that may be published. I am aware that the report and any publications from it will be shared with other departments. The researcher will keep me informed on the progress of the research if I wish to know.

I am aware that I can withdraw my participation from this study at any time and I willingly give my consent to participate in the study.

Participants Signature ……………………………………………………….

Researcher's name (Print)……………………………………………………………

Researcher's signature…………………………………………………………………….

Appendix F1: Questionnaire for Mothers

Section A: Demographic data

Tick in the appropriate box.
1. Age ....

2. Marital status

1.Single	
2.Married	

3. Occupation

1.Employed	
2.Unemplyed	

4. Educational level

1.Primary level	
2.Secondary level	
3.Tertiary level	
4.Never went to school	

5. Area of residence

1.Rural	
2.Township	
3.Suburb	

6. If the answer is unemployed on number 4, who is supporting you financially?

....

Section B: Accessibility
Tick in the appropriate box

7. How far are you staying from the clinic?

1.<10km	
2.11-20km	
3.21-30km	
4.>30km	

8. How far are you staying from the hospital?

1.10 km	
2.11-20km	
3.21-30km	
4.>31km	

9. How long do you wait for an ambulance?

1.1-2 Hours	
2.3-5Hours	

Section C: Obstetric data

Questions	Yes	No
10. This is my second pregnancy.		
11. I have being pregnant for more than 3 times but I do not have an alive baby at home.		
12. I have delivered through normal vaginal delivery.		
13. I have delivered through Caesarean Section.		
14. After delivery my baby was crying.		
15. After delivery my baby was not crying.		
16. I have one miscarriage.		
17. I have more than two miscarriages.		
18. I did one abortion.		
19. I did more than one abortion.		
20. My miscarriage was in the first trimester.		
21. My miscarriage was in the second trimester.		
22. My miscarriage was in the third trimester.		
When I had preterm labour, I was diagnosed with the following... 23. I was diagnosed with chronic hypertension.		
24. I was diagnosed with chronic Diabetes Mellitus.		
25. I was diagnosed with gestational hypertensive disorders.		
26. I was diagnosed with gestational Diabetes Mellitus.		
27. I was diagnosed with HIV.		
28. I had a 'spontaneous preterm labour'.		
29. I had an 'indicated preterm labour', because of an ill health.		
30. My pregnancy was planned.		
31. I was attending antenatal clinic when I had preterm labour.		
32. I was not attending antenatal clinic/unbooked when I had preterm birth.		

Section D: Lifestyle

Questions	Yes	No
33. I am underweight/Malnourished.		
34. I am overweight/Obese.		
35. I was smoking tobacco when I had my preterm labour.		
36. I used to drink alcohol when I had my preterm labour.		
37. Sometimes I do heavy duties at home.		
38. I was exposed to physical trauma on the day that I had miscarriage.		
39. I drank herbal medication on the day that I had preterm labour.		
40. I drank over-the-counter medication on the day that I had preterm labour.		

Section E: Knowledge

Questions	Yes	No
41. Do know how to count gestational weeks and compare them with months?		
42. Did you know that you can give birth before 37 weeks of gestation and the baby may survive?		
43. Do you know the true signs of labour?		
44. Do you know about the treatment of stopping preterm labour?		
45. Did you know that unprotected sexual intercourse can cause preterm labour?		

Questions	Options	Yes	No
46. When you were in preterm labour, you went straight to the?	1.Prophet		
	2.Sangoma		
	3.Clinic		
	4.Hospital		
47. After how long you sought for help when you were in labour?	1.1 hour		
	2.2-3 hours		
	3.3-5 hours		
	4.>6 hours		
48. Where did you deliver your premature baby?	1.Home		
	2.Clinic		
	3.Hospital		

Questions	Yes	No
49. Were you given medication to stop labour pains?		
50. When they discharge you in postnatal, were you given a follow update at gynaecology clinic for prevention of possible future miscarriages?		

