



Midwifery Practice Guidelines to Promote Quality Care of Preterm Babies in Resource-Limited Obstetric Units of Limpopo Province, South Africa

by

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DECLARATION

I, **Thivhulawi Malwela**, declare that this dissertation entitled “**Midwifery Practice Guidelines to Promote Quality Care of Preterm Babies in Resource-Limited Obstetric Units of Limpopo Province**” hereby submitted for the degree **Doctor of Philosophy (PhD)** at the **University of Venda** has not been submitted previously by me at this or any other institution, that it is my own work in design and in execution, and that the sources that I have cited have been indicated and acknowledged by means of complete references.

Thivhulawi Malwela :

Date Signed :

DEDICATION

This work is dedicated to my family, that is, my husband, Mr N.E. Malwela, my boys, Nndondeni Goodness and Muphulusi Joshua.

ABSTRACT

Preterm birth is an unresolved health issue; globally it is the largest contributor to mortality among children under 5 years of age. Worldwide, approximately 9.6% of all births are preterm which the World Health Organization (WHO) recognizes as one of the top ten causes of neonatal deaths. The alarming rates of preterm births and deaths may be directly linked to the shortage of resources and an inadequate database of midwifery care guidelines for midwives in South Africa resulting in poor maternal care in public health. This study sought to develop midwifery practice guidelines to promote quality care of preterm babies in resource-limited obstetric units of the Limpopo Province of South Africa.

The convergent parallel mixed method was used, explorative, descriptive and contextual qualitative design were run concurrently with the descriptive quantitative approach. For the qualitative design, non-probability purposive sampling was used to select midwives and managers from Limpopo Province. In-depth one-to-one interviews were conducted with 11 midwives and 4 managers. Tesch's eight steps of open-coding was used to analyze qualitative data. Trustworthiness was ensured through credibility, confirmability, dependability and transferability. For the quantitative approach, 31 midwives and 24 managers completed the Likert scale questionnaire.

The non-probability method was employed to select midwives and managers to make up a sample size of 55 participants. Reliability and validity of the instrument was ensured through extensive literature review and a pilot study. Data were analyzed with the IBM Statistical Package for the Social Sciences (SPSS) version 23.0. Both quantitative and qualitative data analysis yielded three themes as follows: the role of midwives in reduction of preterm births and deaths in obstetric units; challenges faced by midwives whilst executing their role during preconception, antenatal, labour and

puerperium period; support needed by midwives during provision of maternal and neonatal care to reduce preterm births and deaths. In the discussion of the findings, qualitative findings were supported by quantitative findings.

The WHO model (PICOS & GRADES) was adapted in the development of the guidelines. The group then validated the guidelines using a closed-ended checklist to verify whether the guidelines were congruent with practice. The results were analyzed through simple descriptive statistics where the data were summarized using frequency distributions. The results indicated that the guidelines were applicable to practice and may need slight modification to suite the institutional needs prior operationalization.

Keywords: infant morbidity and mortality, limited resources, midwifery practice guidelines, neonatal care, quality care.

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LIST OF ABBREVIATIONS

ACMM	The American College of Nurse-Midwives
ACOG	American College of Obstetricians and Gynaecologists
AGREE	Appraisal of Guidelines Research & Evaluation
ANC	Antenatal Care
ANNP	Advanced Neonatal Nurse Practitioner
ART	Antiretroviral Therapy
AZT	Azidothymidine/Zidovudine
CEOs	Chief Executive Officers
CM	Certified Midwife
CNM	Certified Nurse Midwife
CN	Certified Nurse
CTG	Cardiotocogram/Cardiotocography
BANC	Basic Antenatal Care
CPAP	Continuous Positive Airway Pressure
DHIS	District Health Information System
DOH	Department of Health
DOTS	Directly Observed Treatment, Short Course
ESMOE	Essential Steps in the Management of Obstetric Emergencies
FDC	Fixed-Dose Combination, e.g., of Antiretroviral Drugs
ELISA	Enzyme-Linked Immunosorbent Assay
GDG	Guideline Development Group
GRADE	Grading of Recommendations, Assessment, Development and Evaluation Essential Management of Obstetric Emergencies
HAART	Highly Active Antiretroviral Therapy
HBB	Helping Baby Breath
HIV	Human Immunodeficiency Virus
ICM	International Confederation of Midwives
ICUs	Intensive Care Units

IMCI	Integrated Management of Childhood Illnesses
IMPAC	Integrated Management of Pregnancy and Child Birth
KMC	Kangaroo Mother Care
LINC	Limpopo Initiative for Neonatal Care
MDGs	Millenium Developmental Goals
MCWH	Maternal, Child and Women's Health
MNCWH	Maternal, Newborn, Child and Women's Health
MOU	Midwifery Obstetric Unit(s)
MUAC	Mid-Upper-Arm Circuference
NICE	National Institute for Health and Care/Clinical Excellence
NICUs	Neonatal Intensive Care Units
NUU	Neonatal Unit
NN	Neonatal Nurse
NMC	Nursing and
NRF	National Research Foundation
NVP	
NPMMC	National Perinatal Morbidity and Mortality Committee
ODI	Overseas Development Institute
PEP	Perinatal Education Programme
PICOS	Population, Intervention, Comparator, Outcomes and Study Methodology/Design
PHC	Primary Health Care
PMTCT	Prevention of Mother-To-Child Transmission
P-PROM	Preterm Premature Rapture of Membranes
RCOG	Royal College of Obstetricians and Gynaecologists
RDS	Respiratory Distress Syndrome
RPR	Rapid Plasma Reaction
QUAL	Qualitative
QUAN	Quantitative
SANC	South African Nursing Council
SBAAs	Skilled Birth Attendants

SBAR	Situational-Background-Assessment-Recommendation
SPSS	Statistical Package for the Social Sciences
STIs	Sexually Transmitted Infections
TB	Tuberculosis
TBAs	Traditional Birth Attendants
UK	United Kingdom
USA	United States of America
USAID	United States Agency for International Development
UTIs	Urinary Tract Infections
WHO	World Health Organization

CHAPTER 1

STUDY OVERVIEW

1.1 Introduction

Preterm birth is a public and a global obstetrics health issue occurring in more than 7% of births, accounting for around 27% of perinatal mortality and a substantial amount of morbidity. The prevalence remains a worrying problem as it has not changed over the last 20 years and has been cited as arguably the most studied topic in obstetrics. Although the associated mortality and morbidity have decreased due to advances in neonatal care, every preterm birth occurring before 32 weeks of gestation remain a particular concern since the majority of mortalities (84%) and the morbidities occur in this group (Watson *et al.*, 2012). However, the study explored the factors that are leading to continuous increase in the prevalence of preterm birth and death despite several studies which were meant to improve the preterm birth and death outcomes.

According to Ricci (2013), midwives play a critical role in reducing preterm labour and birth to improve pregnancy outcomes and their infants, and early detection of preterm labour is currently the best strategy to improve the outcomes. A midwife is responsible for providing primary prevention that includes diagnosis and treatment of infections, cervical cerclage, progesterone administration, identification of medically- and pregnancy-induced conditions and referral to the medical practitioner. Secondary prevention includes administration of antibiotics and tocolytics (Davidson *et al.*, 2012). On the other hand, a midwives' roles in the care of preterm babies include promoting optimal breathing patterns by giving oxygen and resuscitation, promoting thermoregulation through maintenance of normal thermal regulation, promoting

adequate nutrition and fluid balance, preventing infection, preventing complications, managing pain and promoting parental coping mechanisms (Ricci, 2013). Therefore, the researcher wanted to come up evidence from the midwives that would form part of the recommendations to improve quality life of preterm babies in the limited resources of Limpopo province.

The fact that a midwife is the expert in normal pregnancy is not new and a midwife is the first point of contact for women accessing maternity services. For almost all pregnant women, the midwife is the first channel for care throughout pregnancy, labour and the postnatal period. Birth has moved from a private social home location to a setting in hospital. Midwives need to strengthen their skills in organizing and leading local services for women and families. A midwife's focus should be to enable all women and their families to have a positive and safe experience of pregnancy, birth and early parenting (Cook, 2016). Limpopo Province lacked midwife generated guidelines, less or very little practicing midwives pursued or were engaged in research to improve midwifery practice. In addition, there was limited number of midwives trained for additional specialty in the units to manage preterm properly. Therefore, the researcher sought to develop midwifery practice guidelines to promote provision of quality care for preterm babies within resource-limited obstetric units of the Limpopo Province, South Africa.

1.2 Background to the Study

Premature birth occurs before the completion of 37 weeks of pregnancy; when born before 28 weeks the baby is extremely preterm (Harrison, 2008). Davidson, London & Ladewig (2012) defined preterm birth as a birth that occurs between 20-37 weeks of gestation. There is an increase in the preterm birth globally and approximately 14.9 million babies were born in the year 2010 (Blencowe *et al.*, 2013). Preterm birth is an unresolved global health issue and the largest contributor to under-5 mortalities (Belizán *et al.*, 2013).

Worldwide, approximately 9.6% of all births are preterm which the WHO recognizes as one of the top ten causes of death. In Thailand, the rate in 2009 was 11.4%, which is considerably higher than the global average of 7.6% (Wisansoonwong, 2012). A review of the epidemiological evidence revealed that rates of preterm birth have not declined over the past 30 years despite increases in available medical treatments and technology. In developed countries, the incidence of preterm birth has been increasing steadily over the past two decades (Wisansoonwong, 2012). In the United States of America (USA), for example, the incidence of preterm birth as a percentage of live births gradually increased from 11% in 1995 to 12.8% in 2007.

Before the twentieth century, the rates of preterm birth in Europe ranged from 5.5% to 11.4% and between 2003 and 2009 the rate increased slightly to 7.1% of all live births (Wisansoonwong, 2012). The incidence of preterm birth as a percentage of live births in Australia during the period 2001-2009 varied between 7.8 and 8.7 and has remained at this figure. However, the Northern Territory where a large part of the population is indigenous women who are the most socioeconomically disadvantaged group, the preterm birth rate was 13.1% in 2009 (Wisansoonwong, 2012).

The highest preterm birth rates were in low-income countries (11.8%) and lower middle-income countries (11.3%), although many high-income countries, including the United States (12.0%) and Austria (10.9%), also had high preterm birth rates. When evaluating the data in terms of region, rather than country, the highest preterm birth rates in 2010 were in South Eastern Asia, South Asia, and sub-Saharan Africa, accounting for more than 60% of all preterm births. An estimated 9.1 million live births (12.8% of live births) were preterm. The 10 countries with the highest numbers include Brazil, the United States, India and Nigeria, implying that preterm birth is truly a global problem. Of the 11 countries with preterm birth rates of over 15%, all but two are in sub-Saharan Africa. In the poorest countries, on average, 12% of babies are born too soon compared with 9% in higher-income countries.

Within countries, poorer families are at higher risk, indicating that resources influence the rate of preterm birth (Blencowe *et al.*, 2013). India, China and Nigeria are the leading countries which contribute 60% of total preterm births globally, and these are the countries with less resources, including human, medical equipment, materials and supplies (Blencowe *et al.*, 2013). Of every four newborn babies who die in the world, one dies in India. The annual burden of 0.76 million neonatal deaths in India is the highest for any country. The three major causes of neonatal deaths are complications from preterm birth (35%), infections (33%), and intrapartum-related conditions or birth asphyxia (20%)(Blencowe *et al.*, 2013).

Almost all asphyxia-related deaths and the majority of prematurity-related deaths happen within the first week of life, while more than half of infection-related deaths occur after the first week of life (Zodpey *et al.*, 2014). Preterm birth is the major cause of death and a significant cause of long-term loss of human potential among survivors all around the world.

Complications of preterm birth are the single largest direct cause of neonatal deaths, responsible for 35% of 3.1 million deaths a year, and the second most common cause of under-5 deaths after pneumonia (Blencowe *et al.*, 2013). In addition, Aleman *et al.* (2013) indicated that preterm birth is the underlying cause of 35% of infants' deaths in the first year of life and substantial short and long-term morbidity in the survivors. Preterm birth is the main cause of 4 million neonatal deaths each year worldwide, 99% of which occurs in low or middle-income countries (Aleman *et al.*, 2013)

According to Waiswa *et al.* (2010), the Millennium Developmental Goal (MDG) 4 (*Reduce by two-thirds, between 1990 and 2015, the under-five mortality rate*) will not be achieved without significant reduction in newborn mortality rates, hence decreasing deaths related to preterm birth is crucial in reducing overall neonatal mortality. Increasing preterm birth could significantly militate against the achievement of MDGs.

A study conducted in Uganda indicated a challenge to reduce preterm birth and saving lives of preterm babies as lack of health facilities with enough space to nurse preterm babies, lack of equipment and drugs and other supplies, only 7 out of 16 hospitals had resuscitation kits and 7 out of 16 had weighing scales and in all hospitals, there were no neonatal units meant for the sick (Waiswa *et al.*, 2010). All babies, including preterm were hosted in one maternity unit full of visitors, making it difficult to prevent infection of the preterm babies. None of the facilities practiced kangaroo mother care (KMC) due to lack of rooms (Waiswa *et al.*, 2010).

In South Africa, the incidence of premature birth is increasing of which 59% occurred at the community health care or district level and has the highest perinatal mortality rate (Sellers *et al.*, 2012). The National New Born Care Report indicated that there is still an increased rate of preterm births, about 5 237 deaths occurred in 2012-2013 due to immaturity and complications of prematurity (Table 1.1).

Table 1.1: National statistics for preterm birth in South Africa

Province	Preterm birth
Eastern Cape	234 841
Free State	94 139
Gauteng	414 840
Kwa-Zulu Natal	381 262
Limpopo	254 249
Mpumalanga	153 206
North West	115 828
Northern Cape	43 093
Western Cape	149 198
<i>Source:</i> Rhoda & Pattinson (2014)	

1.3 Role of Midwives in Provision of Care to Promote the Quality of Life of Preterm Babies

According to the WHO global report *Born Too Soon*, a midwife's role to reduce preterm birth and save the lives of preterm babies includes pre-conception care which is any intervention provided to women of childbearing age, regardless of pregnancy status or desire, before pregnancy, to improve health outcomes for women, newborns and children (Blencowe *et al.*, 2012). Several international authors indicated that during preconception, midwives prevent preterm birth through teaching the mothers about the risk of falling pregnant at ages below 18 years and above 35 years, inform the mother of the importance of a well-balanced diet and the use of micronutrient supplement in preparation of pregnancy. Mothers are encouraged to visit a doctor or nurse to discuss their conception and to get genetic counselling, get supplements, especially iron, folic acid and vitamin C, as these substances are important to prevent anaemia, congenital anomalies and prevent infections that later lead to preterm births. The mothers will be screened for any medical conditions and infection that can pose threats to conception, pregnancy and birth. Mothers will be advised to avoid unplanned pregnancies, child spacing using family planning that will also assist to avoid complications, including preterm births and preterm babies. Above all, they will be educated on the importance of attending antenatal care (ANC) clinics, birth planning, and classes to prepare for motherhood (Davidson *et al.*, 2012; Fraser & Cooper, 2003; Blencowe *et al.*, 2012). The results from this study indicated shortage of staff making it difficult for these midwives to execute their role according to their scope of practice, hence increased preterm birth and death.

Australia and New Zealand are the countries which are performing well in the prevention of preterm birth and saving the lives of preterm babies (Kildea *et al.*, 2010). According to the standards of maternity care in Australia and New Zealand, all providers of health services should aim to optimize the health of women of reproductive age, recognizing the importance of prior health on a subsequent

pregnancy. Every visit of a woman of reproductive age to their medical practitioner should be an opportunity to plan for pregnancy or contraception, if required. Pre-pregnancy advice should include the following: interim contraception (if needed), nutrition (particularly iron and folic acid supplementation), exercise, weight targets, sexual health, smoking, alcohol, illicit drugs, advice regarding necessary vaccinations (prior to or during pregnancy) and Pap smear (Walker & Pecoraro, 2014).

In Australia and New Zealand, routine ANC focuses upon maintaining and improving health and general well-being, emphasising the importance of a healthy diet, exercise and avoiding smoking, alcohol and illicit drugs as well as establishing patterns of healthy living for the entire family, continuing to screen for the management of pregnancy complications through vigilant history, clinical examination and appropriate investigations throughout the pregnancy according to college guidelines and management of any pregnancy complications as they arise (Walker & Pecoraro, 2014). Harrison (2012) indicated that midwives need to prevent the occurrences of preterm births. If not possible, they need to be well prepared to treat the neonate after birth. He continued to explain the roles of a midwife after birth, which include prevention of hypothermia by keeping the baby warm at a temperature of 37°C, maintenance of room temperature of 21°C, promote early feeding and monitor glucose to prevent hypoglycemia and prevention of infection as the infant is immature and has a low resistance to infection.

Midwives need to encourage mothers to breastfeed their babies, foster confidence and show mothers the importance of breastfeeding their preterm babies as other mothers become stressed by seeing that their babies are too weak to suckle. They also need to teach mothers how to express milk and use cup feeding until the babies are strong enough to suckle from the breast. Midwives also need to teach the mother how to transit from cup feeding and continue breastfeeding at home after discharge (Ronan, 2013).

The roles of a midwife in saving the lives of the preterm babies include the management of neonatal hypothermia. Hypothermia is defined as an abnormally low body temperature of under 36.5°C. This is a risk factor for newborn survival in low- and middle-income countries, particularly when associated with preterm birth and severe infections. Many neonatal deaths, particularly those related to severe infections and prematurity, are preventable with relatively easy interventions to keep babies warm. WHO proposes a “warm chain”, or a series of interlinked procedures to minimize the risk of hypothermia in newborns, including: warming the delivery place, immediate drying, skin-to-skin care, early and exclusive breastfeeding to promote close warming contact with the mother and provide energy to generate heat, postponing bathing, appropriate clothing and bedding, and placing mother and baby together. However, even seemingly simple strategies such as skin-to-skin care are not consistently practiced in resource-limited settings (Lunze *et al.*, 2014).

Farrell (2007) showed that midwives are the most closely involved with the care of the pregnant women and need to play a major role in prevention of preterm births and reduce the infant mortality in South Africa. Therefore, midwives need to execute their role during ANC through patient education, human immunodeficiency virus (HIV) counselling and the use of evidence-based model of ANC (Farrell, 2007). During intrapartum care, they must ensure correct monitoring of foetal heart rate, effective partogram (PTG) use, and correct management of the second stage of labour and proper management of HIV-infected women. During the neonatal stage, they need to ensure that resuscitation equipment is available and in good working condition, apply good resuscitation skills, keep the baby warm, proper identification of neonates at risk and timely referral to another level of care (Farrell, 2007). In contrary, the findings from this study revealed that Limpopo Province lacked equipment's and those available were not in good working condition, hence substandard care which resulted into increased preterm birth and death in Limpopo Province.

1.4 Resources Versus Quality Care to Reduce Preterm Births and Improve the Quality of Life of Preterm Babies

According to the WHO global report *Born Too Soon*, lack of resources like skilled midwives, few health facilities in urban areas and lack of facilities in rural areas, many women, especially in low socioeconomic states like South East Asia and the African continent are not receiving such services, and preconception care plays a great role in reducing preterm birth and preterm babies. Neglecting the role of preconception in such countries resulted in increases in the rate of preterm birth and preterm babies (Blencowe *et al.*, 2013)

Australia is considered one of the safest countries in the world in which to give birth or to be born. However, there are wide disparities in maternal and infant health outcomes for Aboriginal and Torres Strait women in remote and rural areas of Australia when compared to other Australians (Kildea *et al.*, 2010). This area is characterized by poverty, increased burden of diseases, unemployment, poor housing and reduced access to services. Due to fewer resources, this region experiences a problem of prematurity like other poor countries. Therefore, there is a relationship between resources and saving lives of preterm babies (Kildea *et al.*, 2010). The British Association of Perinatal Care recommended that a neonatal unit need to be allocated one 3 junior trainees, Advanced Neonatal Nurse Practitioner (ANNP), senior trainees 4-8, and 1 specialist doctor. Augmentation can be a second trained doctor, second trained Advanced Neonatal Nurse (ANN) practitioner or resident consultant. The nurse patient ratio should be 1:1 to provide excellent care to the preterm neonates (Jones, 2014).

According to the Federal Republic of Nigeria Ministry of Health (2011), almost 40% of women in Nigeria give birth with just a relative or no attendant present at all, while 39% of deliveries are with a SBA doctors, nurse/midwives or auxiliary midwives. Traditional birth attendants (TBAs) assist 22% of births. The proportion of home births

is 90% in the North West and 87% in the North-East zones of the country. The quality of care in health facilities is often low. Knowledge, availability and use of the PTG are limited. Basic requirements are often lacking, such as power supply, water, equipment and drugs. Although a 24-hour service is available in most tertiary and secondary health facilities, very few primary health centres in the country offer round-the clock services. Only 4% of public health facilities meet standards most in wealthier, urban areas.

Less than 2% of women nationally deliver by Caesarean section, pointing to an unmet need for emergency services. Emergency care for new-borns is even more lacking. Only 10% of midwives are trained in neonatal resuscitation, and fewer are trained in the immediate care of premature babies. Emergency care for new-borns is even more lacking. Only 10% of midwives are trained in neonatal resuscitation, and fewer are trained in the immediate care of premature babies.

There is an increase in premature births in Nigeria. There were 3 760 live births over the 5-year study period out of which 636 were preterm births, giving a prevalence rate of 16.9%. Spontaneous preterm births occurred in approximately 57% of preterm births while provider-initiated births occurred in 43%. The preterm birth rate increased from 9.8% in 2009 to 17.1% in 2013 after peaking at 23% in 2012 (Iyoke *et al.*, 2014). The proportion of preterm births due to provider-initiated births increased about 4-fold between 2009 and 2013. Nigeria is in position number three in top 10 countries with the highest rate of preterm births. However, these trends correlate with lack of resources as Nigeria is one of the African countries where resources are a problem (Blencowe *et al.*, 2013).

In addition, a study in Uganda indicated that health facilities lacked capacity for preterm care in terms of infrastructure, practices, equipment, drugs and other supplies. No health unit had a special room for the care of preterm babies. Preterm

babies were hosted in maternity rooms with many visitors, thus making it difficult to control infection. No rooms were available for skin-to-skin (KMC) to keep babies warm. The other problem was that due to lack of skilled midwives, TBAs were assisting the mothers with preterm babies, leading to poor hygiene and lack of supervision to the nursing mothers. As a result, these babies did not survive (Waiswa *et al.*, 2010)

In South Africa, a survey was conducted in 145 care providing neonatal units. A third of district and regional hospitals did not have bassinets. Two thirds of district hospitals did not have critically required equipment for the resuscitation of neonates. Forty eight percent (48%) of regional and 80% of district hospitals did not have oxygen blenders to render control of concentration of administered oxygen. A quarter of district hospitals did not have pulse oximeters. One third of regional hospitals did not have equipment to monitor vital signs. More than a quarter of the regional hospitals did not have equipment for respiratory support (DOH, 2008-2010).

In the Limpopo Province there is no staff establishment, be they doctors and nurses dedicated to the neonatal units (*National Perinatal Morbidity and Mortality Committee Report* (NPMMC), 2008-2010). There are only 862 doctors and 1 744 vacant posts for doctors in the Limpopo Province and 81 specialists with 323 vacant posts (NPMMC 2008-2010). The alarming rates of preterm births and deaths of preterm neonates can be linked to shortage of resources. Health facilities experiencing the most alarming rate were district hospitals (Table 1.2). The results of the study confirmed this as 100% of participants alluded to lack of equipment's and shortage of staff and trained midwives for example neonatal nurses. Lack of midwifery guidelines and proper referral system also contributed to delayed referral and proper management of preterm babies hence increased morbidity in this group. Therefore, the researcher sought to develop midwifery practice guidelines to promote the provision of quality care of preterm babies within the ambit of limited resources in the obstetric units of the Limpopo Province, South Africa.

Table 1.2: National statistics for preterm birth in Limpopo Province

District	Preterm birth
Capricorn	491 690
Mopani	39 077
Sekhukhune	41 968
Vhembe	56 746
Waterberg	20 878
Rhoda & Pattinson (2014)	

1.5 Practical Policy Guidelines that Promote Quality of Life of Preterm Babies

A study conducted in the USA reveals that the use of progesterone is backed by the guidelines from the American College of Obstetricians and Gynaecologists (ACOG) and the Society for Maternal-Foetal Medicine that recommended offering progesterone prophylaxis to women with the greatest risk for preterm birth (Ohio Department of Health, 2013). Progesterone is an evidence-based treatment that could benefit more at-risk women than current usage numbers reveal. The challenge is the fact that the few evidence-based interventions which could reduce the burden of preterm birth are often not used, especially in resource-limited settings (Belizán *et al.*, 2013).

Nigeria is one of the African countries with the policies needed to reduce new-born mortality with affordable cost. Inadequate funding and stewardship of resources at all levels hampers the performance of the Nigerian health care system. The Nigerian health system is relatively rich in human resources compared to many other African countries. However, there is inequitable distribution of staff to offer maternal, new-born and child health services. The key interventions to save new-born lives are mostly possible through the existing health system and will prevent the deaths of mothers and older children, but coverage remains very low (Federal Republic of

Nigeria Ministry of Health, 2011).

South Africa has a Basic Antenatal Care (BANC) handbook that is aimed at improving maternal health, improving the health and survival of the baby, providing the pregnant woman with information on warning signs during pregnancy and how to respond to bad habits such as drinking alcohol and smoking, nutrition, contraception, feeding her infant and HIV counselling and testing (Pattinson, 2005). Midwives can detect and treat anaemia, other chronic diseases such as tuberculosis (TB), or complications of HIV infection and other sexually transmitted infections (STIs).

BANC can also improve the nutritional status of the woman. It can significantly improve the outcome of the unborn baby. It can allow detection and treatment of some of the maternal infections that are dangerous to the infant, of some maternal medical conditions such as diabetes mellitus that are harmful to the infant, and of complications arising in pregnancy such as pre-eclampsia or poor intrauterine growth of the infant. Treatment and intervention may help to prevent preterm birth and death of babies (Pattinson *et al.*, 2005). The *Saving Babies Eighth Report* on perinatal care in South Africa that summarizes the report of each province indicating how each province is doing to reduce prenatal morbidity and mortality. The report indicates avoidable factors by skilled birth attendants (SBAs) and outlines the recommendations to be followed to reduce child mortality. Hopefully, this will save the lives of new-born babies, including preterm babies (Pattinson, 2013). The *National Perinatal Morbidity and Mortality Committee Report* outlines the interventions of preventing spontaneous preterm birth and reducing death in low birth weight infants. In these guidelines, all SBAs, including midwives, must take the full history of pregnant women to identify women at risk who will benefit from cervical cerclage, diagnoses and treat infections like HIV, urinary tract infections and giving of maternal steroids to prevent respiratory distress syndrome (RDS) in preterm babies (Department of Health (DOH), 2008-2010).

Midwives can reduce death in low birth weight infants by appropriate management of RDS through oxygen therapy, surfactant replacement, continuous positive airway pressure (CPAP). In addition, keeping the baby warm, monitoring glucose, enforcing strict aseptic techniques to prevent neonatal infection, promoting breastfeeding, providing KMC and many more are recommended procedures (DOH, 2008-2010). Despite all these guidelines, preterm births are increasing, and midwives are failing to reduce death arising from the complications of preterm births. The barriers to implementation of the recommendations include old pediatrics units which lack capacity and proper equipment, lack of skilled clinical personnel, including midwives and pediatricians (DOH, 2008-2010). The results confirmed this argument because most units had guidelines, but due to many barriers amongst others shortage of staff and lack of midwives with speciality the guidelines were not utilized properly.

1.6 The Impact of Preterm Birth

Preterm birth complications are a major cause of death and a significant cause of long-term loss of human potential among survivors all around the world. Complications of preterm births are the single largest direct cause of neonatal deaths responsible for 35% of the world's 3.1 million deaths a year, and the second most common cause of under-5 deaths after pneumonia. In almost all high- and middle-income countries of the world, preterm birth is the leading cause of child death (Blencowe *et al.*, 2013). Preterm births account for one-third of the five million neonatal deaths that are estimated to occur worldwide every year. About 24% of all neonatal deaths are the result of health complications following preterm birth. In South-East Asia, the major cause of neonatal death is preterm birth and preterm birth is therefore a significant cause of short-and long-term morbidity. This morbidity increases the demand for neonatal intensive care units (NICUs) to care for the large and increasing number of preterm babies surviving with anomalies such as blindness, neurological impairment and chronic respiratory disease.

As these diseases become more common, the rate of preterm birth increases the monetary burden on the country, both in terms of health costs and in the lost working capacity of the long-term survivors and their careers (Wisanskoonwong, 2012). According to the *South African National Department of Health Saving Babies Report* (2014), there were 5 237 neonates who died due to asphyxia, prematurity and infections, all these newborns were weighing ± 1000 g, indicating that these were the preterm babies (Pattinso & Rhoda, 2014).

1.6.1 The Impact of Preterm Birth on Health and Development

The incidence of hospitalization is higher for those who are born prematurely than for those born at term. The highest rate of hospitalization is associated with the earliest preterm births. Babies who were born before 28 weeks (birth weights less than 1 500 g) have high rates of severe disabilities including cognitive and neurological impairment. These preterm babies may also have physical and mental impediments to their growth and well-being. They can experience poor development because of neonatal or postnatal growth failure (Wisanskoonwong, 2012). The implications of being born too soon extend beyond the neonatal period and throughout the life cycle. Babies who are born before they are physically ready to face the world often require special care and face greater risks of serious health problems, including cerebral palsy, intellectual impairment, chronic lung disease, and vision and hearing loss. This added dimension of lifelong disability exacts a high toll on individuals born preterm, their families and the communities in which they live (Blencowe *et al.*, 2012).

1.6.2 The Impact of Preterm Birth on Families

Having a preterm baby is an emotionally distressing event for the parents. Parenting a preterm baby is particularly stressful because the parents need to negotiate their parental rights with staff in the intensive care unit as well as manage their parenting roles at home. Higher rates of psychological stress, depression, marital problems, and

stressful daily life have been linked with parenting preterm babies. For underdeveloped countries, these stressors are multiplied due to limited resources, poverty, the absence of health insurance and limited health facilities, particularly early childhood clinics (Wisansoonwong, 2012).

1.6.3 The Social and Financial Cost of Preterm Birth

There are direct and indirect social costs related to the delivery of preterm babies. Direct costs involve the value of the resources needed for treatments such as obstetric care, medical services, and educational and developmental services. Indirect costs include the loss of social opportunities and the loss of potential human resources due to preterm morbidities and mortalities. The financial costs of preterm births include maternal and caregiver costs.

Maternal costs are those associated with purchasing prenatal and delivery services, and the cost of medical interventions aimed at extending the gestational age until the survival of the newborn is possible. Caregiver costs include the cost of time for traveling to take care of the preterm infant, and the cost of visiting the hospital every day. Furthermore, the birth and re-hospitalization of preterm babies increases the financial cost. For example, the financial cost of preterm births in the US in 2005 was \$26.2 billion or \$51,600 per preterm baby.

Maternal delivery costs were \$1.9 billion. Moreover, the cost of special educational services for preterm infants with cerebral palsy, mental retardation, hearing loss and visual impairment was \$1.1 billion or \$2,200 per person (Wisansoonwong, 2012).

Blencowe *et al.* (2012) concluded in the report *Born Too Soon* by indicating that preterm birth is not a single condition, but a single outcome due to multiple causes. Hence, there will not be a single solution, but rather there must be an array of solutions that address the various biological, social, clinical and behavioural risk factors that

result in preterm birth. This report identifies risks for preterm birth and the solutions needed to reduce these risks across the continuum; yet for many of these risks, there are no effective solutions. Important research priorities have also been highlighted.

A strategic research approach is needed to understand why babies are born preterm or as stillbirths; how to identify women at risk, even in adolescence; how to close the global survival gap for premature babies; and how to reduce disability rates in the preterm population and improve their quality of life. Important research themes can be summarized across the research pipeline of description, discovery, and development and delivery science, showing the dual agenda of preventing preterm birth and addressing the care and survival gap for babies born preterm. For the preterm prevention research agenda, the greatest emphasis is on discovery and descriptive research, with a shorter timeline to impact at scale. Therefore, the researcher sought to develop midwifery practice guidelines to promote the provision of quality care of preterm babies within limited resources in the obstetric units of the Limpopo Province, South Africa.

1.7 Problem Statement

According to the *Saving Babies Report 2011*, the Limpopo Province is experiencing an increasing rate of premature births as well as morbidity and mortality due to immaturity of the neonates. During student accompaniment, the researcher observed that there was lack of proper handwashing due to lack of soaps and water. There was also poor maintenance of warmth to preterm babies due to shortage of incubators and radiant warmers and damaged wall thermometers in the preterm units. According to the maternal and neonatal dashboard indicators, the Limpopo Province had 3 097 newborn babies under 2 500 g. In the Vhembe district, according to the maternal and neonatal dashboard indicators, 2 826 newborn babies are under 2 500 g (Vhembe District Health Information System (DHIS), 2015).

In one of the hospitals in the Vhembe district, the maternity case register statistics of January-June 2014, showed that ± 70 premature infants were admitted in nursery and 90% of these premature babies died. The seriousness of this crisis was further echoed by the Senior Manager of Maternal and Child Health Directorate at the 2014 annual graduation at the Limpopo College of Nursing, that there is an alarming rate of preterm births in the obstetric units of Limpopo Province. According to the *National Perinatal Morbidity and Mortality Report (2008-2010)*, most of these premature births could be avoidable and most of causes are health care provision related issues.

A study called *Sustainability of Midwifery Practice Within the South African Health Care System*, indicated that there is lack of research that promotes policies in the midwifery practice and poor data base and health information system of midwives in South Africa resulting in poor maternal care in the public health institutions. Therefore, this study sought to develop midwifery practice guidelines to promote the provision of quality care for preterm babies in the face of limited resources in the obstetric units of the Limpopo Province.

1.8 Purpose of the Study

- 🔦 The purpose of the study was to develop midwifery practice guidelines to promote provision of quality care of preterm babies within limited resources in the obstetric units of the Limpopo Province.



1.9 Objectives of the Study

The objectives of the study were to:



1.9.1 Phase 1

- 🔦 Explore the role of midwives in the provision of quality care of preterm babies within limited resources in the obstetric units of Limpopo Province,

South Africa.

-  Identify the challenges faced by midwives in the provision of quality care of preterm babies in the obstetric units of the Limpopo Province.
-  Assess the support provided by the manager in the provision of quality care of preterm babies in the obstetric units of Limpopo Province.

1.9.2 Phase 2

-  Develop midwifery practice guidelines that promote the provision of quality care to preterm babies despite the limited resources in the obstetric units of the Limpopo Province.
-  Validate the developed midwifery practice guidelines.

1.10 Significance of the Study

The significance of a study is a form of conveying the importance of the problem and for different audiences that may profit or benefit from reading and using the study (Creswell, 2014). The study will serve as a comparator, meaning that the study findings will be compared with current clinical guidelines to develop and adapt the midwifery practice guidelines which are effective and applicable to the real world of midwives in resource-limited obstetric units of Limpopo Province. The study findings will be of value to:

1.10.1 Maternal Child and Women Health Directorate

The developed midwifery practice guidelines deduced from this study may be particularly implementable in antenatal clinics, intrapartum care, postnatal care, child and women health care in the obstetric units throughout the Limpopo Province. The guidelines may assist midwives to provide preconception counselling to women from the age of 18 years and older to enable them to prepare well before conception to

avoid preterm births. This may lead to healthy babies and children, relieving the burden on the budget of the Maternal Child and Women Health (MCWH) Directorate.

1.10.2 Midwifery Education

The findings of this study may be used to guide midwifery educators in teaching holistic women-centred care to midwifery students. The guidelines may be incorporated into the curriculum, assisting educators in providing training in such a way that students will be able to integrate theory with clinical practice, guide students on how to work collaboratively to produce a midwife who will correlate theory with practice and assist in the reduction of preterm birth and promote quality of life of preterm babies.

1.10.3 Midwifery Practice

The developed midwifery practice guidelines may provide midwives with an approach that will address the problem of preterm birth and saving the lives of preterm babies. Guidelines may be disseminated for approval by the obstetric unit heads and be adopted as a protocol to be used by all midwives in the province.

1.10.4 Midwifery Research

The recommendations from this study may be extended to or tested in other provinces to validate if these midwifery practice guidelines can be implemented in other contexts. This study will provide a blueprint for research for other midwives who want to make a difference to the alarming preterm birth rate, as well as saving preterm babies. Other researchers may identify gaps and put forward novel and amended guidelines.

1.10.5 Policymakers

The recommendations from this study may assist the policymakers to come up with evidenced-based care guidelines that will prevent preterm birth, improve care of the

preterm babies and promote quality life for the preterm babies in Limpopo Province and the greater South Africa.

1.11 Conceptual Framework of the Study

1.11.1 Scope of Practice of a Registered Midwife in South Africa

In this study, the researcher integrated the scope of practice of a registered midwife as outlined by the South African Nursing Council (SANC) Regulation No. R. 2598 of 30 November 1984 (SANC, 1984). The reason for choosing this framework was the scope of practice that guides the registered midwives in South Africa and SANC that acts as a quality assurance body that regulates midwifery practice in South Africa and protects the public from harm (SANC, 2005). The scope entails scientifically based acts or a procedure which applies to midwifery practice which relate to mother and child during pregnancy, labour and puerperium.

The SANC described the competencies of a midwife that provide maternal and child care that would promote quality life of mother and child starting from antenatal, labour and puerperium (SANC, 1984). A midwife diagnoses the health needs and facilitates optimal physical and mental health of the mother and the baby. This is achieved through identification and prevention of diseases related to pregnancy, labour and puerperium and promotion of health and family planning as well as monitoring the state of the mother and baby (SANC, 1984). In addition, the midwife prevents complications by managing pregnancy labour and puerperium and referring the mother to a doctor if the complication is above her scope. The midwife will then administer medication and treatment prescribed by the doctor to prevent such complications to save the life of both mother and baby (SANC, 1984). In this way, a midwife will be providing quality care that promotes quality life of preterm babies.

The midwife further assists in operative diagnostic and therapeutic acts for the mother

and baby, coordinate the health care programme with other health professionals, advocates for the mother and baby to get optimized quality care they need (SANC, 1984). This is done to provide the woman with quality care that includes physical, psychological and spiritual needs during antenatal labour and puerperium, thus promoting quality life of newborn babies including preterm babies.

1.11.2 Application of the Scope of Practice of a Registered Midwife to the Study

The SANC Scope of Practice Regulation No. R. 2598 describes the competencies of a midwife that provides maternal and child care that include promoting quality of life of mother and child starting from antenatal, labour and puerperium (SANC, 1984). Midwives will be expected to apply midwifery-related theories or models relevant to care given to pregnant women from conception till postnatal period and their new-born babies. These include respecting the views of the pregnant woman, being a partner in her care throughout all stages, coaching mentoring and supporting her, minimizing complications and promoting quality care from preconception, ANC, labour and puerperium. Midwives also need to strive to practice within their level of competence, advocate for patients, protect the human dignity and integrate appropriate midwifery standards to prevent neonatal deaths due to complications of prematurity that promote quality of life of preterm babies and saving lives.

In addition, the midwives diagnose the health needs, facilitate optimal physical and mental needs of the mother and the baby. This is achieved through identification and prevention of diseases related to pregnancy, labour and puerperium and promotion of health and family planning, as well as monitoring the state of the mother and baby (SANC, 1984). Likewise, the SANC scope of practice holistic care and use the scientific nursing process is an assertive, problem-solving approach to the identification and treatment of patients' problems. It provides an organizing framework for the practice of nursing and brings the knowledge, judgement, and actions that

nurses bring to action care. The midwife will then administer medication and treatment prescribed by the doctor to prevent such complications to promote quality of life of both mother and babies (SANC, 1984).

The midwives would apply learned midwifery theories and models in the promotion of comfort and hygiene, reassuring the mother, promotion of antenatal and postnatal exercises, promotion of rest and sleep, maintenance of fluid, and electrolyte and acid-base balance, provision of gases and analgesics, maintenance of nutritional status, monitoring of vital signs of the mother and baby, promoting proper elimination patterns and promotion of breastfeeding. All this care is directed at prevention of complications and deformities, thus promoting a high quality of life for unborn babies, including premature new-born babies' (SANC, 1984). The midwife further assists in operative diagnostic and therapeutic act for the mother and baby, coordinate the health care programme with other health professional, advocates for the mother and baby to get optimized quality care they need (SANC 1984). For proper advocacy, midwives need to have proper or well-defined channels of communication of sharing patients' information in the midwifery obstetric units, respect other team members' opinion and accept the autonomy and each other's private space to provide holistic care that will promote quality of life of preterm babies.

To provide quality care to preterm babies, a midwife needs to practice within the scope of practice as described above, advocate for patients, protects the human dignity and integrates appropriate midwifery standards to prevent neonatal death due to complications of prematurity and, thus, promote quality of life of preterm babies, follow the developed evidence based national guidelines and policies updated by other health care professionals which assist in the provision of quality care of preterm babies. In executing her scope of practice, the midwife would be expected to execute the regulation relating to the conditions under which registered/enrolled midwives may carry on their profession, i.e., Regulation No. R. 2488 of 1990. The conditions set out

include having all equipment like 2 x 1000 ml of intravenous infusion and equipment to perform and suture episiotomy, first- and second-degree tears, equipment and material to resuscitate the neonate to provide quality care to the new-born babies, including preterm (SANC, 1990).