Appendix F2: Questionnaire for Midwives

QUESTIONNAIRE FOR RESPONDENTS/MIDWIVES

Section A: Demographic Data

1. Age ……………

2. Gender

1.Male	
2.Female	

3. Nursing qualifications

1.Diploma in Midwifery	
2.Diploma in (General nursing, Community, Psychiatry) Midwifery	
3.Degree in (General nursing, Community, Psychiatry) Midwifery	

4. Speciality qualification

1. Advance Midwifery and Neonatal Nursing Science	
2. Diploma in Neonatal Intensive Care Nursing	
3. Degree in Neonatal Intensive Care Nursing	
4. None	

5. Work experience

1.< 1 year	
2.1-5 years	
3.6-10 years	
4.11-15 years	
5.16-20 years	
6.>21 years	

6. Current allocated ward

1.Antenatal Ward	
2.Labour Ward	

Section B: Main Causes of Preterm Labour

7. Inability of mother to count gestational age/incorrect gestational dates?

1.Yes	
2. No	

8. Inappropriate response to the lower abdominal pains?

1.Yes	
2.No	

9. Delay of ambulance arrival at the clinic or patient's home?

1.Yes	
2.No	

10. Delay in seeking medical help?

1.Yes	
2.No	

11. Obese pregnant mother?

1.Yes	
2.No	

12. Malnourished pregnant mother?

1.Yes	
2.No	

13. Can heavy duties at home/work setting cause preterm labour?

1.Yes	
2.No	

14. Does heavy alcohol consumption during pregnancy cause preterm labour?

1.Yes	
2.No	

15. Does frequent smoking during pregnancy cause preterm labour?

1.Yes	
2.No	

16. Does abdominal trauma increase the chance of having a preterm labour?

1.Yes	
2.No	

17. Does maternal stress cause preterm labour?

1.Yes	
2.No	

18. Does advanced maternal age cause preterm labour?

1.Yes	
2.No	

19. Pregnant women with untreated *vaginosis* can end up having preterm labour.

1.Yes	
2.No	

20. Pregnant women with untreated urinary tract infection can end up having preterm labour.

1.Yes	
2.No	

21. Can a pregnant mother who is HIV positive with high viral load have preterm labour?

1.Yes	
2.No	

22. Can a pregnant woman with untreated syphilis have a preterm labour?

| 1.Yes | |
| 2.No | |

23. Can antepartum haemorrhage cause preterm labour?

| 1.Yes | |
| 2.No | |

24. Does Preterm Premature Rupture of Membranes (PPROM) increase the chances of having preterm labour?

| 1.Yes | |
| 2.No | |

25. Does teenage pregnancy increase the chances of having preterm labour?

| 1.Yes | |
| 2.No | |

26. Does a short cervix predispose a pregnant woman to having a preterm labour?

| 1.Yes | |
| 2.No | |

27. Can a pregnant woman with *polyhydramnios* fall into preterm labour?

| 1.Yes | |
| 2.No | |

28. Does multiple pregnancy increase the chances of having preterm pregnancy?

| 1.Yes | |
| 2.No | |

29. Can severe anaemia cause preterm labour?

| 1.Yes | |
| 2.No | |

30. Does a history of preterm labour predispose a pregnant woman to have subsequent preterm labour?

| 1.Yes | |
| 2.No | |

Section C: Personnel Possible Causes of Preterm Labour
31. Disorientation of the midwife to the new work environment can further increase the chances of preterm birth?