The midwife advises the pregnant women to do blood tests, establish previous pregnancy-related complications as well as labour and puerperium, and in case of primigravida do thorough assessments to classify as high or low risk and avoid complications like preterm birth. Where possible, midwives should see the pregnant woman at least 5 times before delivery to promote health and save the life of the new-born baby and foster proper development of the foetus and normal growth of the baby (SANC, 1990). During labour, the midwife shall establish true labour monitoring of the woman from first stage of labour until the delivery of the new-born, making sure that she does not leave the woman alone, especially in active phase of labour to ensure safe delivery of the baby and avoid complications leading to the loss of the new-born baby (SANC, 1990). During puerperium, the midwife shall not discharge the mother and baby and provide for at least 5 days to make sure that both are in a satisfactory condition before going home. The midwife shall promote breastfeeding as breast milk would provide the preterm baby with a well-balanced nutrition to promote growth and reduce risk to infections and other illnesses related to low immunity, and hence, promote quality of life of new-born as well as preterm babies (SANC, 1990).

Guidelines for Maternity Care in South Africa emphasize the holistic care by midwives in provision of quality maternal child and women health care (MCWH) to reduce various complications, including premature births and deaths. The guidelines emphasize the importance of first antenatal visit by all women to ensure a healthy mother and baby throughout. During this visit, the midwives need to take history, family, previous and current history that may have implication on the pregnancy (DOH, 2015). Physical examination that include mid-upper-arm circumference (MUAC) to

determine nutritional status and rule out obesity which is associated with pre-eclampsia that can result in preterm birth, malnutrition which is associated with anaemia and preterm birth (DOH, 2015).

Estimation of gestational age by establishing last normal menstrual period of the woman, measuring of symphysis fundal height, palpation and ultrasound to assist midwife to monitor proper growth of the foetus and estimate the correct expected date of delivery and prevent preterm labour and delivery (DOH, 2015). In line with holistic care, the guidelines prescribe the essential screening to be routinely done on all pregnant women and this will assist midwives to identify the deviation from normal and provide quality care to promote quality MCWH care. Screening includes blood for ABO blood group incompatibility, Rhesus (Rh) factor, STIs and other infections which, if not managed, can lead to preterm birth and death.

Provision of the routine treatment like ferrous sulphate, folate and calcium as well as 5 doses of tetanus toxoid (DOH, 2015). The guidelines further emphasize holistic midwifery care which include information giving. The midwife needs to teach the woman on the five common danger signs which are vaginal bleeding, draining liquid, reduced foetal movements, abdominal pain and severe headache which pose a danger of preterm birth and death. Additional information will include delivery plan, selfcare, new-born child infant care (DOH, 2015).

1.11.3 World Health Organization Model for Developing Guidelines

The researcher selected the WHO guidelines which used PICO and GRADES as outlined in the handbook of guidelines development WHO (2012). These included (PICO), identification of priority questions and critical outcomes, retrieval of the evidence, assessment and synthesis of evidence, formulation of recommendations, and planning for the dissemination, implementation, and impact evaluation and updating of the guideline. The researcher employed the *Grading of Recommendations*

Assessment, Development and Evaluation (GRADE) approach. The process also included the constant reviewing and updating following the new evidence from researches.

1.12 Definitions of Concepts

1.12.1 Limited Resources

This a restricted amount of inputs needed by business such as staff, finances, production facilities, and raw materials (WHO, 2016). In this study, limited resources mean limited supply of equipment, shortage of staff and old dilapidated infrastructures.

1.12.2 Midwife

According to SANC, a midwife is a person trained and registered under the nursing Act No. 33 of 2005 to support and assist the mother and baby, to achieve and maintain optimum health during pregnancy, all stages of labour and puerperium (SANC, 2005). In this study, a midwife will mean a trained registered nurse midwife who provides care to promote quality of life of preterm babies in the obstetric units.

1.12.3 Midwifery Practice

This is a collective body of knowledge and skills focused on families of women and newborns during pregnancy and childbirth that exists in all health care settings that define midwifery actions within legal-ethical boundaries (Dippenaar & da Serre, 2012). In this study, midwifery practice will mean provisioning of quality care to preterm babies.

1.12.4 Obstetric Units

According to the guidelines for maternity care in South Africa (2015), obstetric units include clinics, level 1-3 hospitals, and community health centers. In this study,

obstetric units will refer to district hospitals with the neonatal care unit (DOH, 2015).

1.12.5 Preterm Baby




If a baby is born before the completion of the 37th week of gestation, regardless of birth weight, the baby will have a problem of immaturity in all systems (Davidson *et al.*, 2012). In this study, a preterm baby will mean a baby born before the pregnancy reaches week number 37.

1.12.6 Quality Care

This is a service that meets the requirements of consumers and assists them to meet their health needs within contextual boundaries of a health care system (Sellers *et al.*, 2012). In this study, quality care will mean maternal services that promote quality life of preterm babies.

1.13 Research Design and Methodology

In this study, the researcher used the convergent parallel mixed method design because of the following advantages:

-  It allows the use of multiple worldviews or paradigms for greater assortment of divergent views and perspectives and made researcher alert to possibilities than issues.
-  It combines inductive and deductive reasoning. It allowed the researcher to develop a life skill programme and instrument to measure its effectiveness based on the qualitative information. The design was straightforward to describe, implement and report the phenomena.
-  It provides strength that offsets the weaknesses of both qualitative and quantitative design and therefore has a potential to provide better

inferences. Inclusion of quantitative component allowed triangulation and makes it acceptable to quantitative biased audience.

The accessible population comprised of midwives and managers who were working in maternity units of Limpopo Province. Purposive sampling was used to select midwives and managers who were willing and had 12 months or more working experience in the maternity units of the district hospitals of the Limpopo Province. The researcher was the main data collector in-depth one-to-one interviews was conducted with 13 midwives and 2 managers to give a total of 15; a semi-structured interview guide was used. Trustworthiness constructs and criteria of Lincoln & Guba's model were considered for this study this included credibility, transferability, confirmability and dependability. A quantitative approach was used to collect data from 31 midwives and 24 managers from selected district hospitals. Ten (10) midwives and 3 managers participated in the validation of data. Validity and reliability was ensured by intensive literature review and appropriate statistical analysis.

1.14 Ethical Considerations

Permission was obtained from the University of Venda Health, Safety and Research Ethics Committee, the Limpopo Province Department of Health, and the Capricorn, Vhembe and Sekhukhune district health departments. Informed consent was obtained from the respondents. The respondents were advised that participation was voluntary and that they could withdraw at any time if they felt threatened, without punishment or victimization. The details are described in Chapter 3.

1.15 Dissemination of the Study Findings

The research report containing the developed guidelines were submitted to the Limpopo Province Department of Health. The results will be submitted to peer-reviewed journals for publication. Oral presentations or posters may be presented at organized conferences.

1.16 Layout of the Study Chapters

Chapter 1: Overview of the Study

Chapter 2: Literature Review

Chapter 3: Research Design and Methodology

Chapter 4: Results and Discussion

Chapter 5: Development of Midwifery Practice Guidelines

Chapter 6: Recommendations, Conclusions and Limitations of the Study

1.17 Summary

Chapter 1 provided an overview of the study, which included the introduction and background, problem statement, purpose and objectives of the study, research questions, research design and method, and ethical considerations. The relevant concepts were defined as used in this study. Chapter 2 reviews the literature in the context of the study undertaken.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

A literature review refers to the process of analyzing and synthesizing sources to come up with a picture of what is known and not known about the situation (Grove *et al.*, 2014). The literature review puts the study into context, shows the path of prior research and links the current project to the former, assists the researcher after data collection to differentiate between findings and existing knowledge and how the findings could advance the existing knowledge (Delpont *et al.*, 2011).

Scope of literature reviewed

Literature reviewed were mainly from the developed countries for example United Kingdom, united states and Australia. Developing countries such as south Africa, China and India. Sub-Saharan countries such as Nigeria, Malawi and Tanzania.

Methodology and Strategy used

Most article reviewed were from the mixed methods designs. The researcher used integrative literature review methodology wherein empirical and theoretical literature were summarized to provide more comprehensive understanding of the health care problem. The methodology allowed diverse methods that played an important role in evidence-based practice in midwifery care.

Examples of data bases used

Data base	Coverage	Website
Ebscohost	Multi-disciplinary	http://search.ebscohost.com
Health Source: Nursing/Academic Edition	Medical Disciplines	http://search.ebscohost.com
Science Direct	Multi-disciplinary with strong emphasis on the sciences	http://sciencedirect.com
Sage	Multi-disciplinary	http://online.sagepub.com







Sampling criterion

Policies, guidelines, standards, models and theoretical frameworks were purposively selected to form themes as this is the common sampling methodology used in integrative review method.

Inclusion criterion

All full articles written in English from the year 2002 to 2018 were included in the study. Eight (8) textbooks, 8 world health reports, 8 South African national and district health reports and 146 full text articles formed part of the review.






Therefore, this chapter presents identified themes on the scholarly work seeking to obtain a comprehensive picture of knowledge to obtain clues on the methodology and refining the research instrument. Furthermore, it is aimed at critically appraising and reflecting on the topic as well as refining some parts of the study and the search focused on the following aspects that would assist in the development of guidelines pertaining to:

-  Standards for quality maternal and neonatal health care;
-  The role of midwives in provisioning of quality care of preterm babies during ANC, intrapartum, resuscitation and postnatal care in the obstetric units;
-  The challenges faced by midwives in provisioning of quality care of preterm babies during ANC, intrapartum, resuscitation and postnatal in the obstetric units;
-  Managers' support provided to midwives during ANC, intrapartum, resuscitation and postnatal care within limited resources in the obstetric units of the Limpopo Province, South Africa;
-  Midwife-centred practice guidelines in other countries as well as South Africa, which may assist midwives to provide quality care and reduce preterm births and save the lives of preterm babies; and
-  The theoretical frameworks underpinning the study.

2.2 Standards for Quality Maternal and Neonatal Health Care

Standards are those morals, ethics, habits established by authority, custom, or an individual as acceptable. Standards set the platform and direct the essential elements needed to meet the health needs of society. The midwife needs to apply the



professional knowledge, competence willingly and remain accountable of her acts and omissions, as well as practice her nursing based on the art and science of nursing and midwifery as directed by professional norms, values and philosophies of nursing and midwifery. Quality nursing and midwifery care is based on:

-  Adequate knowledge and skills;
-  Comprehensive, holistic patient care;
-  Timeous and accurate/complete recording;
-  Therapeutic environment; and
-  Team work.

Standards underpins each nursing practice, hence promoting the quality of care provided (SANC, 1984). Therefore, each country has a statutory body that establish and regulate the standards for nursing care as outlined below:

2.2.1 Global Midwifery Standards to Prevent Preterm Births and Reduce Risks of Neonatal Deaths

The International Confederation of Midwives (ICM) provided the global midwifery practice with the competencies that assist midwives to provide quality maternal and neonatal care to mothers and their babies as follows:

-  Midwives should have the requisite knowledge and skills from obstetrics, neonatology, the social sciences, public health and ethics that form the basis of high quality, culturally relevant, appropriate care for women, newborn's, and childbearing families.
-  They should also provide high quality, culturally sensitive health education

and services to all in the community to promote healthy family life, planned pregnancies and positive parenting.

- 🔦 Midwives should also provide high quality ANC to maximize health during pregnancy and that includes early detection and treatment or referral of selected complications.
- 🔦 Furthermore, they should provide high quality, culturally sensitive care during labour, conduct a clean and safe birth and handle selected emergency situations to maximize the health of women and their newborns.
- 🔦 In addition, midwives should provide comprehensive, high quality, culturally sensitive postpartum care for women. They also offer high quality, comprehensive care for the essentially healthy infant from birth to two months of age.
- 🔦 Lastly, midwives should give a range of individualized, culturally sensitive abortion-related care services for women requiring or experiencing pregnancy termination or loss that are congruent with applicable laws and regulations and in accord with national protocols (Adegoke *et al.*, 2013).

The competencies outlined above enable midwives to provide quality care to mothers and their babies throughout, including preterm. The SANC scope of practice R. 2598 also outlines similar competencies which include diagnoses of health needs and facilitating the optimal physical and mental health of the mother and the baby. This is achieved through identification and prevention of diseases related to pregnancy, labour and puerperium and promotion of health and family planning as well as monitoring the state of the mother and baby (SANC, 1984). The study findings revealed that the midwives were able to execute their role, but limited resources resulted into substandard care that made the rate of preterm birth and death remain

unchanged.

2.2.2 WHO Recommendations on Interventions to Improve Preterm Birth Outcomes

World Health Organization (WHO) in their 2015 guidelines developed 10 recommendations to improve premature birth outcomes (Table 2.1). Although the direction of evidence and value of preference were rated low, use of resources was not effective because there is less resource intensive, balance of benefit outweighed the disadvantages, and recommendation direction and overall strength of the recommendations were rated very high. Therefore, WHO notices the improvement in the countries where the recommendations were implemented (WHO, 2015).

2.2.3 American Midwifery Standards


The American College of Nurse-Midwives (ACNM) standards for the practice of quality midwifery states that midwifery care must be provided by a qualified, that is, certified nurse midwife (CNM) and certified midwife (CM) licenced by ACNM.

Table 2.1: World Health Organization 2015 guidelines and recommendations to improve premature birth outcomes (WHO,2015).

Recommendation & Description	
1.	Advocates for administering antenatal corticosteroids like dexamethasone, contraindication of steroids need to be considered for example women with chorioamnionitis or any evidence of infection are not given corticosteroids.
2.	Discourages the use of troctolitic to prolong or sustain the maturity of the preterm baby. This is because several studies indicated that it was difficult to stop regular rhythmic contractions or established preterm labour. The other reason being that there was no significance difference in the baby born before 37 weeks and after 37 weeks if correct measure to sustain life were followed. If the baby born before 37 weeks was given magnesium sulphate as neuroprotection the outcomes were good.
3.	Encourages the use of Magnesium Sulphate as neuroprotection and prevent cerebral palsy.

4.	Addresses the issue of administering prophylactic antibiotics wherein antibiotics are only recommended if the woman had ruptured membranes and not administered if membranes are intact. This had shown good improvement on the neonatal outcomes.
5.	Encourages the midwives to administer erythromycin and to avoid the use of amoxicillin. Amoxicillin was found to have some adverse effect on the preterm babies, it increases the chance e of necrotizing enterocolitis while erythromycin showed some e positive outcomes on the preterm babies.
6.	Discourages routine delivery by Caesarean section for improving preterm newborns outcomes is not recommended, regardless of cephalic or breech presentation. This is because studies show that there is no significant improvement on the outcomes of the preterm newborn baby.
7.	Discourages the use of neural thermal environment and incubators to all preterm less than 2000 g or those who are 2000 g and are unstable. If the baby become stable can be nurses in a warm environment on KMC.
8.	Recommends the use of continuous positive pressure to all preterm babies who have respiratory distress syndrome(RDS).
9.	Advocates for the administration of Surfactant replacement therapy for intubated and ventilated newborns with RDS.
10.	Advises midwives that during ventilation of preterm babies born at or before 32 weeks of gestation, it is recommended to start oxygen therapy with 30% oxygen or air (if blended oxygen is not available), rather than with 100% oxygen

These professionals practice independently, focusing particularly on pregnancy, childbirth, the postpartum period, care of the new-born, and the family planning and gynaecologic needs of women. The CNM and CM practice within a health care system that provides for consultation, collaborative management, or referral, as indicated by the health status of the client (American College of Nurse-Midwives, 2009). ACNM listed eight (8) general standards as follows:

 Midwifery care should be provided by qualified practitioners.

 It should occur in a safe environment within the context of the family,

community, and a system of health care.

- 🔦 Midwifery care supports individual rights and self-determination within boundaries of safety.
- 🔦 Midwifery care comprises knowledge, skills, and judgments that foster the delivery of safe, satisfying, and culturally competent care.
- 🔦 Midwifery is also based upon knowledge, skills, and judgments which are reflected in written practice guidelines and are used to guide the scope of midwifery care and services provided to clients.
- 🔦 Midwifery care is documented in a format that is accessible and complete.
- 🔦 Midwifery care is evaluated according to an established programme for quality management that includes a plan to identify and resolve problems.
- 🔦 Midwifery practice may be expanded beyond the ACNM core competencies to incorporate new procedures that improve care for women and their families (ACNM, 2009).

Eight (8) recommendations were derived from this study. Therefore, the results from this study will form basis in the development of specific policies and guidelines especially in resource limited areas like Limpopo Province.

In the USA, guidelines have been developed in 1999 following the alarming rate of perinatal mortality which was linked with preterm birth. The guidelines were revised in 2014 to meet with the global standards. All pregnant women between 16 and 24 weeks gestation are subject to cervical screening to detect short cervix. Short cervix less than 10th centile which is 25 cm was taken as risk factor. This women at risk will undergo cervical cerclage to preserve pregnancy and reduce the risk of preterm birth (Glanc *et al.*, 2014).

A study by Hallowell *et al.* (2011) indicated that provision of antenatal classes in groups with similar need for example teen antenatal class or class of low socioeconomic status showed promising results. Provision of nutritional programmes, health education on prevention of preterm birth to high risk women, telephone support, home visit and nutritional supplements gave promising improvement in the prevention of preterm births and preterm complications. The study findings revealed that the area of preconception care among child age bearing women is neglected and need more attention, hence the recommendations on preconception care were outlines by the midwives

2.2.4 Germany Midwifery Standards

In Germany, the preterm birth rate is 9% and 77% of perinatal deaths result from premature born infants. A review of the articles in PubMed database from 1966 to 2012 yielded the recommendation that for midwives to reduce the incidence of preterm births and its complications they need to employ secondary prevention with the goal of early identification of pregnant women at an elevated risk of going into labour prematurely, so that these women can be helped to carry their pregnancies to term. The management during antenatal period and labour included the administration of progesterone prophylaxis, inhibition of labour using tocolysis, induction of lung maturity using glucose corticosteroids and provisioning of antibiotics in case of infection. Non-drug management included bed rest and psychological support to pregnant women (Schleußner, 2013).

2.2.5 United Kingdom Midwifery Standards

The Royal College of Obstetricians and Gynaecologists (RCOG) influenced by the rate of 8 premature births out of 100 births, developed a patient information leaflet for the public. The leaflet provides all pregnant women with information on what causes preterm birth, what a woman can do if she suspects she is falling into labour before

the time, what would be the expected support and management she will receive. This information equips the woman and prepare her psychologically and make her to be able to provide proper care to her baby if is born before time. It also makes the woman form part of solution or shared decision-making as far as the prevention of preterm birth and management of premature baby is concerned. This has brought a lot of improvement in maternal and neonatal care in the UK (Prusova *et al.*, 2014).

On the other hand, the UK National Institute for Health and Care Excellence (NICE) guidelines recommended that midwives need to provide support and information on the risks of preterm birth to women at risk and those planning to have preterm birth, offer women the prophylactic progesterone and cervical cleavage (NICE 2015). The midwives need to diagnose early the occurrence of pre-labour premature rupture of membranes (P-PROM) and associated infections and provide women with antibiotics. Midwives can diagnose the preterm labour with intact membranes and provide women with tocolytic (inhibition of uterine contraction with drugs) to cease the contractions and provide women with maternal corticosteroids and magnesium sulphate for neuroprotection (NICE, 2015).

In addition, midwives need to discuss the advantages of the mode of delivery, either normal vaginal or Caesarean birth, with the woman in order for her to choose the safest mode. Midwives should preform foetal heart monitoring continuously to ensure normal foetal well-being throughout the labour process. They should time the clamping of the cord properly, wait for 30 seconds before cutting the cord but not more than 3 minutes and possibly place the baby below the placental level to allow placental supply to the baby (NICE, 2015).

2.2.6 Midwifery standards in South Africa

The South Africa National Department of Health developed a manual for clinics, community health centres and district hospitals with guidelines for maternity care that

are reviewed every 5 years. The guidelines set standards for quality maternity care that reduce maternal and neonatal deaths (DOH, 2015). The standards were not adhered to due to lack of proper training, poor communication, poor filing system and lack of support needed to promote quality care. The eight (8) standards included:

Antenatal care: outpatient notes made at each consecutive antenatal clinic visit after the initial booking to make sure all baseline data of the patient that would assist in quality ANC is not missed. **Acute admission:** the clinical information recorded in the hospital admission record on admission to hospital for antenatal/postnatal problems or when in labour. **Follow-up notes:** made after admission for acute antenatal or postnatal problems **Handover notes:** handover of patient care from one professional or team to another, including doctor-to-doctor or team-to-team handover in hospital at night and over weekends. **Surgery notes:** notes from surgery or **instrumental delivery notes.** **Discharge notes:** the clinical information recorded in the discharge record and included in the discharge summary. **Referral notes:** communication from referring hospital to more specialized levels of care. The standards outlined above assist in providing quality maternal care that reduce maternal and neonatal deaths (DOH, 2015).