| 1.Yes | |
| 2.No | |

32. Inexperienced midwife can increase the chances of preterm birth?

1.Yes	
2.No	

33. Does increased workload contribute to substandard examination of pregnant woman?

1.Yes	
2.No	

Section D: Midwives' knowledge

34. All pregnant woman diagnosed with hypertensive disorders can end up having preterm labour?

1.Yes	
2. No	

35. When hypertensive disorders are controlled, the mother can deliver prematurely.

1. Yes	
2. No	

36. A mother may deliver prematurely through Caesarean Section if the blood pressure is uncontrolled.

1. Yes	
2. No	

37. All pregnant woman diagnosed with gestational Diabetes Mellitus end up having a preterm labour?

1.Yes	
2. No	

38. Pre-rupture of membranes increase the chances of *Chorioamnionitis*.

1. Yes	
2. No	

39. Name the leading cause of preterm in your institution………………

40. I can *'tocolyse'* a preterm labour only when the pregnant woman is in which phase of labour?

1. Active phase	
2.Latent phase	

41. I cannot *'tocolyse'* a preterm labour when the pregnant woman is in which phase of labour?

1.Active phase	
2. Latent phase	

42. Which drug is recommended as the first regimen of *Tocolysis* in the maternity guideline?

1. *Aspirin*	
2. *Dexamethasone*	

3. *Adalat*	
4. *Indocid*	

43. Which drug is recommended as the second regimen of *Tocolysis* according to the maternity guideline?

1. *Salbutamol*	
2. *Indocid*	
3. *Adalat*	
4. *Dexamethasone*	

44. Do you follow the maternity guideline when you *'tocolyse'* a pregnant woman?

1. Yes	
2. No	

45. Can you successfully *'tocolyse'* a pregnant woman in preterm labour?

1. Yes	
2. No	

46. Does the hospital have continuous supply of *Tocolytic* treatment?

1. Yes	
2. No	

47. Cervical cerclage procedure can be done to prevent recurrent 'spontaneous preterm labour.'

1. Yes	
2, No	

48. Select the oral treatment that can be given to a pregnant woman with recurring preterm labour in your institution.

1. *Hydroxyprogesterone*	
2. *Aspirin*	

49. Does your facility offer Outreach Programme on the prevention of preterm labour?

1. Yes	
2. No	

50. How often does your facility offer Community Outreach Programme on the prevention of preterm labour?

1. Once a month	
2. Every 3 months	
3. Every 6 months	
4. Never	

Appendix G1: Interview Guide for Pregnant Women and Mothers Who Delivered Preterm Neonates

Central questions

Please, can you explain in your own words what preterm labour is and what can done to prevent it?

Probing questions

1. On the day that you had 'spontaneous preterm labour', is there anything that you remember that could have contributed to start the labour pains?

2. Are you getting enough support at home?

3. When you were in preterm labour pains, did the midwives or obstetricians give you any medication to stop labour pains?

Appendix G2: Interview Guide for Midwives

Central question

Please, can you describe what could be the common contributory cause of preterm labour that the pregnant women in your institution present with?

Probing questions

1. Are you familiar with the guidelines and protocols of preterm labour?

2. In your institution, how do obstetricians manage pregnant women with a history of preterm labour during antenatal?

3. What can be done to reduce the incidents of pregnant women presenting with preterm labour?

Appendix G3: Interview Guide for Obstetricians

Central questions:

Please share with me your thoughts about what can be the possible cause that contribute to the continuous occurrence of preterm labour because there are guidelines in place stating clearly how preterm labour can be prevented?

Please tell me more about what can be done to reduce the occurrence of preterm labour, specifically in patients who are being admitted in the facility that you are working at.

Probing questions

1. Are there enough resources available in the facility to assist in the prevention of preterm birth?
2. Which pregnant women are at risk of having preterm labour and these pregnant women are they aware of the management procedures available in your institution that can be done to prevent preterm labour?
3. How often do you admit pregnant women with preterm labour?

Appendix H: Letter of Confirmation from the Statistician

University of Limpopo
Research Administration and Development
Private Bag X1106, Sovenga, 0727, South Africa
Tel: (015) 268 3982, Fax: (015) 268 2306, Email: peter.mphekgwana@ul.ac.za

To: To whom it may concern

From: Mr MP Mphekgwana

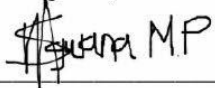Biostatistician

Date: 24 May 2021

Letter of Confirmation

Dear Sir/Madam

I hereby confirm that I have read the protocol and rechecked the analysis section of Ms.Gloria Meliddah Makakaba (201114261) titled "*Development of strategies to enhance prevention of preterm labour in the selected hospitals in Capricorn district, Limpopo province*"

Hope you find everything in order.

Kind Regards,

Mr Peter Mphekgwana, University Biostatistician

Appendix I: Letter confirmation from the independent coder

QUALITATIVE DATA ANALYSIS

MASTER OF NURSING SCIENCE
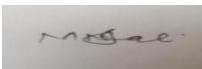
MAKAKABA GLORIA MELIDDAH

THIS IS TO CERTIFY THAT

Professor Martha Nozizwe Jali has co-coded 31 semi-structured in-depth interviews of mothers, midwives and obstetricians

For the study:

DEVELOPMENT OF STRATEGIES TO ENHANCE PREVENTION OF PRETERM LABOUR IN THE SELECTED HOSPITALS IN CAPRICON DISTRICT LIMPOPO PROVINCE

I declare that the candidate and I have reached consensus on the major themes reflected by the data during a consensus discussion. I further declare that data saturation was reached as evidenced by repeating themes

Prof M.N. Jali

Appendix J: Letter of Confirmation from the Editor

Mr MM Mohlake
University of Limpopo
Turfloop Campus
Private Bag x 1106
Sovenga
0727

16 November 2021

To Whom It May Concern

EDITING CONFIRMATION: Mr GM MAKAKABA's DISSERTATION

This letter is meant to acknowledge that I, MM Mohlake, as a professional editor, have meticulously edited the main dissertation of Ms Gloria Meliddah Makakaba (Student #: 201114261) entitled "Development of Strategies to Enhance Prevention of Preterm Labour in the Selected Hospitals in Capricorn District, Limpopo Province".

Thus I confirm that the readability of the work in question is of a high standard.

For any enquiries please contact me.

Regards

Mosimaneotsile M Mohlake
Freelance Professional Editor
(015) 268 2464
072 1944 452
<mosimaneotsile.mohlake@ul.ac.za>

Disclaimer: Subsequent alterations remain the responsibility of the author.

Appendix K: TRANSCRIPT for

Woman Participant Number: 16

Researcher: Hello mother

Participant: Hello

Researcher: How are you?

Participant: I am fine and you?

Researcher: I am fine, my name is Gloria Makakaba a student from the University if Limpopo.

Participant: Okay

Researcher: I am doing masters and we are expected to do researcher alright?

Participant: Yes

Researcher: My topic is related to mothers who delivered premature babies, alright.

Participant: Yes

Researcher: The researcher would like to know what the causes of preterm labour could be because were the researcher is working there are a lot of pregnant women who had preterm birth and still deliver prematurely at that hospital.

Participant: Yes

Researcher: Therefore, the researcher thought that maybe by doing research we could identify the causes and develop the strategies that we can use to prevent or reduce the figures of pregnant mothers with preterm birth.

Participant: Yes, reduce.

Researcher: The University of Limpopo, Department of Health and the hospital management approved the researcher's study.

Participant: Yes

Researcher: The information that we are going to share during the interview, if you agree the researcher will compile a report anonymously. The researcher will not ask for your name during the interview and your names will not appear on the research report. The research report will be submitted to the University of Limpopo, and they will publish it.

Participant: Yes

Researcher: The Department of Health may adopt the recommendations developed from the study.

Participant: Yes

Researcher: Maybe other women might benefit from the recommendation, and we might have a reduced figure

of Participant: So that we don't come back

Researcher: Yes mother.

Participant: Yes

Researcher: I was asking for your consent to do an interview with you?

Participant: No problem, we can continue.

Researcher: Ok, its fine. Thank you. If you feel like you want to withdraw during the interview

Participant: Yes

Researcher: You are welcome to do so; you have the right to stop alright mother.

Participant: Alright.

Researcher: Yes. How old are you mother?

Participant: 32 years old

Researcher: Are you working?

Participant: (sigh) I am self-employed.

Researcher: Okay, at home how many children do you have?

Participant: Should I count my little sister's children or mine only?

Researcher: Let me say the pregnancies that you had from the first one.

Participant: Alright, I had three pregnancies.

Researcher: At which year was the baby born?

Participant: In 2012, if am not mistaken.

Researcher: How did you deliver?

Participant: I delivered normally

Researcher: You delivered normally; the baby is alive at home.

Participant: The baby is well and alive.

Researcher: Okay.