In South Africa, the SANC outlines the competencies of registered midwives in Section 1 of R. 2488 which defines a midwife as a professional who has undergone training and is registered as a competent practitioner and is expected to execute the midwifery regimen with diligence. Furthermore, midwifery care should be provided to people of all races and culturally diverse communities, using the skills and judgement in line with the regimen (SANC, 1990). The standards outlined above assist the midwives to provide quality care that promote quality maternal services, including the new-born babies at risk, such as preterm babies.

2.3 The Role of Midwives in Provision of Quality Care for Preterm Babies During Antenatal, Intrapartum, Postnatal and Resuscitation

According to SANC, a midwife is a person registered under the Nursing Act No. 33 of 2005 to support and assist the mother and baby, to achieve and maintain optimum health during, pregnancy, and all stages of labour and puerperium (SANC, 2005).

2.3.1 Preconception Care

According to the global report *Born Too Soon*, midwives have a role to educate boys and girls on reproductive health to avoid unplanned pregnancies that may lead to preterm birth and delivery of a preterm baby. Midwives educate women on the use of contraceptives to space children and promote rest of the body from one pregnancy to the other (Blencowe *et al.*, 2012). They need to monitor the weight gain. Weight loss can indicate some nutritional problem that needs correction before conception, whilst excess weight gain can indicate maturation disorder known as obesity that poses the risk of premature birth (Blencowe *et al.*, 2012). The midwives need to provide the women with micronutrients like folic acid and iron to prevent and treat maternal anaemia which can cause preterm labour.

Maternal mental stability promotes good foetal growth and prevents preterm labour. Therefore, midwives need to monitor the women for poor mental health and avoid abuse by intimate partners, treat any mental condition by providing emotional and psychological support and refer severe cases to the psychologist and psychiatrist for further management and drug therapy if necessary to reduce incidence of preterm birth (Blencowe *et al.*, 2012).

Midwives need to screen and diagnose and treat STIs like HIV and vaginal conditions as these fall amongst causes of preterm labour and birth ((Blencowe *et al.*, 2012). Identify and stabilize chronic conditions like diabetes and hypertension before conception as these medical conditions are a leading cause of preterm birth. Midwives

need to advise childbearing and pregnant women to avoid substance and alcohol abuse as these may cause preterm labour and compromise the quality of life of preterm babies (Blencowe *et al.*, 2012). In addition, a study done in Argentina by Belizán *et al.* (2013), highlighted that some lifestyle pattern in the preconception period may lead to risk for preterm birth. Therefore, there is a need to emphasize preconception care services by midwives or another SBA to reduce the risk. All women of reproductive age should receive preconception counselling to prevent pregnancies in adolescents because at this stage the body is not ready to carry and nurture the growing foetus inside the uterus leading to preterm labour and pose the risk of a preterm baby, and to poor quality of life or even death (Belizán *et al.*, 2013).

Midwives should advise mothers to avoid unintended pregnancies that would be neglected and the development of hyperemesis gravidarum that can cause anaemia, or preterm birth. They should promote optimal birth spacing in all mothers to give the body a chance to rest and become ready for the next pregnancy that would reach term and reduce risk of preterm birth. Midwives should optimize pre-pregnancy weight and nutritional status as well as supply multivitamin supplementation and complete vaccination for adolescent girls as this intervention promotes good maternal health that reduces the risks of preterm labour and birth. All this would reduce the risk of preterm birth and improve the health of unborn babies (Belizán *et al.*, 2013). Midwives should develop evidenced-based strategies to save the lives of preterm babies in the prenatal care like reproductive health. Education on nutrition and family planning showed improvements preventing preterm birth and promoting quality of life of the preterm babies (Lawn *et al.*, 2009). The findings from this study showed the gap in preconception care in Limpopo province. The scope of practice R2598 lacked specific preconception guidelines that include all child bearing women and teenagers.

2.3.2 Antenatal Care

The Southampton University Hospital outlined the role of midwives during antenatal as taking of full history on the first (booking) visit which includes current health history, previous pregnancies, social circumstances, partner's health, and collection of screening bloods tests. The full history would assist the midwife to identify women at risk of preterm labour and refer them to the appropriate obstetric team who would manage the woman properly and reduce the risk of preterm labour and birth (University of Southampton, 2013). Midwives provide the woman with health advice on well-balanced diet that would prevent anaemia, prevent maternal infections, promote maternal health and growth of the developing foetus and prevent premature birth and save the life of the neonate. They also advise the mother on subsequent visits and adherence to all appointments to keep on track and remain under supervision of skilled midwives till the delivery of a full-term healthy baby (University of Southampton, 2013).

Lawn *et al.* (2009) argued that key interventions in low-income countries during ANC include tetanus toxoid immunization, syphilis detection and treatment and prevention management of malaria in pregnancy. Infections are amongst the causes of preterm labour and birth, therefore, prevention and management of such infections would reduce the risk of preterm birth and lead to the saving of lives of preterm babies. Detection and management of obstetric emergencies like placenta praevia and antepartum haemorrhage, and administration of antenatal steroids can improve survival of preterm babies by 31% and reduce morbidity by 34%.

According to Basic Antenatal Care (BANC), the role of midwives includes to detect and treat anaemia, other chronic diseases such as tuberculosis, or complications of HIV infection and other STIs. They also improve the nutritional status of the woman. This substantially improves the woman's chance of survival should a severe complication occur during pregnancy or childbirth (DOH, 2005). Detection and

treatment of some of the maternal infections that are dangerous to the infant, of some maternal medical conditions such as diabetes mellitus that are harmful to the infant and of complications arising in pregnancy such as pre-eclampsia or poor intrauterine growth of the infant can also be done by a midwife. Treatment and intervention may help to prevent the death of the infant (DOH, 2005:5). If not well managed, the above-mentioned conditions can lead to occurrences of premature birth and its complications. Therefore, this *Department of Health Handbook* was developed as guidelines that would assist midwives in reducing premature birth, hence, reducing death due to complications of prematurity and save the lives of preterm babies (DOH, 2005).

2.3.3 During Labour

In France, a study known as *Foetal Heart Monitoring and Survival of the Very Premature Newborn*, directed the SBAs/midwives to monitor the foetal heart before contraction and after contraction to pick up the foetal bradycardia or tachycardia which indicates an abnormally low or high foetal heart rate. The foetal heart rate was recorded three times for a period of an hour within 24 hours, or if the patient was in labour it was recorded continuously. The foetal heart rate is considered normal if it ranges between 120 and 160 beat/minutes with an oscillation between 5 and 25 beats/minutes in absence of decelerations (Ayoubi *et al.*, 2002).

The foetal heart rate was considered abnormal if there was tachycardia of >160 beats/minutes and bradycardia of <120 for more than 10 minutes. Other indicators for abnormal foetal heart rate included repeated decelerations of 5 episodes per hour where the foetal heart decreased by 60 beats/minutes for more than 30 minutes as well as flat tracing of variabilities fewer than 5 in 10 minutes (Ayoubi *et al.*, 2002). The preterm birth that reacted to contraction with tachycardia stood a better chance to survive immediately after delivery than those that had a flat foetal heart rate trace which is an indication of non-reassuring state of the foetus in the uterus. Monitoring of

foetal heart rate improved quality of life of the preterm babies as the foetus at risk were picked up in time to provide proper management (Ayoubi *et al.*, 2002). In South Africa, midwives are expected to exclude the specific cause of preterm labour, for example, hypertension and treat the cause. After establishing the exact cause at the clinic/health centre, a midwife needs to transfer the woman from a community health care centre to a hospital where the patient will be managed by a team of experts like advanced midwife, gynecologist, pediatrician for proper management that would save the life of the preterm baby. A gynaecologist would administer tocolytics to stop the contractions to prevent preterm birth and promote the quality life of the preterm baby.

At the same time, they would provide the woman with steroids beforehand for 24 hours in advance to enhance the foetal lung maturity and prepare the baby for extrauterine life in case measures to prevent preterm labour fails. If the cause of preterm labour is infection, the woman must be given antibiotics starting with intravenous route followed by the oral route. A success in managing infection will stop the preterm labour, hence, promoting the quality of life of the baby. Guidelines direct that the foetal heart rate should be monitored through continuous cardiotocography (CTG). If the cervical dilatation progresses to 6 cm, the midwife must allow labour to continue and deliver the baby in a slow gentle manner with episiotomy to avoid injury to the fragile brain and to save the life of a preterm baby (DOH, 2007).

In South Africa, the National Department of Health adopted the *Helping Baby Breathe* (HBB), an American Academy of Paediatrics protocol and in training all SBAs to perform HBB. The skill enhances the role of midwives to assist the premature neonate to maintain respiratory functioning. The role of the midwife when faced with premature birth is to prepare the delivery room in a warm temperature, prepare the emergency trolley, and call for assistance. Immediately after the birth of the neonate, the midwife dries the baby if not crying or not breathing well, clears the airway and stimulates if there is no response, clamps and dries the cord, ventilates the baby with bag and

mask and gives 40 breaths per minutes. The procedure is continued until the baby starts to breath. The midwife should call for doctor or paediatrician for mechanical ventilation if there is no response (DOH, 2014).

2.3.4 Postnatal

A USA study titled, *Newborn Survival in Low Resource Settings-Are we Delivering*, provides guidelines that SBAs, including midwives, need to be trained in resuscitation skills, with a belief that this will reduce neonatal death by 30% and save the lives of 190 000 neonates per year (Lawn *et al.*, 2009). To save the lives of preterm babies after delivery, a midwife needs to maintain respiratory function by clearing the airway, monitoring of respiration, give humidified oxygen at a rate of 40% to maintain saturation between 89% and 92% and provide the newborn with surfactant per prescription or hospital protocol (Davidson *et al.*, 2012; Harrison, 2008; Sellers *et al.*, 2012). The midwife should maintain nutrition fluid and electrolyte balance at normal level through encouraging the mother to breastfeed. If the baby is unable to feed well, the midwife should express breast milk and feed the baby through a cup or nasal tube. A midwife should insert intravenous solution to very preterm babies and provide intake based on the newborns weight and age (Davidson *et al.*, 2012; Harrison, 2008; Sellers *et al.*, 2012).

Midwives should prevent infection through strict hand washing to minimize infections and use separate equipment for the sick neonates to avoid cross-infection. They should follow standard precautions to isolate neonates with infection, limit visitors in the preterm unit and encourage visitors to wash hands before handling the infant. Midwives should maintain aseptic techniques when changing intravenous tubing and solutions, clean incubators and radiant warmers every week, according to protocol (Davidson *et al.*, 2012; Harrison, 2008). Do position changing and care of pressure sores, use sheepskin under the head to avoid skin breakage. Staff with infection should be temporarily removed from the neonatal unit. Rooming in should be

encouraged to avoid movement of mothers to areas with microbes, avoid overcrowding, i.e., cribs or cot beds should have adequate space to prevent cross infections. The environment should always be kept clean by taking high swabs to assess microbes and using disinfectants to clean the floors and walls to minimize microbes. Preventing infection would save preterm babies as these neonates have immature immune systems and cannot fight infection on their own. Therefore, catching infection would compromise the quality of life of preterm babies (Davidson *et al.*, 2012; Harrison, 2008; Sellers *et al.*, 2012).

The role of midwives to save the preterm babies during postnatal care will also include provision of emotional and psychological support, teaching the mothers' exclusive breastfeeding, hygienic cord care and keeping the baby warm. Emotionally stable mothers have low risk of neglecting and abusing the infant, hence, proper infant maternal attachment that stimulates sensational and psychological adaptation of the neonate must be encouraged and this will improve the quality of life of the neonates (Lawn *et al.*, 2009). Women must be counselled on family planning for child spacing and proper attention to the baby. The woman must be reviewed within 2-3 days after delivery, and maternal and child health should be integrated, i.e., mother family planning schedule with immunization schedule should be combined. This role by midwives was tested in Asia and found to be saving the lives of neonates by 20%. The home visits by the mothers within three days save the lives of preterm babies by 17% (Lawn *et al.*, 2009). This practice has shown the improvements in the saving of lives of preterm babies.

Midwives should maintain neural thermal environment to prevent hypothermia and should warm and humidify oxygen and place the infant in a double-walled incubator to avoid irradiative heat loss. They should use radiant warmer and plastic wrap over the baby and pipe in humidity warmer beds because it blocks the infrared heat. Midwives should avoid putting babies on a cold surface like X-ray plates. They should

pad cold surface with diapers and use radiant warmers during procedures. Midwives should wash hands before holding the infants to prevent heat loss through conduction. Midwives should use warmer ambient humidity and keep radiant warmers and incubators away from windows and cold external walls and out of drafts. Incubator portholes should be opened when doing nursing care and plastic sleeves on portholes should be used to decrease convective heat loss (Davidson *et al.*, 2012; Harrison, 2008; Sellers *et al.*, 2012). The mother should be supported and educated to prepare her for discharge and continued home care. The mother should be referred to available support groups in the community to promote quality of life of preterm babies.

Several studies indicate that KMC is also an appropriate and effective method to promote warmth, parent infant attachment and promote growth in preterm babies. This is skin-to-skin ambulatory care that keeps the preterm in constant body temperature of her mother, enhances milk production, limits the chance of infection, boosts maternal confidence and enhances growth of the preterm baby. It is done intermittently in intensive care units (ICUs) and continuously at home (Davidson *et al.*, 2012; Harrison, 2008; Sellers *et al.*, 2012).

KMC is when stable low-birth-weight infants are nursed skin-to-skin between their mother's breasts. Skin-to-skin care may be intermittent at first but should gradually become continuous and persist until the infant weighs at least 2000 g. KMC was discovered in Bogota, Colombia in 1978, in response to shortages of people power and other resources in hospitals there. Doctor Rey and Martinez developed KMC as a method of ambulatory care for low birth weight infants in their hospital where there had been high morbidity and mortality among these infants due to overcrowding and sepsis. As soon as the infants are stable, and the mothers trained in the KMC method, the infants are sent home, irrespective of weight or gestational age, carried between their mothers' breasts always and fed only the mothers' milk. They are followed up at a special KMC clinic (Thukral *et al.*, 2008).

In South Africa, the National Department of Health has also adopted KMC as a nursing strategy to promote warmth, bonding and growth of the premature babies. The KMC increased milk production in the mother and the babies grow well as they feed on demand. It promotes sleep and reduces chances of infection to the neonates, all these benefits promote good quality life of preterm babies (Thukral *et al.*, 2008). The midwife's role is to counsel and support the mother and assist her to put the neonate on her chest continuously, except when going to the toilet or bath, this should continue until the neonate records 1.8 kg which is a discharge weight. The KMC continues at home until the neonate reaches 2.5 kg.

The other role is to assist the mother to exclusively breastfeed the neonate and express the breast milk for the neonates who are unable to suckle. The midwife feeds the neonates who are unable to suck by nasogastric tube or cup. The midwife observes and provides extra nursing care to the neonate like oxygenation and monitors the vital signs like weight temperature, pulse and heart rate to ensure good progress. The midwife promotes good personal and environmental hygiene in the KMC unit. The KMC is adopted in all 9 provinces, including the Limpopo Province (DOH, 2014).

2.3.5 Preserving the Brain of Preterm Baby

In the UK, the delivery unit needs to be prepared for newborn baby resuscitation always to assist all newborn babies in their first golden minutes of life. In case of neonatal asphyxia, meconium aspiration, preterm baby resuscitation needs to be initiated as follows: dry the baby and remove the wet towels, cover the head and start a clock. Assess the breathing and heart rate if not breathing open the airway by tilting the head and give five (5) inflation breaths, assess for breathing or chest movement; if not breathing, recheck the positioning of the head. If the chest is moving but heart rate is below 60 starts with chest compression (New born Resuscitation Council, UK, 2011). Give the baby three (3) compressions per each breath, and if the heart rate is

still below 60, consider admission to neonatal unit and start with oxygen therapy and other drugs. This is designed to save the brain of the newborn and to promote the quality of life of all newborn babies mostly the preterm babies who are prone to asphyxia, meconium aspiration, RDS as well as intraventricular haemorrhage (New born Resuscitation Council, UK, 2011). In Australia there is a golden hour protocol that guides the midwives and doctors on preserving the brain of the preterm infants through the following: midwives need to have a full history of the woman from antenatal which include administration of antenatal steroids or magnesium sulphate ($MgSO_4$). Prior to delivery, they should allow foetal lung maturity and prepare the resuscitation unit and allocate role for each team member. They should also prepare the neonatal unit and incubator. Immediately after delivery of the baby, rate the APGAR score of the infant by pressing an APGAR timer, the midwife should take blood for blood gas analysis to determine the level of oxygen and prevent hypoxia that causes brain insult (Bolisetty *et al.*, 2013).

The doctor will apply the continuous positive air pressure (CPAP) and a plastic bag hat, put pulse oximeter on the right wrist to measure the oxygen saturation rate to maintain saturation at a lower target range of oxygenation (85 to 89%), as compared with a higher range (91 to 95%). Midwives should alert the neonatal unit to admit the baby and explain the condition of the neonate to the parents to gain cooperation. The midwife at the neonatal unit will do the routine new-born care, including weighing, measuring of length and head circumference, administering of Konakion (Vitamin K). The baby will be put on antibiotics, if necessary. The midwives and doctors need to keep records of all management. The management is done to preserve the brain of the preterm baby (Bolisetty *et al.*, 2013).

In Colombia where the KMC was started, a study of the relationship between behaviour and KMC indicated that the preterm infant who were on KMC showed a high score of neurological development, including brain, showing that KMC reduces

the risk of hypothermia which can result in hypoxia and then brain insult. The results suggest a modest beneficial effect of KMC on the mental development of preterm infants at 12 months of age. Furthermore, this finding was most evident for the subgroup of at-risk low-birth-weight and premature infants. The study suggested that KMC is a means of enhancing environmental caring, creating a climate where parents become progressively more aware of the child and more prone to sensitive caring. The optimal caring context stimulates the infant who, in turn, takes advantage of the more optimal environment (Tessier *et al.*, 2003).

In Israel, the treatment of maternal infections like STIs that may ascend through the vagina to the uterus and infect the unborn foetus showed improvement in reducing brain insult or injuries. Correct management of chorioamnionitis which is the inflammation of the chorion and amnion sac that protects the foetus also reduces the risk of brain damage in neonates. Prevention of intrauterine infection that can be transferred to the unborn baby by providing women with prophylactic antibiotics reduces the risk of brain injury. Prevention of all this infection promotes the quality life of a preterm baby (Ofek-Shlomai & Berger, 2014).

Premature infants with neonatal infections were more likely to have cerebral palsy, lower cognitive scores, lower psychomotor developmental index scores, visual impairment, and impaired growth compared with those who were not infected. The study showed that all preterm babies need to be nursed in a warm and clean environment to prevent neonatal infection as these preterm babies are prone to infection, and if the baby develops infection during the postnatal stage it must be treated accurately to prevent brain damage (Ofek-Shlomai & Berger, 2014).

In India, the leading country with high rate of preterm birth and death, Dhabhai (2016) indicated that midwives had a role to identify the periodical infections as this was amongst the top ranked causes of premature birth and preterm babies' complications.

The midwives need to identify gingivitis, STIs, vaginosis and all other genital tract infections as these were the most common infections found to be ascending to the uterus and cause intrauterine infection leading to premature birth. Premature babies born to mothers with untreated periodical infections were not surviving as this also caused some complications like hepatomegaly to the preterm neonates (Dhabhai, 2016). In South Africa, the National Department of Health adopted HBB, an American Academy of Paediatrics protocol and is training all skilled birth attendance to perform HBB. The skill enhances the role of midwives to assist the premature neonate to maintain respiratory functioning. The role of midwife when faced with premature birth is to prepare the delivery room in a warm temperature, prepare the emergency trolley, and call for assistance. Immediately after the birth of the neonate, the midwife dries the baby if not crying or not breathing well, clear the airway and stimulate if no response, clamps and dries the cord, ventilates the baby with bag and mask and gives 40 breaths per minutes, continue the procedure until the baby start to breath. Call for doctor or paediatrician for mechanical ventilation if no respond. This is done to prevent hypoxia and increase oxygen supply to the brain of the baby (DOH, 2014).

The Limpopo Initiative for New-born Care (LINC) is a provincial programme package which was established in 2003 to improve the quality of all aspects of new-born care in all districts. The programme was rolled out from 2004 to train doctors and midwives in caring for sick new-born babies, including preterm babies. The LINC enforces KMC as described above as a method that can enhance neonatal neural development and preserving of the neonate brain. It promoted that the neonatal unit be established and become a separate independent unit specializing in sick neonates. The programme also promotes the allocation of specialized neonatal nurses and paediatricians and minimizes the rotation of neonatal staff. The programme trains professional nurses, enrolled nurses as well as assistant nurses to provide neonatal care. Since 2003 to 2009, 553 nurses (331 professional nurses + 232 enrolled nurses) and 333 doctors were trained. This was done to make sure that sick neonates receive expert help,

prevent hypoxia and increase oxygen supply to the brain of the baby, hence reducing the incidence of brain insult or damage. Reduced brain insult also reduces the perinatal morbidity and mortality (Department of Health Limpopo, 2011). Study showed the gap in training of nurses, especially neonatal nurses who look after the sick neonates including preterm neonates

2.4 The Challenges Faced by Midwives in the Provision of Quality Care of Preterm Babies

In Australia and New Zealand, the midwives indicated that they experienced challenges which included lack of support and enabling environment, policy support, access to basic supplies, transport and other relevant obstetric emergencies and newborn care services (Kildea *et al.*, 2010). Critical shortage of SBAs, inadequate skill mix and misdistribution of both skilled and skill mix (three professional groups, including midwives, general practitioners with obstetric training, and specialist obstetricians) across countries, for example, WHO indicated 700,000 midwives are needed worldwide to provide skilled care.

Another challenge was the lack of proper incentives leading to the use of inappropriately trained nurses, and supervision of maternal care by doctors with no obstetric skills (Kildea *et al.*, 2010). The other challenge included not enabling the midwives to work to their full scope of practice and referral support from general practitioners with obstetric skills and special obstetric services (Kildea *et al.*, 2010). Another problem was the lack of decentralization of maternal care and the failure to provide primary care at the community centers close to patients' homes, and not training indigenous midwives to provide the service on site with support from integrated networks of SBAs. The other challenges were a combination of roles where nurses also practice as midwives (Kildea *et al.*, 2010). These challenges that interfered with the role of midwives to save the life of premature babies were also alluded to in this study.

Belizán *et al.* (2013) indicated that there are varieties of evidence-based intervention aiming at the reduction of preterm birth and death due to prematurity. However, these are not often used, especially in countries with limited resources such as in South East Asia, Asia and African states. Interventions like the use of antenatal corticosteroid, KMC are more effective, but not tested in low socioeconomic countries to improve survival and future outcomes of preterm care (Belizán *et al.*, 2013). Belizán *et al.* (2013) added the other challenge of several mothers in poor communities who are still not receiving scientific interventions as there is still 50 million births occurring outside birth facilities (Belizán *et al.*, 2013).

Lawn *et al.* (2009) indicated that reports show success stories in low-income countries concerning ANC, but the quality of content care is questionable. There is also low coverage of antenatal steroids (Lawn *et al.*, 2009). A study done in Brazil revealed the challenges that led to infectivity of KMC though it is beneficial to saving the lives of preterm babies. The challenges included the low socioeconomic status of the mothers, mostly those from the rural areas. Lack of emotional and psychological support was cited as contributory factors. Conflicting or power exerted by care providers to women wherein the mother was forced to remain in the neonatal unit with the baby for weeks not considering other social factors that surround the woman was another challenge (Véras & Traverso-Yépez, 2011).

KMC is cheap and easy to implement in the reduction of preterm morbidity and mortality, however, there were still some challenges to use these interventions. The main challenge to midwives were shortage of staff, lack of clear guidelines to nurses and lack of training on KMC were ranked top. Lack of equipment and rooms for KMC, broken continuity due to handing over to other midwives when others go to off, as well as fear of occurrence of other new conditions that can be detrimental to the preterm babies (Seidman *et al.*, 2015),

Several research studies revealed that there are still challenges in midwifery services in low socioeconomic countries mostly South Asia and sub-Saharan states. The challenges include lack of training and education of midwives due to financial constraints and other factors, and poor measures in place to regulate the quality of existing workforce (Speciale & Solsona, 2016). Other factors include shortage of workforce that interferes with performance of midwives or competency, responsiveness and productivity. The working environment is not enabling midwives to maximize and sustain quality maternal care, including preterm babies. Poor management and lack of policies that maximize and sustain midwifery care, lack of finance leading to low midwives' salaries, lack of medical and supplies and development of costed plans to maximize and sustain midwifery care are further examples (Speciale & Solsona, 2016)

A study in Nigeria showed that there are difficulties in saving the lives of preterm babies due to the scarcity of resources, especially in poorly equipped neonatal units. There is a lack of protocols on how to prevent preterm labour and save the preterm babies' lives (Iyoke *et al.*, 2014). A study in Uganda indicated the challenge of late booking in the ANC. Those who booked did not attend for the minimum four visits prescribed. This was because of limited number of SBAs and few facilities to provide maternal health care and low socioeconomic status of the women concerned (Waiswa *et al.*, 2010). The other challenges were lack of clinical facilities/obstetric units and lack of specific protocols on the care of preterm babies. Due to lack of midwives there was poor supervision on baby feeding immediately after birth, no promotion of exclusive breastfeeding, and poor hand washing practices. Community-based care exposed the preterm babies to many people who may be sick and can infect the vulnerable baby. The whole situation described above impacts more on premature babies who are vulnerable, hence increased neonatal death due to immaturity (Waiswa *et al.*, 2010).

Challenges in South Africa include shortage of midwives and skills mix (three professional group including midwives, general practitioners with obstetric training, and specialist obstetricians). Shortages of human resources were due to increased disease burden and HIV infections amongst women of childbearing age and direct infection of many health personnel. The other factors came with the dawn of democracy wherein more nurses and midwives moved from rural areas to better opportunities elsewhere. The increased influx of patients to PHC due to free health and lack of transport were also a challenge. Other challenges include poor progress in reducing HIV infection, poverty and inequalities that led to barriers in accessing the essential health facilities and care (Mhlanga, 2008).

The inappropriate use of developed guidelines as indicated by poor care during pregnancy, labour and postnatal periods was cited by Mhlanga (2008). The movement of nurses from rural to urban areas left the PHC mainly at rural areas with a challenge of providing proper basic ANC. The inadequate basic ANC resulted in many complications to pregnant women including preterm birth. The increased rate of preterm births in rural areas poses a challenge as there were shortages of midwives to care for neonates leading to early neonatal death (Mhlanga, 2008), and, moreover, no staff establishment of the neonatal unit both doctors and nurses (NPMMC, 2008-2010). There are only 862 doctors and 1744 vacant posts of doctors in the Limpopo Province and 81 specialists and 323 vacant posts (NPMMC, 2008-2010).

2.5 Good Practices That Promote Provision of Quality Care of Preterm Babies

Grenada is one of the countries with limited resources but have good practices that prevent occurrences of maternal health complications, including quality preterm care. The country emphasizes quality midwifery education, their midwives are trained using the British model of three years hospital-based training and then 9 months of midwifery. Most ANC is provided by midwives through a network of multipurpose

health centres and smaller health stations throughout the country. There is provision of home deliveries attended by district midwives, this mostly caters for 10% of deliveries and the rest take place in general hospitals (Laukaran *et al.*, 1994). The other secret to Grenada's good code of midwifery practice was that the midwives are autonomous and do not rely on technology. There are clear midwifery-related protocols written in simple language the midwives could understand.

There is round the clock coverage of all pregnant women and monthly face-to-face meetings of midwives with common training and social background making them to share and enforce good practice, hence promoting maternal quality care. They focus more on patient education and patients retain their antenatal records, do not rely on social criteria to predict risk status, but rather refer all women with risk factors, irrespective of socioeconomic background. Most success is seen in the fact that they promote primary health care system and community-based midwifery care (Laukaran *et al.*, 1994).

2.6 Managers' Support for Midwives to Promote Provision of Quality Care of Preterm Babies

According to the WHO, wherever in the world midwives are working they can benefit from supervision and the support of a supervisor. Midwives carry the responsibility for the mothers and babies that they care for and can feel very vulnerable when faced with challenging situations. When midwives embrace supervision, they find it helpful to their professional purposes by feeling supported in their practice (WHO, 2011). In UK, supervisors of midwives are experienced practising midwives who have undertaken additional education and training to support, guide and supervise midwives (NMC, 2009).

Supportive supervision is a description of the way supervision can be carried out to provide maximum support to midwives. The challenges of working independently can

be overwhelming. Simply knowing that someone is there for you personally have a great advantage, even if that person is simply someone with whom you can discuss your ideas or questions, or someone with whom you can speak after having had a difficult or challenging experience. The ability to share your concerns in these circumstances can be very beneficial., and, according to the WHO, it is of importance to support the midwives providing maternal and neonatal care save the lives of mothers and babies (WHO, 2011).

This is important because proper leadership and management promotes safety and develops the skills of practicing midwives. Managers may promote saving preterm babies through capacity building by implementing leadership courses, fellowship awards to enhance skills and competences, appoint nurses at decision-making levels, service provision and faculties. This allows midwives to feel part of the team and work effectively to reduce birth and deaths of preterm babies (WHO, 2013).

WHO continues to advocate that midwives need to be advanced in their careers and career path development. Managers need to establish the legislative framework that support better education and training and advance midwifery training at institutions of higher learning. Midwives should be allowed to practice equally and effectively in decision-making roles and to contribute to knowledge generation and expand evidence-based professional practice. They should also improve skills through post-basic training and other career development opportunities. This allows midwives to employ research and current care that assist in reducing preterm birth and deaths, hence saving the lives of preterm babies (WHO, 2013).

WHO further suggests that managers need to promote a positive practice environment through protecting the health and rights of midwives. Midwives should avoid getting infected from HIV, hepatitis, TB and other pathogens. They should also assist with the treatment and support to those who are infected and provide proper code of conduct

and ethical practices. Midwives should also establish equitable gender-sensitive working conditions. This allows midwives to practice safely and free from stress that can lead them to making mistakes that can cost the lives of preterm babies (WHO, 2013).

In South Africa, the SANC suggested the management skills and competencies that would promote safe midwifery care that include developing and implementation of models and theories of management and effective team and leadership and good management of material and human resources. Effective planning, organizing and analysis of integration of relevant legislation, litigation and regulations concerning Midwifery Practice in all settings, for example, private practice, midwifery obstetric units (MOU) and Rural Health Care Units (Sastre-Fullana *et al.*, 2014). Midwives should critically reflect, interrogate, demonstrate understanding and implement conflict and stress management theories/models. Midwives implement appropriate policies, guidelines, protocols, standards for Maternal, New-born, Child and Women's Health (MNCWH). The midwife acts as a consultant in emergency care and quality improvement, with advocacy and negotiation skills and strengthens good governance and accountability in Midwifery (Sastre-Fullana *et al.*, 2014). Therefore, supervision and support of midwives, as well as provision of safe environment can improve the maternal, neonatal and women health care provided by the midwives, hence saving the lives of preterm babies. In contrary, the study revealed a gap in the supervision and support of midwives in the Limpopo obstetric units, hence the need for this study.

2.7 Guidelines to Promote Quality Care for Preterm Babies

According to WHO 2014 State of Midwifery Report that examined the landscape across 73 low- and middle-income countries policy measures that will increase maternal and newborn survival are: delaying marriage and postponing pregnancy at an early stage that predispose to preterm birth and deaths; completing secondary education; comprehensive sex education for boys and girls; contraceptive use to

protect from HIV; family planning using modern contraceptive methods; maintaining a woman's health while pregnant; receiving at least four care visits discussing birth preparedness and emergency planning; demanding and receiving professional supportive and preventive midwifery; women participating in the decisions about the care they and their new-born receive; being supported by a collaborative and effective midwifery team when emergency care is needed (Ten Hoope Bender *et al.*, 2014).

According to WHO (2012), guidelines are recommendations intended to assist providers and recipients of health care and other stakeholders to make informed decisions. Most countries, including South Africa, have guidelines on maternal health i.e., pre-pregnancy, pregnancy, labour puerperium as well as foetal and neonatal care that include care of preterm babies. Unfortunately, preterm birth and death is still a global problem wherein even developed countries like the USA and the UK still have preterm birth and death above average (Blencowe *et al.*, 2013). Guidelines from countries like Canada, Columbus, New York (USA), Uruguay and United Kingdom will be discussed below.

Some countries, including African states like Nigeria, Tanzania and Asian states like India, have already been discussed. According to the global report *Born Too Soon*, there is a need to improve in areas of the national preterm birth rate data, develop proper standard guidelines that will register birth and still birth causes and avoidable factors to have a good indicator to show if we are improving in saving the preterm babies. Each country, including South Africa, needs to have guidelines on preconception care; ANC, intrapartum care and postnatal/newborn care to increase survival and care and reduce disability amongst the preterm neonates (Blencowe *et al.*, 2013).

Canada provides guidelines on the use of ultra-sonographic cervical length assessment in pregnant women at risk in prevention of preterm birth and save the

lives of preterm babies. The ultra-sonographic cervical length assessment can be done through transabdominal, transvaginal or transperineal techniques. The procedure measures the length of the cervix—a short cervix of 15-28 mm predisposes women to preterm labour. Women with a short cervix were associated with the risk of preterm birth. These women undergone cervical cerclage and some were given progesterone therapy to maintain pregnancy to term. This management was found to be useful to the majority of women leading to reduction of preterm birth, hence saving the lives of the preterm babies (Lim *et al.*, 2011).

Similarly, in South Africa, the SANC rules and regulations instruct a midwife to advise a pregnant woman to undergo medical examination by a medical practitioner to exclude abnormalities of the pelvis, including cervix that may pose the unborn baby to danger such as preterm birth (SANC, 1990). Iams (2014) indicated that after the acceptance of the use of progesterone prophylaxis in women with short cervical length in USA, other countries became interested in these guidelines. The study indicated that all pregnant women were offered the ultra-sonographic cervical length assessment to identify shorter cervix early and start with progesterone prophylaxis.

The progesterone prophylaxis was also recommended to women at high risk due to other factors, including history of previous spontaneous preterm birth. The prophylaxis showed a reduction in occurrences of preterm birth, hence sparing the lives of these babies (Iams, 2014). Similarly, in South Africa, the SANC rules and regulations instruct a midwife to refer a pregnant woman to a medical practitioner to perform some special diagnostic measures in pregnancy such as sonar and speculum that would exclude short cervix that may predispose the unborn baby to danger such as preterm birth (SANC, 1990).

Miracle, Di Renzo, Stark, Fanarof, Estrany & Saling (2008), on the other hand, indicated that all women at risk of preterm birth need to receive the antenatal

corticosteroids therapy between 24 to 34 weeks of gestation and over 34 weeks where there is evidence of foetal pulmonary immaturity. This therapy was also indicated in all women at risk and should at least be given an hour before to allow effectiveness in promoting lung maturity. It was also advocated for women with premature rupture of membranes (PROM) and women with medical conditions like diabetes mellitus. The therapy showed good results as far as prevention of complications due to prematurity was concerned, hence saving the lives of the preterm neonates (Miracle *et al.*, 2008). Aleman *et al.* (2013) indicated that the use of antenatal corticosteroids improved the outcome of preterm babies. The corticosteroid reduces the risk of RDS, intraventricular haemorrhage and neonatal mortality in preterm babies. The problem was that most of the care providers, doctors, nurses and midwives were lacking the proper knowledge arising from negative attitude and poor practices as far as the use of such therapies were concerned. Following this study, the use of corticosteroids was accepted and administration to women at risk was advocated and the results were pleasing and most preterm babies survived reducing the neonatal death due to prematurity (Aleman *et al.*, 2013).

The UK confirmed the advantage of using antenatal corticosteroids as outlined by USA studies (Miracle *et al.*, 2008). This was adopted following its evidence in reducing neonatal death, RDS and intraventricular haemorrhage and safety in mothers (RCOG, 2010). They also recommended its use between 24 and 34 weeks of gestation or earlier. The effectiveness of the drugs will also depend on time taken before the labour begun and is safer if women given the drug delayed delivery by 24 hours or more (RCOG, 2010). They also emphasized the issue of repeated doses as this enforce the outcomes. Weekly repeat will reduce RDS and a maximum of 4 doses of 12 mg betamethasone is recommended to reduce RDs and other complications that can put the preterm baby at risk of death. The antenatal steroids reduced the rate of preterm birth and saved the lives of the preterm babies (RCOG, 2010).

A study done in 39 countries worldwide indicated that guidelines on smoking cessation, progesterone and zinc supplementation were strongly recommended in the prevention of preterm birth (Chang *et al.*, 2013). Other seven guidelines focused on the cervical cerclage, micronutrients supplementation, protein energy supplementation, iron and folic acid, supplementation, screening and treatment and bacterial infections and multivitamins for HIV-positive women (Chang *et al.*, 2013). Kenya has guidelines such as the safe motherhood initiative launched with the aim of focusing maternal survival and healthy childbearing that improves survival of preterm babies (Mhlanga, 2008).

In the USA, the American Academy of Pediatrics developed a protocol on helping baby breath (HBB) the golden minutes. The protocol defined a SBA/midwife as one who can save the lives of babies if present at birth and is prepared to take immediate action within the first golden minutes of the newborn. The protocol advocates having a second midwife or the mother's birth companion during childbirth process. They should prepare a clean environment which includes assisting the mother to wash hands and chest to prepare for KMC, close the nearby windows to prevent drafts, supply a heater for heating the room and provide extra lighting if necessary. Midwives should practice good hand washing to reduce infection.

They should prepare a dry, flat and safe space for ventilation of the newborn and check if all equipment of ventilation is assembled and are in good working condition (Singhal *et al.*, 2012). Immediately after birth, midwives should dry the baby to stimulate respiration and keep it warm. If there is meconium in the amniotic fluid, clear the airway before initiating crying. If the baby responds by crying, the midwife should provide routine care (Singhal *et al.*, 2012). If the baby fails to cry, the midwife should clamp and cut the cord, keep the baby warm and position the baby with the head slightly extended to help keep the air way opened. The midwife should clean the mouth or use the bulb airway to suction the baby and clear the airway. The midwife

should stimulate the breathing process by rubbing the head once or twice, check the breathing again. If the baby is not breathing ventilation with a bag and mask will be needed.

The baby should be placed in a resuscitation table prepared earlier and a correct size of mask should be selected to fit the mouth of the baby well. The mask should be placed correctly to completely cover the mouth of the baby and do the bag and mask counting aloud bag one, two, three to give the baby 40 breaths per minute. The protocol was been implemented and was found to be saving the lives of the new-born babies in USA (Singhal *et al.*, 2012).

In South Africa, the National Department of Health, under the supervision of Dr F. Pattinson, developed guidelines and a basic ANC handbook to assist the PHC facilities to provide quality care. Amongst other things, it was designed to screen for, detect, and thus prevent many maternal complications occurring before childbirth. The *National Perinatal Morbidity and Mortality Committee Report* (NPMMC) further explained the specific interventions to save lives of preterm babies, including reducing unexplained intrauterine deaths through good ANC, history taking, foetal heart monitoring, educating the mother and teaching women to avoid unplanned pregnancies, showing them different options of family planning, identification of maternal conditions and treatment. It involves the training of health workers on basic ANC and the execution of all guidelines properly (NPMMC, 2008-2010).

During labour, midwives should reduce preterm birth and intrapartum asphyxia using maternal steroids. They should be competent in the correct use of the PTG which includes plotting, interpretation and reaction to abnormalities in time as well as adhering to antepartum haemorrhage, hypertension and other medical conditions protocols (NPMMC, 2008-2010). The South African National Department of Health, with assistance/research from medical practitioners, outlined the guidelines to reduce

preterm births and improve quality of lives of preterm babies as follows:

2.7.1 Access to Appropriate Health Care

Each province needs to conduct outreach programmes coordinated by doctors and advanced midwives, paediatricians and neonatal nurses. There should be an improvement of transport, referral routes with response rates of less than 1 hour and provision of constant messages to all patients, community and health care providers. The programme will equip the midwives and doctors to prevent the occurrence of preterm birth and develop skills to provide good care to the preterm babies and reduce neonatal deaths due to prematurity (NPMMC, 2008-2010).

2.7.2 Improve Quality Care

There is a need to improve the training of doctors and midwives in essential steps in managing obstetric emergencies (ESMOE). This is a manual that provides drill both on antepartum haemorrhage, hypertensive disorders, HIV and malaria infections and the proper use of PTG to manage labour which promotes maternal care and reduces preterm births and saves the lives of preterm babies. The HBB protocol as discussed above and medical conditions are to be incorporated in curricula for training doctors and nurses. These will produce a skilled person who would minimize preterm births and save the lives of preterm babies (NPMMC, 2008-2010). Postnatal care needs to be improved and Human Immunodeficiency Virus (HIV) infections should be normalized to enhance proper care to the HIV-exposed infants, including infants under 2.5 kg and save the lives of preterm babies (NPMMC, 2008-2010).

2.7.3 Ensuring That Adequate Resources Are Available

The department recommended the provision of adequate staff, doctors, nurses, other health professionals and support staff. The adequate supply of equipment, materials and other supplies should be maintained. There should be adequate beds for both

mothers and newborn babies as well as in critical care units. Estimated beds in level 1 hospitals are 3-4 beds/100, level 2; 2-3 beds/1000 and level 3; 1 beds/100 (NPMCC, 2008-2010:).