Participant: Yes

Researcher: When you were attending the antenatal clinic with your first pregnancy

Participant: Yes

Researcher: eh, at how many months did you start?

Participant: Because I was too excited, I started very early.

Researcher: Okay

Participant: After finding out, because I was busying the pregnancy test, I went to start.

Researcher: Okay, I hear you mother. The second baby

Participant: Yes

Researcher: Were you attending an antenatal clinic when you were pregnant for the second time?

Participant: Yes, same applies to the second one. I went very early

Researcher: Okay

Participant: At the clinic, they called an ambulance and they already told me that the baby is dead.

Researcher: Okay

Participant: I had to come to the hospital to deliver.

Researcher: Yes

Participant: …because I can't not be pregnant with a dead baby. The cause was unknown.

Researcher: Okay, when you were attending, at how many months was the baby delivered?

Participant: It was 6-7 months

Researcher: Okay, I hear you.

Participant: …but the baby's weight was big enough to be buried at home.

Researcher: Alright.

Participant: The baby was big.

Researcher: When you were attending the antenatal clinic, were you not referred to the hospital due to elevated blood pressure, was everything normal?

Appendix L: TRANSCRIPT Midwife

Participant Number: 5

Researcher: Good morning sister

Participant: Morning

Researcher: My name is Gloria Makakaba I am a student at the University of Limpopo. I am currently doing Masters in Nursing, today I came here in your institution to collect dat. Before I continue, I will be using the audiotape to record the whole interview in order for me to transcribe everything that we may share during the interview and the record will be kept in a safe place. I would like to do an interview with you sister, would you please give me a consent to continue hold the interview with you.

Participant: Its fine, continue.

Researcher: Ok. The title of my study is the development of strategies to enhance the prevention of preterm labour in the selected of Capricorn district which include Mankweng hospital, Polokwane and Seshego. That is where data will be collected in those three institutions. So, the aim of the study is to develop the strategies to enhance the prevention of preterm labour. And then, the objectives of my study is to identify the factors that hinders the prevention of preterm of labour to explore the knowledge and practice of obstetricians and midwives in those three institutions and also to develop the strategies to enhance the prevention of preterm labour. The main reason why we are doing the study is to improve with the management and the prevention of preterm labour since there are high figures of neonates who are being admitted because of preterm labour.

Participant: In this case we are looking at saving mothers lives so ended up doing mostly the caesarean section to preserve both the life of the mother and the baby.

Researcher: Yes

Participant: But mainly you'll find that caesarean sections are done to preserve the life of the mother, whereas the baby will be delivered prematurely.

Participant: Eh, what else? Eh what are those main causes, I can't remember some of them.

Researcher: Ok, moving to another question are you familiar with the guidelines and the protocols of preterm labour?

Participant: Yes

Researcher: Ok, eh could you please share with me how obstetrician manage a pregnant woman with a history of previous preterm labour during antenatal

Participant: Come again

Researcher: Ok

Participant: The management

Researcher: …of how the obstetricians manage the woman who present with preterm labour during antenatally, how do obstetricians manage them?

Participant: First of all, through the history taking

Researcher: Yes

Participant: …the woman is advised that if they see, what can I say eh pre-rupture of membranes

Participant: You monitor the fetal heart rate to see weather the baby is fine

Researcher: Yes

Participant: …and then you also monitor the mother.

Researcher: Yes

Participant: You check the mother for everything, weather the mother is anaemic she will be transfused, you look for the comorbidities so that you treat for whatever that need to be treated.

Researcher: Ok

Participant: And then the doctors will weigh the pros and cons weather to tocolyses or not to tocolyses to progress with labour or not to progress with labour.

Researcher: Ok, let's say a woman present to you in a latent phase of labour, what do you do? What is it that you do, what is the management thereof of that woman who comes to your institution while in the latent phase of labour prematurely?

Participant: Like I said you monitor both fetal and maternal wellbeing to check the fetal heart and then you can tocolyses when the doctor said let's tocolyses, depending on the what do they call it? The bishop score.