2.7.4 Auditing and Monitoring

There should be an improved data collection and review in all clinics, health centres and hospitals conducting mother and child health (NPMCC, 2008-2010:102). Other guidelines that are significant to promoting good health of the women and improve survival of preterm babies include integrated management of pregnancy and child birth (IMPAC). The guidelines prioritize the complications and mark them in red to alert the health care provider to take prompt action. For example, all pregnant women with hypertensive disorders would be referred to high risk clinic at a level 2 hospital for management by an obstetric team to prevent premature birth and save the lives of preterm babies (Mhlanga, 2008). Prevention of Mother-To-Child Transmission (PMTCT) guidelines emphasize that all pregnant and breastfeeding mothers should be tested for HIV and if found negative are to be offered repeat HIV testing after 3 months, and/or around 32 weeks of gestation, and every 3 months while breastfeeding. Mothers who are HIV-positive should be put on lifelong antiretroviral treatment to reduce the viral load that can predispose mothers to preterm birth. The first-choice fixed-dose combination (FDC) of antiretroviral drugs is Tenofovir/ Emtricitabine/Efavirenz (DOH, 2014).

2.7.5 Infant Prophylaxis

All HIV-exposed infants are given prophylaxis with Nevirapine syrup soon after birth or as soon as possible, at the latest within 72 hours. Dosing is determined by birth weight, and is given daily: birth weight >2500 g: 15 mg (1.5 ml); birth weight 1000-2500 g: 10 mg (1 ml); birth weight <1000 g: 2 mg/kg initially. If the mother is on Highly Active Antiretroviral Therapy (HAART), Nevirapine is continued for 6 weeks. Mothers

who received AZT monotherapy during pregnancy their infants should receive Nevirapine until 1 week after all breastfeeding has ceased (DOH, 2014).

If maternal HIV status is unknown, including if the mother is indisposed (due to severe illness, coma, mental illness, or death), start infant NVP and perform an HIV antibody test (ELISA or rapid test) to detect if the infant has been exposed to HIV. If the test is positive, continue Nevirapine as above. Maternal virological suppression is essential for prevention of vertical transmission in infants not on prophylaxis. Therefore, infant prophylaxis should only be discontinued if the mother is virologically suppressed. Breastfed infants should receive 6 weeks of Nevirapine if the mother has been on ART for more than 12 weeks and has a suppressed viral load; viral load is checked for the first time after 12 weeks on HAART (DOH, 2014).

Until she has had a viral load and the result available, the infant should stay on Nevirapine. Extended prophylaxis is needed in breastfed infants if the mother has been on ART for <4 weeks; with viral load testing after 12 weeks of ART and discuss with HIV paediatrician if viral load >1000. However, women who have been on ART for 4-12 weeks: should also ensure a viral load is done before prophylaxis is stopped, and those on ART for 4-6 weeks will need infant prophylaxis for >6 weeks to enable a 12-week viral load to be done and results to be obtained (DOH, 2014).

The Perinatal Education Programme (PEP) is free distance training course for SBAs to equip them with evidence-based care that would prevent premature birth and save the lives of preterm babies (Mhlanga, 2008:118). It includes free health care to pregnant and lactating women and children less than six years, free primary health care services; guidelines on contraception which assists women with child spacing and health talks on the care of newborn babies under 2.5 kg that assists the woman to care for the newborn and prevent early neonatal death, hence saving the lives of preterm babies. Despite all these guidelines, there are still and increased perinatal

deaths due to complications of prematurity (Mhlanga, 2008).

Untreated tuberculosis (TB) represents a far greater hazard to a pregnant woman and the foetus than treating the disease. Therapy must be commenced promptly with the standard daily for six (6) months treatment regimen. Most TB drugs, except Streptomycin, are safe for use in pregnant women. The first-line drugs Isoniazid, Rifampicin, Ethambutol and Pyrazinamide are readily absorbed from the gastrointestinal tract and freely cross the placenta. Treatment of TB would save the life of the neonate by reducing the risk of preterm birth as TB, like other infections, can cause preterm labour (DOH, 2014). The review of the National Tuberculosis (TB) Control Programme in 2009 provided hope for Limpopo Province as it showed that systems had been put in place to ensure effective management of TB and the surging co-infection rates.

The major achievement was the political commitment evidenced by the adequate budget allocation for the programme, a good human resource complement and a continuous TB drug supply. Laboratory infrastructure and capacity to do diagnostics, established community Directly Observed Treatment, Short Course (DOTS) programme catering for about 80% management of TB patients in the community were some of the major achievements for the Limpopo Province. The proper control of TB will reduce preterm births in pregnant women and reduce the risk of neonatal deaths saving the lives of preterm babies (DOH, 2012-2016).

The findings revealed that midwives had an important role in saving the lives of preterm babies starting from preconception, antenatal, labour, neonatal and postnatal period. Challenges such as lack of resources have also been revealed. However, for midwives to perform such a pivotal role, they need to be included in the process of developing and implementing policies and guidelines. They need to be capacitated with skills through self-studies and in-service training, transformational support by

managers and supervisors. They also need provision of safe working environment as well as care on health and safety. Therefore, the researcher in this study sought to develop midwifery practice guidelines to promote the provision of quality care of preterm babies in an environment with limited resources in the obstetric units of the Limpopo Province.

There are several studies that focus on the standards worldwide, in Africa as well as South Africa, that promote the provision of quality care to preterm babies by midwives. The role played by midwives to provide quality care, the challenges or threats that affect the provision of quality care and opportunities available for midwives to excel in the quality care of preterm babies are all discussed. However, the gaps found in the current studies included lack of proper support from the supervisors, lack of resources both staff and equipment to facilitate quality care. Most states have policies and guidelines, but there is poor implementation of the guidelines due to challenges mentioned above. Similarly lack of skilled midwives, some states lack midwifery-centred guidelines that would promote quality care of preterm babies was also revealed in this study.

2.8 The Theoretical Framework Underpinning the Study

The researcher engaged the conceptual frameworks from the SANC as reinforcement in the development of midwifery guidelines because this is the legislative body that govern and ensure the execution of nursing and midwifery care that reduces health risks and promote quality care to all. This is the body that also promulgate and approve models of care that promote quality health care in South Africa. The researcher selected the Nursing Act No 33 of 2005; the SANC Nursing and Midwives Scope of Practice R. 2598; the SANC regulation relating to the conditions under which registered midwives and enrolled midwives may carry on their profession R. 2488; the SANC competencies of a Midwife (Midwifery Practice Model) and the WHO Guideline Development Model (SANC, 2005).

2.8.1 Nursing Act No. 33 of 2005

This Act regulates the nursing and midwifery profession, serves and protects the public, upholds and maintains professional and ethical standards within nursing and midwifery and promotes strategic objectives in matters of improving health, nursing and midwifery practice (SANC, 2005). In nursing and midwifery, it regulates training, research, registration and practice. In training, the Act makes sure that all learners are registered and placed in facilities that are registered and approved for quality nurse and midwife training. The clinical facilities used for training must be approved and subjected to review every 5 years or when need be to ensure quality education. The Act provides guidelines for continuing education and research to ensure that care provided is current, evidence-based and on par with continuing changes in the burden and pattern of disease. This is done to make sure that all practitioners meet the requirements. All facilities that do not meet requirements are closed until they apply for new accreditation. The professionals who are not on par with the requirements are removed from the practice roll to protect the public and to ensure that competency is maintained, hence protecting the public (SANC, 2005).

2.8.2 SANC Nursing and Midwives Scope of Practice R. 2598

Chapter 3 of this scope outlines the guidelines under which a registered midwife executes her duties. The scope entails scientifically-based acts or procedures applied to the practice of midwifery and related care to mother and child during pregnancy, labour and puerperium, neonate and childcare. This model or framework guides midwives on diagnosis of health needs, identifying deviation from normal health and facilitate attainment of optimum health of pregnant woman through all stages until 6 weeks after delivery, guides the midwives on collaboration with and obtaining assistance from other health care team members, including doctors, and other registered persons, administering of medications and or treatment prescribed by medical practitioners (SANC, 1984)

The midwives scope includes guidelines on identification, prevention and management of all diseases related to pregnancy, labour and puerperium; counselling of individuals or groups on family planning for child spacing and reducing risks of preterm birth and death; monitoring the health of mother and baby to achieve optimum health for both. The midwife is responsible of reducing risks of complications relating to pregnancy, labour and puerperium, including preterm births and deaths. A midwife is guided on how to identify signs of perineal tears and perform episiotomy to reduce complications which also include head injury in preterm babies, head injuries predispose preterm babies to hypoxia and asphyxia which are the most fatal complications to preterm babies (SANC, 1984). A midwife is expected to administer local anesthesia in performing and suturing of episiotomy as well as first- and second-degree tears. Administering of medications to mother and the baby, promote and maintain physical comfort and hygiene of both mother and baby.

In case of dehydration as the skin of preterm babies is permeable, a midwife administers fluid and electrolytes as well as acid-base balance. In case of hypoxia, a midwife can administer oxygen to prevent neonatal and foetal complications. Preterm infants' skin is fragile and predispose them to infection, a midwife is supposed to provide care that reduce skin injuries or breakage and reduce infection and, in case of infection, administer antibiotics per doctor's prescription. Preterm infants are prone to nutritional deficiency due to poor suckling reflex and immature gastrointestinal tract. A midwife is guided on maintenance of breastfeeding, that is, cup and spoon feeding can be done doing strict intake and output for proper maintenance of nutritional status. A midwife is also guided on how to maintain maternal mental health and reduction of stress to gain cooperation as the preterm baby will need the full mental stability of the mother to reduce foetal and neonatal complications (SANC, 1984).

2.8.3 SANC Regulation Relating to the Conditions Under Which Registered Midwives and Enrolled Midwives May Carry on Their Profession R. 2488

This model or framework in continuation from scope of practice outlines the circumstances under which a competent midwife provides care that reduces complications starting from pregnancy, labour and puerperium, including preterm birth and deaths.

2.8.3.1 Equipment and Materials

A midwife needs to keep in store intravenous infusion sets and vacolitres at least 2X 1000 ml of 5% dextrose, saline and in case of newborn 2X 200 ml of half strength Darrow's solution. Equipment and materials needed for episiotomy or first- and second-degree tears of perineum. In the case of neonatal care equipment for helping baby breathe, for example, mask and bag, oxygen and prewarmed incubator need to be included. The equipment will assist the midwife in case of emergency and reduce stress to a midwife as all will be in place (SANC, 1990).

2.8.3.2 Record Keeping

A midwife must keep clear and accurate records of the progress of pregnancy, labour and puerperium, including emergencies. This implies that a midwife records the assessment and identified problems, all management administered to keep a track record and to give report during handing over of report. The records will be produced as a proof of care and assist other care providers to have the used regimen and be able to switch to the second line regimen until the mother and baby receive accurate and proper care that reduce risks and maintain optimal health (SANC, 1990).

2.8.3.3 Breast Feeding

The framework promotes breastfeeding unless there is contraindication. In case of preterm babies, breast milk is a key nutrient as it is readily available and is easily

digested in the immature gut. Breast milk also provides the baby with first immunization and prevent infections which are common in a preterm due to an immature immune system (SANC, 1990).

2.8.3.4 Antenatal Period

A midwife attends to a pregnant woman from the first trimester to the third trimester and identify all risks and refer to the medical doctor or the relevant health team member. All conditions like hypertensive disorders, anaemia, convulsions and others which could have adverse effects on the baby like preterm, need to be referred to a medical practitioner (SANC, 1990). In case of a mother falling pregnant for the first time, do pelvic assessment and take blood tests to rule out all medical conditions that may complicate pregnancy, labour and puerperium. A midwife needs to arrange the follow-up visit and see the pregnant woman at least 5 times or more before labour begun to monitor deviation from normal, hence preventing preterm births and deaths. If it is not possible, the midwife needs to explain as this forms part of non-compliance and jeopardize the competency thereof (SANC, 1990).

2.8.3.5 Labour

A midwife attending the woman in labour needs to stay with the patient from the period of confinement until delivery of the baby. In case of preterm labour, a midwife can stop the contractions using prescribed tocolytics to save the life of premature babies. If is not possible to stop labour, the midwife shall stay with the patient until after the delivery of the neonate (SANC, 1990).

2.8.3.6 Puerperium

During these stages, a midwife attends to the mother and child to make sure that both are in stable conditions and to identify all complications that would need the medical practitioner before discharge. After the discharge, the midwife attends to the mother

and baby daily at home until 5 days and, in case of HIV exposure, needs to refer them back to hospital after three days for screening and enrolment to the PMTCT programme. The midwife should teach the mother to care for and identify complications from the newborn baby and report to the clinic to avoid adverse effects, as well as teach the mother to prepare the oral rehydration and replace fluids in case of diarrhoea and dehydration (SANC, 1990).

2.8.3.7 Medical Assistance

In case of any illness and complications occurring to the mother and baby, a midwife shall in agreement with the mother call in a medical practitioner or refer to a medical practitioner during pregnancy, labour and puerperium as well the newborn baby (SANC, 1990).

2.8.3.8 SANC Competencies of a Midwife and Midwifery Specialist Model

This is a specialized field with a focus on expanded roles and competencies to improve maternal health, reproductive health and neonatal or child health. The model distinguishes principles and concepts in five domains which are also applicable to basic midwifery. A Specialist Midwife operates where childbearing families are, including home, community, primary health care setting clinics and obstetric units and other health establishments (SANC, 2014).

2.8.3.9 Continuum of Care

Midwife (specialists) recognized as responsible professionals working in partnership with women, especially the high risk, conducts births and provide care for them. The care includes assessment, screening and preventive actions, detection of complications, referral and accessing of higher medical care and carrying out emergency measures (SANC, 2014).

2.8.3.10 Domains

The model distinguishes principles and concepts in five domains which are also applicable to basic midwifery as follows:

❖ **Domain 1: Professional, Ethical And Legal Practice**

Advocates for professionalism which includes midwifery philosophy and model of care in all aspects of care, acting as role models, fosters and strengthens personality traits that promote quality midwifery care, support and encourage team work to promote excellence, engage in policy development and conduct auditing to promote good midwifery standards and reduce complications including preterm births and deaths. Ethical and legal practice as outlined in R. 2598 and R. 2488 discussed above (SANC, 2014).

❖ **Domain 2: Clinical Practice: Care Provision and Management**

This domain emphasizes the assessment of women and identifies the problems, prioritizes the problems according to their state of agency, provides a plan or strategy to minimize the risks and strategizes the efficient integrated implementation or execution of care using critical thinking and specialized high-quality care. This includes implementing from basic antenatal care(BANC), essential steps in managing obstetric emergencies (ESMOE), kangaroo mother care (KMC), and Integrated Management of Childhood Illnesses (IMCI). Evaluate care given and re-plan, promote therapeutic communication and relationship (SANC, 2014).

❖ **Domain 3: Personal and Quality Care**

A midwife needs to improve quality by implementing evidence-based care or new knowledge from research, prepare and conduct perinatal morbidity and mortalities meetings, utilize information from statistics to improve care, provide environment of continuing education by planning and implementing in-service training of maternity staff according to identified need, .plan and attend workshops, conferences or

meetings to keep up to date with new updated evidence-based practice (SANC, 2014).

❖ **Domain 4: Management and Leadership**

A midwife needs to show understanding of strategic plans, review and develop theories and model of care, demonstrate effective planning, critical thinking and act as consultant for other midwives (SANC, 2014).

❖ **Domain 5: Research**

A midwife needs to demonstrate an understanding and application of terminology, techniques and participate in and implement a research project, implement evidence-based information and care principals within Midwifery, use relevant health statistics, understanding of the importance of changes in statistics and social changes, according to changes of health care needs (SANC, 2014).

2.9 Summary

The literature revealed the challenges of preventing the occurrence of preterm births and deaths. The challenges were linked to poor implementation of the available guidelines, especially in resource-limited countries, including South Africa. Research had been keenly conducted on guidelines or recommendations to reduce preterm birth and death with little or no improvements. Other research reports indicated challenges faced by midwives in resource-limited countries, most likely the sub-Saharan region. There are less specific midwifery-related guidelines to prevent preterm births and deaths. In South Africa, there is no database for midwifery-centred guidelines. Hence, this study sought to develop midwifery practice guidelines to promote the provision of quality care of preterm babies in an environment with limited resources in the obstetric units of the Limpopo Province. Though there were standards frameworks and recommendations to improve preterm birth outcomes, however there was still a burden of preterm birth and death worldwide hence the importance of this study.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

This chapter addresses the approach, design, population, sampling procedure and technique, sample size, data collection methods, data processing and analysis of the study. The study used convergent parallel mixed method and WHO (PICOS & GRADES) model to develop midwifery practice guidelines to promote quality care for preterm babies in resource-limited obstetric units of the Limpopo Province in South Africa. The qualitative and quantitative approaches were conducted in parallel and results were integrated to develop the guidelines (Creswell & Clark, 2011).

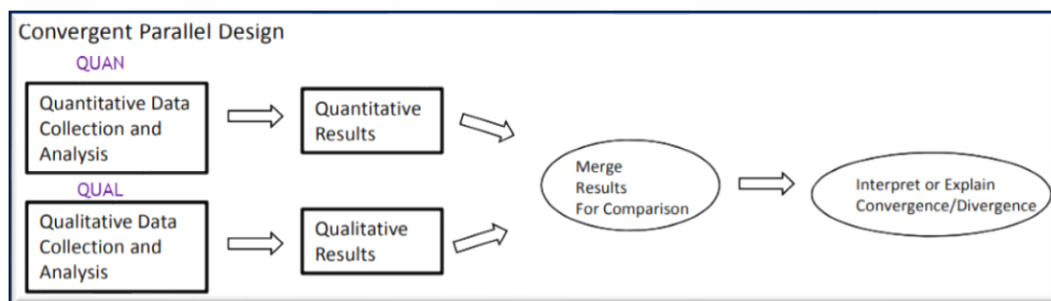
3.2 Mixed Method Design

Research design is a procedure for collecting, analyzing, interpreting, and reporting data in a research study (Creswell & Clark, 2011). It is research where researchers mix or combine quantitative and qualitative research techniques, methods, approaches, concepts or language into a single study (De Vos *et al.*, 2011). Therefore, in this study, the convergent parallel mixed method design was used.

3.3 Convergent Parallel Mixed Method Design

The convergent parallel mixed method design is a phase wherein the researcher collects and analyzes qualitative and quantitative data in the same phase, and merges findings, this is a side-by-side approach with comparison of data in the interpretation and discussion phase (Creswell & Clark, 2011). According to Polit & Beck (2008), the convergent parallel mixed method design is the concurrent equal priority mixed

method design in which different, but complementary qualitative and quantitative data are gathered about the central study and can be also called triangulation (Figure 3.1).



Creswell & Clark (2011); In this study, Qualitative is symbolized as QUAL and Quantitative as QUAN.

Figure 3.1: Convergent parallel mixed method process

In this study, the researcher used the convergent parallel mixed method design because of the following advantages:

- 🔦 The approach allowed the researcher to use of multiple worldviews or paradigms for greater assortment of divergent views and perspectives and alerted the researcher to possibilities and issues. It combined inductive and deductive reasoning.
- 🔦 It allowed the researcher to develop a life skill programme and instrument to measure its effectiveness based on the qualitative information.
- 🔦 It provided strength that offsets the weaknesses of both qualitative and quantitative designs and, therefore, had provided better inferences.
- 🔦 Inclusion of the quantitative component allowed triangulation and made it acceptable to quantitative biased audience (De Vos *et al.*, 2011; Creswell & Clark, 2011).
- 🔦 The other intention was to merge the results from quantitative and

qualitative databases to provide a different insight.

- 🔦 The combination contributed to seeing the problem from multiple angles and multiple perspectives (Creswell & Creswell, 2017)

Table 3.1 summarizes the research process followed in this study.

3.4 Study Setting

The study was conducted in district hospitals of the Limpopo Province, South Africa. Limpopo Province has five (5) districts, Vhembe district, Waterberg district, Mopani district, Sekhukhune district and Capricorn district (Figure 3.2 and Table 3.2). The province is considered to be the most rural. It borders Botswana, Mozambique and Zimbabwe. The five districts have 30 district hospitals. The researcher selected 3 districts of Limpopo Province, South Africa. All 30 district hospitals have neonatal units with bed occupancy ranging from 3-10 beds in the premature units. The actual selected districts included Vhembe district, Sekhukhune district and Capricorn district.

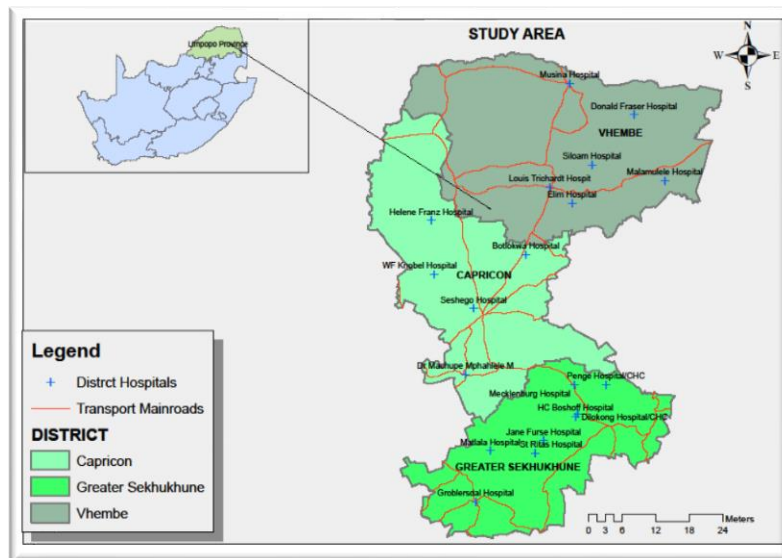


Figure 3.2: Map showing selected districts and district hospitals

Table 3.1: Outline of the research process

Study phase	Method	Objectives	Participants	Data collection method	Data analysis	Results
Phase 1	Qualitative enquiry	<ol style="list-style-type: none"> 1. Explore the role of midwives in saving the lives of preterm babies during antenatal (ANC), intrapartum, resuscitation and postnatal at resource-limited obstetric units of Limpopo Province, South Africa. 2. Identify challenges faced by midwives in promoting quality life of preterm babies, hence save the lives of preterm babies. 	Midwives and managers	Face-to-face in-depth Interviews	Tesch's method	<p>Midwives could execute their roles.</p> <p>Situations not enabling midwives to execute their role were described.</p>
	Quantitative study	<ol style="list-style-type: none"> 3. Assess the support provided by the managers in supervising midwives' role of saving the lives of preterm babies during antenatal (ANC), intrapartum, resuscitation and postnatal at resource-limited obstetric units of Limpopo Province, South Africa. 	Managers and midwives	Measurement scale (Likert) (summated rating scale which can range between 3 to 10-point scores)	Statistical analysis, tables and graphs	There was poor management support of midwives.
Phase 2	WHO guidelines	<ol style="list-style-type: none"> 4. Develop midwifery practice guidelines that will assist midwives to save the lives of preterm babies in Limpopo Province. 	Data from midwives and managers	PICOS = Population, Intervention, Comparator, Outcomes and study design & GRADE = grading of recommendations, assessment, development and evaluation	WHO guidelines	Eight (8) recommendations were suggested and guidelines for each was enlisted.
	Quantitative methodology	<ol style="list-style-type: none"> 5. Validate the developed midwifery practice guidelines. 	Midwives and managers	Criterion/merit checklist	Statistical analysis	More than 70% agrees that the guidelines can be implemented.



The districts were selected because they had a high rate of premature births and deaths.

Table 3.2: District hospitals in Limpopo Province

Capricorn District
<ol style="list-style-type: none"> 1. Botlokwa 2. Dr Machupe Mphahlele 3. Helen Franz 4. Seshego 5. Voortrkker 6. WF Knobel
Vhembe District
<ol style="list-style-type: none"> 1. Donald Fraser 2. Elim 3. Louis Trichardt 4. Malamulele 5. Musina 6. Siloam
Sekhukhune District
<ol style="list-style-type: none"> 1. Dilokong 2. Groblersdal 3. HC Boshoff 4. Macklenberg 5. Matlala 6. St Ritas

3.5 Phase 1: Qualitative Approach

3.5.1 Objectives

-  Explore the role of midwives in saving the lives of preterm babies during antenatal (ANC), intrapartum, resuscitation and postnatal care at resource-limited obstetric units of the Limpopo Province, South Africa.
-  Identify the challenges faced by midwives in promoting quality life of preterm babies, hence save the lives of preterm babies.





3.5.2 Exploratory

According to Grove *et al.* (2014), explorative studies examine relatively unknown phenomena in order to gain new insights to understand the phenomena with the aim of determining priorities for further research. In this study, the researcher explored the roles of midwives as well as the support needed by midwives to provide quality care to preterm babies.

3.5.3 Descriptive

According to Polit & Beck (2008), descriptive studies describe and document aspects of the situation as it naturally occurs and may serve as a starting point to generate or develop theory. In this study, the researcher provided the participant with a scale that allowed the participants to describe the role and support for midwives to provide quality care to preterm babies.

The approach was chosen because of the following reasons:

-  The type of design is flexible and unique and evolves throughout the research process; the design has no fixed steps to be followed and cannot be easily replicated;
-  It allows for merging of various data collection strategies (triangulation) and requires the researcher to be intensively involved, or remain in the field for a long period, and become a research instrument;
-  The unit of analysis in this design is holistic, striving for an understanding of the whole.
-  The design ensures that the study is done in natural settings where respondents narrate their lived experience (Delport *et al.*, 2011).

3.5.4 Research Population

The target population is the entire set or aggregation of objects, persons, behaviour or events, or any other single unit of a study sometimes called element of single unit that meet a sampling criterion (Botma *et al.*, 2010). Accessible population is a portion of the target population to which the researcher has reasonable access (Grove *et al.*, 2014). In this study, the target population were all midwives and managers in the maternity units of the Limpopo Province whilst the accessible population were the midwives from the three selected districts.

3.5.4.1 Sampling of Facilities/District Hospitals

The researcher purposively selected the hospitals with high preterm birth and death rates (Table 3.3).

Table 3.3: District hospitals sample frame N = 18 and sample size n = 12

District hospitals	Number of hospitals	%	Number of selected hospitals	Number of preterm birth/district	Number of neonatal deaths due to prematurity/district
Capricorn 1. Botlokwa 2. Dr Machupe Mphahlele 3. Helen Franz 4. Seshego 5. Voortrekker 6. WF Knobel	6	80	1. Botlokwa 2. WF Knobel 3. Helen Franz 4. Seshego	48 463	1 461
Vhembe 1. Donald Fraser 2. Elim 3. Louis Trichardt 4. Malamulele 5. Musina 6. Siloam	6	80	1. Donald Fraser 2. Elim 3. Siloam 4. Malamulele	56 438	1 274
Sekhukhune 1. Dilokong 2. Groblersdal 3. HC Boshoff 4. Macklenberg 5. Matlala 6. St Ritas	5	80	1. Groblersdal 2. Dilokong 3. Matlala 4. St Ritas	41 724	1 173
Total	18	80	12	146 625	3 908

3.5.4.2 Sample

Sample denotes the selected group of people or elements included in a study (Grove *et al.*, 2014). In this phase, the sample was the midwives and managers selected from Capricorn, Vhembe and Sekhukhune districts.

3.5.4.3 Sampling

Sampling is a process of selecting a group of people, events, behaviour or other elements with which to conduct a study (Grove *et al.*, 2014). De Vos defined sampling as a process of selecting a group of people, events, behaviour or other elements that are representative of the population that is being studied which includes probability and non-probability methods (De Vos *et al.*, 2011). In qualitative research, the non-probability method is commonly used. In non-probability sampling, the researcher does not know the members of the population (De Vos *et al.*, 2011). In this phase, non-probability sampling was used because not all individuals had equal opportunity to participate, as the researcher did not know the odds of selecting participants. Purposive sampling was used to select midwives and managers who were willing and had 12 months or more working experience in the maternity units of the district hospitals of the Limpopo Province.

3.5.4.4 Population

The midwives and managers working in obstetric units of the 12 selected district hospitals were included in the study.

3.5.4.5 Inclusion Criteria

This refers to the characteristics that a participant or element must possess to be part of the target population (Grove *et al.*, 2014). In this phase, all midwives and managers who were willing to participate and had 12 months or more working experience in the maternity units of selected district in the Limpopo Province formed part of the study.

3.5.4.6 Sample Size

The sample size in this qualitative research was determined by the scope of the study, saturation of information given and quality of the data collected (Grove *et al.*, 2014). In this study, midwives allocated in the obstetric units of the selected district hospitals were selected to participate in the study. From the 12 selected district hospitals, a total of 83 midwives participated in the study. This number included 15 midwives and managers who participated in in-depth one-to-one interviews, 55 midwives and managers who answered the summated rating scale, and 13 midwives who participated in validation of the study.

3.5.5 Data Collection

Data collection is the precise, systematic gathering of information relevant to the research purposes or specific objectives, question, or hypothesis of the study (Grove *et al.*, 2014).

3.5.5.1 Plan for Data Collection





The researcher received ethical clearance from the University of Venda (Annexure 1) and was granted permission to conduct the study from the Limpopo Province Department of Health, the 3 selected districts and the 12 selected district hospitals (Annexures 2A-2C, 3A-3D). After the responses from all the stakeholders, the researcher phoned the managers to secure a meeting for arranging a convenient time to conduct interviews and administering of the summated rating scale. In that meeting, the participants were briefed on the procedure of interviews, risks and benefits was also included, the use of tape recorder was explained to prepare them and to avoid unnecessary confusion (Annexure 4A).

3.5.5.2 Data Collection Method

- ❖ In-Depth One-To-One Interview

In-depth interviews assisted the researcher to clarify some concepts; to get meaning of some statements in relation to the midwifery practice guidelines. Furthermore, the researcher asked some participants to elaborate some statements in order to get clarity and avoid misunderstandings (Henning *et al.*, 2004)

The researcher used the following communication techniques throughout:

-  **Paraphrasing:** the researcher expressed clearly and concisely what had been said with the aim of conveying to the participant that she was with him/her and that she understood what s/he was explaining. On the other hand, the researcher checked her own perceptions to make sure that she really understood what the participant was describing.
-  **Summarizing:** this allowed the researcher to condense and crystallize the essence of the participant's statement.
-  **Probing:** during interviews, the researcher requested more information from the participants who made vague comments that could have multiple meanings.
-  **Listening:** the researcher listened carefully to the participants' messages and responded to the meaning behind these messages accurately. This enhanced the quality of interviews.

3.5.5.3 Process of Data Collection

In this phase, the researcher was the main data collector. In-depth one-to-one interviews were conducted with midwives and managers. A semi-structured interview guide was used (Annexure 5). Arrangements were made with the selected hospitals to use side wards and duty rooms to conduct the interviews. Interviews were conducted during lunch time and an interview took 15-20 minutes. An interview

guide/schedule was developed according to the area of interest.

For example, exploring the role of midwives in saving the lives of preterm babies within resource-limited obstetric units of the Limpopo Province or identifying the challenges faced by midwives in promoting quality life of preterm babies and, hence, save the lives of preterm babies. Tape recording of the interviews was done in agreement with the participant to ensure precise capturing of the data. Field notes were taken to capture the things that had been seen, heard, and experienced to minimize loss of data (De Vos *et al.*, 2011). Data collection took 24 weeks (6 months) starting from December 2016 to May 1017, followed by analysis and development of the guidelines until December 2017.

3.5.6 Data Analysis

This is conducted to reduce, organize and give meaning to data (Grove *et al.*, 2014). This is a process of converting data to numerical form and subject it to statistical analysis, which is a procedure of assembling, classifying, tabulating and summarizing numerical data to obtain meaning or information. Qualitative data were transcribed verbatim and themes, sub-themes were deduced from the participants' rich data ((Delpont *et al.*, 2011). In this study, qualitative data were analyzed with non-numerical assessment of observations made through in-depth one-to-one interviews. Data were analyzed using Tesch's 8 steps of open-coding (Creswell, 2014). The following steps as described by Creswell (2014), were followed during data analysis:

❖ Step 1-Reading Through the Data

The researcher got a sense of the whole by reading all the verbatim transcriptions carefully. This gave ideas about the data segments and how they look like/mean. The meanings that emerged during reading were written down and all ideas as they came to mind. The researcher carefully and repeatedly read the transcripts of all the participants and understood them. An uninterrupted period to digest and thought about

the data in totality was created. The researcher engaged in data analysis and wrote notes and impressions as they came to mind.

❖ Step 2-Reduction of the Collected Data

The researcher scaled down the data collected to codes based on the existence or frequency of concepts used in the verbatim transcriptions. The researcher then listed all topics that emerged during the scaling down. The researcher grouped similar topics together, and those that did not have association were clustered separately. Notes were written on margins and the researcher started recording thoughts about the data on the margins of the paper where the verbatim transcripts appeared.

❖ Step 3-Asking Questions About the Meaning of the Collected Data

The researcher read through the transcriptions again and analyzed them. This time the researcher asked herself questions about the transcriptions of the interview, based on the codes (mental picture codes when reading through) which existed from the frequency of the concepts. The questions were “Which words describe it?” “What is this about?” and “What is the underlying meaning?”

❖ Step 4-Abbreviation of Topics to Codes

The researcher started to abbreviate the topics that emerged as codes. These codes needed to be written next to the appropriate segments of the transcription. Differentiation of the codes by including all meaningful instances of a specific code's data were done. All these codes were written on the margins of the paper against the data they represented with a different pen colour as to the one in Step 3.

❖ Step 5-Development of Themes and Sub-Themes

The researcher developed themes and sub-themes from coded data and the associated texts and reduced the total list by grouping topics that related to one another to create meaning of the themes and sub-themes.

❖ Step 6-Compare the Codes, Topics and Themes for Duplication

The researcher, in this step, reworked from the beginning to check the work for duplication and refined codes, topics and themes, where necessary. Using the list of all codes she checked for duplication. The researcher grouped similar codes and recoded others where necessary so that they fitted in the description.

❖ Step 7-Initial Grouping of All Themes and Sub-Themes

The data belonging to each theme were assembled in one column and a preliminary analysis was performed, which was followed by the meeting between the researcher and co-coder to reach consensus on themes and sub-themes that each one has come up with independently.

❖ Step 8-Recoding, if Necessary

A necessity to recode emerged as some of the themes reached independently were merged.


3.5.7 Measures to Ensure Trustworthiness


The root of this was first outlined and published by Guba (1981) who raised four (4) concerns that any researcher using a qualitative study needs to address or attend to (Anny, 2014). Trustworthiness is concerned with how the researcher established confidence and what made the findings genuine which is the truth value. How did the researcher determine applicability or transfer the findings to other settings/ participants? How would one achieve consistency or repeat the study with the same participants and get the same results? Lastly, how would one be sure that the findings came solely from participants and the investigation was not influenced by biases and interests of the researcher? (Anny, 2014).


3.5.7.1 Credibility


This is the confidence in the truth of the data and interpretation thereof. Lincoln &

Guba as cited in De Vos *et al.* (2011) pointed out two aspects: first, carrying out the study in a way that enhances the believability of findings, and second, taking steps to demonstrate credibility to external readers. In this study, credibility was established by:

 **Prolonged engagement in the field:** the researcher had immersed herself in the world of the participants to gain insight into the context of the study and minimize distortions of information and this helped to understand core issues that may affect the quality of data and to developed trust with participants (Anny, 2014).

 **Use of peer debriefing:** the researcher sought support from other professionals, including the postgraduate dissertation committees, promoters and core-promoters who gave comments and expert perceptions before the conclusion of the study (Anny, 2014).

 **Triangulation:** the researcher used research assistants, i.e., the use of multiple researchers which afforded different perceptions and strengthened the integrity of the findings. There was employment of multiple instruments to collect data, i.e., in-depth one-to-one, summated rating scale or structured questionnaires and multiple methodological triangulation, i.e., qualitative and quantitative methods to obtain corroborating evidence (Anny, 2014).

 **Member checking:** the researcher interpreted, and tested data as derived from members of various audiences and groups from which data were solicited and voices of the respondents were included to minimize biases. Analyzed and interpreted data were sent back to participants to evaluate if they were misreported (Anny, 2014).

 **Negative case analysis:** the researcher reported issues that contradicted

the researcher's ideas and beliefs (Anny, 2014).

3.5.7.2 Dependability

This is the stability/reliability of data over time and over conditions. The primary question is: will the findings of the study be repeated if it were replicated with the same participants in the same context (De Vos *et al.*, 2011). In this study, the researcher did:

- 🔦 **Audit trail:** The researcher kept a detailed record of the decisions made before and during the research and description of the research, and documented non-verbal communication during in-depth one-to-one interviews to enrich the data (De Vos *et al.*, 2011).
- 🔦 **Stepwise replication:** the researcher and the supervisor analyzed the data separately and then compared the results for inconsistencies; these were addressed to improve dependability and if there were similarities, then dependability was achieved (Anny, 2014).
- 🔦 **Code-recode strategy:** the researcher coded the data twice, giving a period of one or two weeks in between if the codes were similar then dependability was achieved (Anny, 2014).
- 🔦 **Peer-examination:** the researcher discussed the findings with a neutral colleague to assist with honesty and in identifying categories not covered and negative cases (Anny, 2014).
- 🔦 **Theoretical/purposive sampling:** the researcher selected key informants who are knowledgeable on the issue under investigations, for example midwives and managers (Anny, 2014).

3.5.7.3 Transferability

This refers essentially to the generalizability of the data, the extent to which the findings can be transferred in other settings or groups (De Vos *et al.*, 2011). In this study, the researcher did thick description of the methodology selected and provide sufficient/thick descriptive data context and report so that consumers can evaluate the applicability of data to other contexts.

The researcher also did triangulation of data collection method, i.e., in-depth one-to-one interviews and summated rating scale. The use of more than one data collection method enhanced transferability. Data from different sources were used to collaborate, elaborate or illuminate the research question (De Vos *et al.*, 2011). Data were collected from managers and practicing midwives in the selected district obstetric units.

3.5.7.4 Confirmability

This refers to the objectivity, the potential for congruency between two or more independent people about the data accuracy, relevance or meaning. This is also concerned with establishing that the data represent the information provided by participants and not the researcher's imaginations (De Vos *et al.*, 2011). In this study, the following had enhanced conformability: carefully planned research process, design, sampling and data collection; recording of the participants during interviews; transcribed the raw data from the tape; analyzed raw data and findings through contextualization.

The independent coder analyzed the transcripts, review raw data, tape recorder as well as written field notes and documented the results independently; checked the representativeness of data, i.e., whether the researcher had indeed interviewed all categories of participants needed to get a complete picture of the topic. The draft was presented to the School of Nursing for corrections to establish the truth-value of the

data and the supervisor checked the work with the co-supervisor to validate the study (De Vos *et al.*, 2011).

3.6 Quantitative Approach

3.6.1 Objective

- 👉 Determine the support provided by the managers in supervising midwives' role of saving the lives of preterm babies during antenatal (ANC), intrapartum, resuscitation and postnatal care at resource-limited obstetric units of the Limpopo Province, South Africa.

3.6.2 Sampling of Facilities

Sampling of the facilities in this phase was similar to the procedure explained in the qualitative approach above. The same strategy was used to select the district hospitals (Table 3.3).

3.6.3 Population and Sampling Method

3.6.3.1 Population

In this phase, the target population was the managers and midwives in maternity units of the Limpopo Province. The accessible population was the unit managers and midwives in the selected district hospitals with a high rate of preterm births and deaths in the Limpopo Province.

3.6.3.2 Sampling Method

In this phase, non-probability sampling was used, and purposive sampling method was used wherein the researcher had identified the experts which were the managers and midwives of the selected district hospitals. The researcher systematically administered the summated rating scale on both managers and midwives of selected

district of the Limpopo Province (De Vos *et al.*, 2011).

3.6.3.3 Sampling of Participants

Managers and midwives from the three selected districts were selected using the fishbowl technique, and the researcher followed the following steps: numbers representing the participants from a sample frame were written on a separate slip of a paper; slips were placed in the bowl; the slips in the bowl were shuffled; first slip were taken; number on the slip were noted; the slip was replaced and shuffled again; the second slip was selected, replaced and reshuffled; third and so on until the number of the required sample was reached.

3.6.3.4 Sampling/Inclusion Criteria

Managers and midwives in maternity units of Vhembe, Capricorn and Sekhukhune district hospitals in the Limpopo Province formed part of the study. All managers from the district hospitals within the 3 selected districts who were willing to participate were included in the study.

3.6.3.5 Sample Size

According to situational analysis done by the researcher in the training hospitals on 21/04/2015, the number of managers was 3 per maternity unit, i.e., one district hospital had 3 managers. The total managers from the three selected districts were 36. Midwives ranged between 8-12, including night staff and those on leave to make a total of 96 in the 12 selected hospitals, the total midwives and managers were 132. Therefore, 24 managers and 31 midwives in the selected district hospitals formed part of the study to ensure validity and reliability of the study (De Vos *et al.*, 2011).