Researcher: Yes

Participant: You tocolyses, you give the steroids, you monitor both maternal and fetal, check the HB, other comorbidities you give the treatment. Weather is PROM you must check, test the urine to see if the infection is there chorioamnionitis

Researcher: Yes

Participant: and then you give the steroids and the like

Researcher: Ok, I heard you speaking of tocolyses what is it that you do when you tocolyses a woman and who should tocolyses a woman?

Participant: We take it from the doctors who would have weigh the pros and cons to see this woman is likely to go into preterm labour

Researcher: Yes

Participant: Them they will either prescribe tocolyses which we know in our institution we use are using the Adalat/Nifedipine.

Researcher: Ok, Is the Nifedipine always available in your institution in order to assist in tocolysing these pregnant who come with

Participant: Always available we don't run shortage of stock of Nifedipine, is always ready

Researcher: Eh in your institution I heard you saying that you wait for the doctor to prescribe, are there no advance midwives who perhaps are able to just initiate the treatment or its always the case were you have to wait for the doctor first to see the woman and prescribe medication. Are you not bound to give medication maybe if there is an advance midwife available?

Participant: Mm, yes am one of the advance midwives but you know that there are some of the duties or the responsibilities that you take as midwife

Appendix M: TRANSCRIPT
Obstetrician Participant Number: 02

Researcher: Good after doctor

Participant: Afternoon

Researcher: How are you?

Participant: Am well thanks and, how are you?

Researcher: Am ok, my name is Gloria Makakaba am a student at the University of Limpopo, am currently doing Masters in Nursing. So today I would like to do an interview with you, my topic is development of strategies to enhance the prevention of preterm labour in the selected hospital of Limpopo in Capricorn district which includes Mankweng, Seshego and Polokwane hospital. I will be recording the interview so that I will be able to transcribe everything that we would share during the interview. I would like you to give a consent to proceed and hold an interview with you.

Participant: Ok, no problem you can proceed.

Researcher: Ok thank you. Eh the first question that I have here with me is that can you please share with me your thoughts about what can be done, eh what can be the possible cause that contribute to the continuous occurrence of preterm labour because currently there are guidelines in place stating clearly how preterm labour can be prevented?

Participant: Ok, uhm well with regards to possible causes it would be very difficult to pinpoint exactly what is the cause

Participant: Is just that we have not really discovered what could be the cause

Participant: I think that is a challenge, so for me the possible causes it's a multifactorial we cannot really say 100% this or 100% that it's a lot of factors combined.

Researcher: Oh ok. Ok doctor I heard you speaking about environment as one of the contributing factors, can you please elaborate on that

Participant: So, the population that we work with its mainly people that are form poor socio- economic status and that's why I am saying that environment plays a factor because its mostly people that are not working

Participant: So, that's why am saying that environment also contributes.

Researcher: Ok, thank you for that. Moving to another question can please tell me more about what can be done to reduce the occurrence of preterm labour specifically in patients who are being admitted in the facility that you working at?

Participant: Ok, so specifically in the facility that am working at

Participant: Them you anticipate that this is a risk for a preterm labour.

Researcher: Yes

Participant: So, in my setting I think that in every patient that comes we need to do a full work-up

Participant: I think that is what can be done in the setting that we working in

Researcher: Yes

Participant: …to actually try and reduce the occurrence of preterm labour.

Researcher: Ok, while we still on that point are enough resources available in the facility to assist in preventing the preterm birth and labour?

Participant: They do but at the lesser rate compared to you know those with a low socio-economic status. So, I think if the government can be aware of such things and do door to door to check on the families and maybe also to educate these woman

Participant: Or is just lower abdominal pain cause every pregnant woman have lower abdominal pains if we can do thorough workups and get the results quicker that can help to prevent.

Researcher: Ok, the question I think you've answered it already but let me ask you, which pregnant woman are at risk of having preterm labour and these pregnant women are they aware of the management procedures available in your institution that can be done to prevent the preterm labour?

Participant: But I still feel like it's not enough, so the rate is still high

Researcher: Alright, thank you doctor for the information that you shared with me I believe it will assist me a lot.

Participant: Yes, well done. All the best.