Table 3.4: Population frame

District	Number of hospitals	Number of managers	Number of midwives	Sample
Capricorn	4	8	12	20
Vhembe	4	4	11	15
Sekhukhune	4	8	12	20
Total	12	24	31	55
N = 132 and sample size n = 55				

3.6.4 Data Collection

3.6.4.1 Plan for Data Collection

The researcher was given the permission by the provincial government, district and the hospital's chief executive officers (CEOs) to conduct the study amongst the managers and the midwives of the selected district hospitals (Annexures 2A-2C, 3A-3D). After obtaining the permission, the researcher phoned the hospitals to secure appointments with them and arranged convenient times with the participants. The researcher arranged for convenient times to meet with the selected participants, preferably during lunch time. Alternatively, the researcher arranged to meet them immediately after knocking off around 16h00 at their hospitals as this was more accessible than meeting with them at their homes. Arrangements to use separate rooms for completion of the measuring scale were made. Some participants completed the rating scale in their offices which was convenient for them.

3.6.4.2 Training of Research Assistants

Considering the scope/setting of the study, the researcher recruited and trained one research assistant who was an ecologist and coordinating environmental services in Limpopo Province and was conversant with the route to Sekhukhune and Capricorn district. The assistant helped the researcher with the distribution and collection of the

rating scales to and from the managers and midwives. The training took three days. It included the following:

- 🔥 **Day 1:** Activities related to the explanation of the rating scale and how to circle the correct option.
- 🔥 **Day 2:** How to explain the procedure to the midwives and managers to get informed consent.
- 🔥 **Day 3:** Field work consisting of demonstrations and return demonstrations with regard to questionnaire administration.

The assistant who fulfilled the following requirements was recruited:

- 🔥 Could speak and write English.
- 🔥 She worked in the areas within the selected district hospitals and was conversant with research as she is an experienced ecologist who do surveys of land rehabilitation and had good working relationships.

3.6.4.3 Data Collection Method

In this phase, the researcher used the summated rating scale to collect data from the managers and midwives.

❖ Likert Scale (Summated Rating Scale)

The Likert scale, sometimes called the summated-rating scale, is most commonly used, and consists of several declarative expressive viewpoints in a topic (Polit & Beck, 2008). A Likert scale is composed of a series of four or more Likert-type items that represent similar questions combined into a single composite score/variable (Boone & Boone, 2012). In this study, the researcher used a Likert scale with four items and had removed Neutral from the scale. This was done following a

recommendation in one study suggesting that inclusion of no-opinion/neutral options in the Likert scale may not enhance data quality and instead may prevent measurement of some meaningful opinions (Krosnick *et al.*, 2002).

❖ Advantages

It measures values and attitudes towards the phenomenon and is commonly used in clinical practice to measure the degree of quality care (Polit & Beck, 2008). The researcher also used the trained data collector to distribute questioners and assist participants on how to complete the questioners. The scale was in English, but the researcher/assistant researcher was available when participants were completing the questionnaires for clarity in case the participants were not clear on certain aspects of the instrument (Annexure 6).

3.6.4.4 Process to Collect Data

The research assistant met with the researcher on the agreed date, time and place. She distributed questionnaires to participants and explained the process of completing them. She remained in the cubicle/office to clarify to the participants' issues that may not be clear. The time taken to complete the questionnaire was 30-45 minutes. After the completion, the assistant collected the questionnaires. The researcher took 6 months collecting data due to distance from district to district and road conditions as most districts were found in the rural areas of Limpopo Province.

3.6.5 Data Analysis

Quantitative data were analyzed through descriptive statistics, was reduced, summarized, organized, evaluated, interpreted and communicated. Then data were condensed and organized into visual representation or pictures, tables and graphs (Brink *et al.* 2012). In this study, data were analyzed through the computerized Statistical Package for the Social Science (SPSS) programme version 23. Graphs and

tables were used to help the researcher in describing and explaining the data.

3.6.6 Validity

Validity is the ability of an instrument to measure the variable that it is intended to measure (Brink *et al.*, 2012). It seeks to ascertain whether the instrument accurately measures what it is supposed to measure given the context in which it is applied (Brink *et al.*, 2011). In this study, the researcher conducted a pilot study in Vhembe district to test the instrument before undertaking the study, a total of 5 midwives completed the rating scales. The literature review and results from the pilot analysis was used in the modification of the instrument to make sure that it adequately measures the study variables. Supervisors as well as the statistician assisted with the modification of instrument. After modification, the instrument was used to collect data from the selected participants.

3.6.6.1 Content Validity

Content validity is an assessment of how well the instrument represents all the components of the variable to be measured (Brink *et al.*, 2012). In this study, the researcher firstly conducted an in-depth literature review to reveal the essential aspects of the variables to be included in the development of the questionnaire. Secondly, the rating scale was submitted to experts who were the promoters and co-promoters as well as statistician to check the feasibility of the instrument before the real study was conducted.

3.6.6.2 Internal Validity

The researcher chose participants randomly and ensured that the sample size was sufficiently large to close the gap that can result from attrition (Grove *et al.*, 2014).

3.6.7 Reliability

Reliability refers to the degree to which the instrument can be depended upon to yield consistent results if used repeatedly over a time on the same person or if used by two researchers (Brink *et al.*, 2012; De Vos *et al.*, 2011). In this study, the researcher conducted a pilot study (test-retest) and distributed the same rating scale to 5 participants; and was sure that all items on the instrument measured the same variables.

3.6.8 Applicability

To ensure applicability, the researcher applied the instrument to the same group of participants 2-3 times, and they gave the same ratings 2-3 times, meaning that the instrument was consistent and was reliable (Brink *et al.*, 2012; De Vos *et al.*, 2011).

3.7 Phase 2: WHO Guidelines and Quantitative Approach

3.7.1 Objective

- 🔦 Develop midwifery practice guidelines that will promote provision of quality care to preterm babies

3.7.2 Development of Midwifery Practice Guidelines

A guideline is any document containing recommendations about health interventions, whether these are clinical, public health or policy recommendations. The recommendations were intended to assist providers and recipients of health care and other stakeholders to make informed decisions and produce interventions that will have an impact on health and that will have implications for the use of resources (WHO, 2012). The researcher applied the globally accepted guidelines model to develop effective clinical guidelines as outlined by (WHO 2012). WHO outlined the following 10 steps (Figure 3.3):

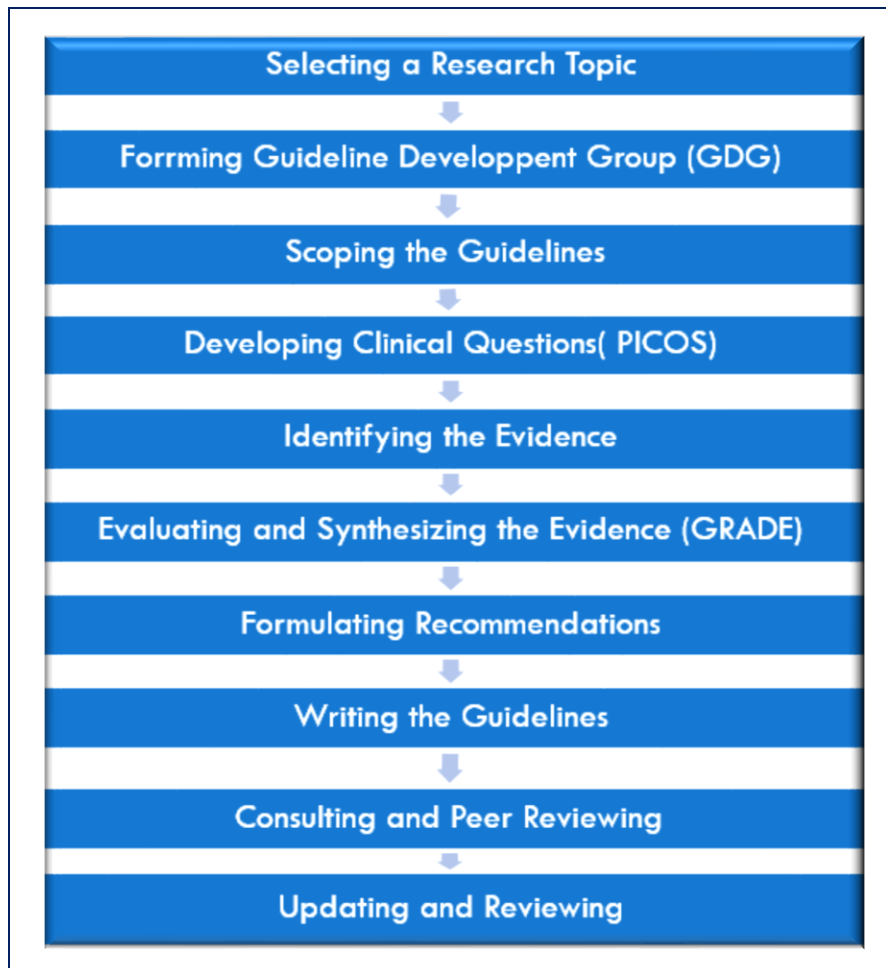


Figure 3.3: WHO Guideline development process

3.7.2.1 Selecting a Topic

In this study, the topic was: “Developing midwifery practice guidelines to promote quality care of preterm babies in resource-limited obstetric units of Limpopo Province in South Africa”.

3.7.2.2 Forming the Guideline Development Group

The expert group included managers and midwives in the obstetric units in the Limpopo Province. The 10 midwives and 3 managers from the selected obstetric units of Vhembe district formed the group to develop the guidelines. From the 3 managers, 1 was a coordinator for maternal health at the district office, 1 was a coordinator for child health at the district office and 1 was the operational manager maternity section,

from the 10 midwives 1 was an advanced midwife and 9 were midwives without additional speciality training.

3.7.2.3 The Scoping of the Guideline

The researcher developed the objectives, identified the participants who were midwives and managers, and determined a timeline which was a minimum of 12 months starting from December 2016 to December 2017. The University of Venda funded the study and the study supervisors acted as external advisors.

3.7.2.4 Developing Clinical Questions

The researcher developed the questions using the PICOS model (Figure 3.4):

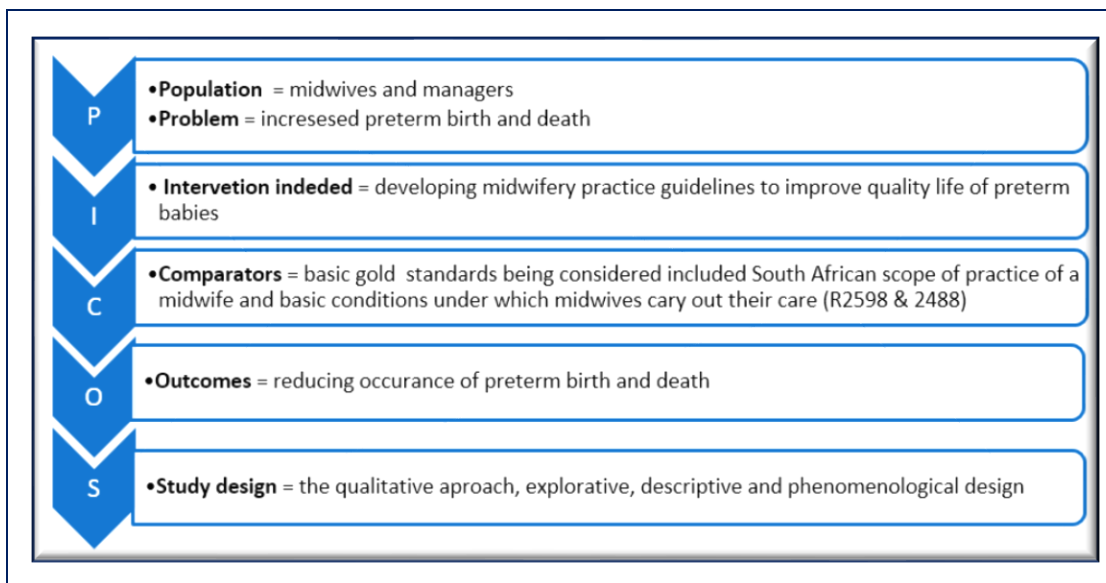


Figure 3.4: The PICOS model

3.7.2.5 Identifying the Evidence

The researcher did a thorough literature review for evidence-based or systematic literature to support and identify the already existing guidelines. The researcher did literature review on the following aspects (see section 2, Literature Review);

- 🔦 Standards for quality maternal and neonatal health care
- 🔦 The role of midwives in provisioning of quality care of preterm babies during antenatal (ANC), intrapartum, resuscitation and postnatal care in the obstetric units.
- 🔦 The challenges faced by midwives in provisioning of quality care of preterm babies during antenatal (ANC), intrapartum, resuscitation and postnatal care in the obstetric units.
- 🔦 Managers support provided to midwives during antenatal (ANC), intrapartum, resuscitation and postnatal care within limited resources in the obstetric units of the Limpopo Province, South Africa
- 🔦 A midwife-centred practice guideline that may assist midwives to provide quality care and reduce the preterm birth and save the lives of preterm babies.

3.7.2.6 Evaluating and Synthesizing the Evidence

Table 3.5 was followed in synthesizing and grading the recommendations.

Table 3.3: The GRADE model

Quality of evidence and strength of recommendations	High	A		Strength of recommendations	Level 1	Corresponds to strong in GRADE
	Moderate	B				
	Low	C			Level 2	Corresponds to weak or discretionary in GRADE
	Very low	D				

The researcher used the literature review to synthesize or develop the title and the abstract of the study. This helped in the introduction and in outlining its relevancy. The study was then critically appraised using specific criteria to assess the quality of the

evidence as indicated in (Table 3.3) and the use of the convergent parallel mixed method methodology to obtain reliable results. In the quantitative approach, the Likert scale was used to collect data. A professional statistician was used to analyse data using SPSS version 23.0 to ensure reliability, and in-depth one-to-one interview was employed, and the independent coder was used to code the data to ensure trustworthiness of the data. Evidence tables and pie charts were used to help collate and summarize the data to identify similarities and differences between studies. Then recommendations were used to develop the guidelines.

3.7.2.7 Formulating Recommendations

❖ Evidence-Based Recommendations

The researcher came up with evidence-based recommendations from the literature reviewed and data analysis. The recommendations formed part of guideline development.

❖ Non-Evidence-Based Recommendations

The researcher also came up with the recommendations from experts that were non-evidence-based recommendations coming from the health care providers—in this case midwives and managers from the selected 12 hospitals.

3.7.2.8 Writing the Guideline

The researcher, promoters and a doctoral fellowship student wrote the guidelines in concrete, unambiguous and specific terms. Guidelines listed the key recommendations and provide audit criteria and, where appropriate, included algorithms or clinical pathways to lead readers through the patient care process. It was written as a short quick reference guide, and long handbook or guideline booklet.

3.7.2.10 Consulting and Peer Reviewing


The researcher subjected the guidelines to extensive peer review prior to widespread dissemination and implementation for comment on the content, validity, clarity and applicability of the guideline. Feedback was considered by the guideline developers and necessary changes were made to the document before final publication. The external reviewers were included, i.e., methodological experts, potential users of the guideline and a clinical expert in the topic area of the guideline. Then the developed clinical guidelines were validated to establish the potential consequences of their implementation.

3.7.2.11 Updating and Reviewing

The researcher also specified a date for updating the evidence base underpinning the guideline recommendations. The researcher considered the recommended three-year period, or the review will be done if new evidence that is likely to influence the recommendations is available, i.e., new study recommendations.

3.8 Validation of the Developed Guidelines

3.8.1 Objective

 The objective was to validate the developed midwifery-centred practice guidelines.

Validation is the process of determining the credibility of the empirical knowledge or process that draws on traditional methods of science to substantiate the accuracy of conceptual meanings in terms of empiric evidence (Chinn & Kramer, 2008). Quinn (2007) explained validation as the process where a proposal for a new programme is examined for suitability or inclusion in the institution's portfolio. In this study, validation was done to test the applicability of the developed midwifery-centred guidelines.

3.8.2 Quantitative Approach

3.8.2.1 Research Design

The non-experimental-intervention validation design was used as this is commonly used in nursing research (Grove *et al.*, 2014). This design was chosen because it is used to test the prototypes in situations and environments similar to the one planned. This was testing of the intervention on a natural situation resembling the one in which the problem had occurred helping the researchers and health care providers to experience how an intervention would work in the actual conditions (Grove *et al.*, 2014).

3.8.2.2 Population

The target population were the midwives and managers working in obstetric units of Vhembe district of the Limpopo Province.

3.8.2.3 Sampling

In this phase, simple random sampling was used following the basic probability technique, where each individual in the population theoretically had an equal chance of being selected for the sample (Grove *et al.*, 2014). The researcher randomly selected 13 midwives from Vhembe district.

3.8.2.4 Sample Size

A total of 10 midwives and 3 managers were selected from Vhembe district hospitals, these midwives did not form part of the empirical study which was phase 1 of the study.

3.8.2.5 Data Collection

The researcher developed a checklist to validate the developed guidelines with the

items described below under applicability of the study. The researcher arranged the workshop wherein the draft of findings and the enlisted guidelines were presented on day 1. On day 2, the midwives and managers were engaged on a discussion about the draft and their inputs were taken and used to further modify the draft. Thereafter, the researcher personally distributed the checklist to midwives and managers selected from Vhembe district hospitals (Annexure 8).

3.8.2.6 Data Analysis

Immediately after validation, the data were statistically analyzed using simple descriptive statistics. Percentages were used to rank the data. These were presented in a frequency distribution table with responses depicted through percentages from highest and lowest.

3.8.3 Validation of the Guidelines

The researcher applied the 6 steps as outlined by Chin & Kramer (2008). These steps were applied to make sure that: the guideline goals and practice goals were congruent and they would assist midwives in their role of provision of quality care to preterm babies; would enhance support provided by the manager in the provision of quality care of preterm babies; share similarity with practice variable; address challenges faced by midwives in the provision of quality care of preterm babies in the obstetric units; the explanations of the guidelines were sufficient to be used as a basis for midwifery action; promote quality care to preterm babies; in line with the research evidence/literature supporting the theory; the users of these guidelines would influence the practical functioning of the neonatal/midwifery units.

To make sure the developed guidelines were useful and in line with practice they were also checked against the appraisal of guidelines research & evaluation (AGREE) reporting checklist which is downloadable from the internet (Annexure 8).

3.9 Ethical Considerations

This is the principle of respect for person, beneficence, and justice. Grove *et al.*, 2014 and Polit & Beck (2008) defined it as a system of moral values that is concerned with the degree to which research procedures adhered to professional, legal and social obligations of the study. In this study, the researcher observed the following major ethical principles:

3.9.1 Permission to Conduct the Study

The researcher sought permission from the Department of Health in the Limpopo Province (Annexure 2A), Vhembe district (Annexure 2B) and a district hospital (Annexure 2C) and received the ethical clearance from the University of Venda Research Ethics Committee (Annexure1). The researcher gave information to participants (Annexure 4A) then made them to sign a consent form before completing the questionnaire (Annexure 4B).

3.9.2 Anonymity and Confidentiality

Anonymity occurs when the researcher cannot link the respondents to their data (Polit & Beck, 2008). Confidentiality is a pledge that any information provided by the respondents will not be publicly reported in a manner that identifies them and will not be accessible to others (Polit & Beck, 2008). Though it is not easy to maintain anonymity in one-to-one interviews, the researcher made sure that the data from the respondents could not be linked to them, no names were used, instead codes were used to identify the respondents, e.g., Midwife 3 from Vhembe district. The researcher made sure that the supervisors from the university and the researcher are the only ones with access to the respondents' information.

3.9.3 Informed Consent (Right to Full Disclosure)

It encompasses people's right to make informed, voluntary decision to participate,

which requires full disclosure, no deception or concealment (Polit & Beck, 2008). In this study, the researcher requested the respondents sign consent forms (Annexure 4B). The researcher explained what the study entailed in full, including risks and benefits (Annexure 4A).

3.9.4 Voluntary Participation and Respect for Human Rights

This encompasses the principle of self-determination, which means that the prospective respondents have the right to decide voluntarily to participate in the study without risk or penalty and they have the right to question, to refuse to give information, or withdraw from the study without risk or prejudiced treatment (Polit & Beck, 2008). In this study, the respondents had the right to participate voluntarily and to withdraw anytime they felt like doing so with no incurred risks.

3.9.5 Freedom from Harm (Protection from Exploitation)

The researcher has an obligation to avoid, prevent or minimize harm, and not subject respondents to unnecessary risks of harm or discomfort. The researcher needs to prevent physical and psychological harm. The study needs to be scientifically and socially safe (Polit & Beck, 2008). In this study, the researcher did not cause harm to the participants, neither physically or emotionally. The researcher disclosed any risk that can be incurred if they participated. The researchers disclosed that there was no direct benefit in the form of money or reward to the respondents.

3.10 Dissemination of the Study Findings

This has to do with publishing or making known the results to the scientific community or public (Botma *et al.*, 2010). The research document will be submitted to the Limpopo Province Department of Health. The results of the will be submitted to peer-reviewed journals and other fora. Oral presentations or posters may be presented at organized conferences (Botma *et al.*, 2010).




CHAPTER 4

PRESENTATION AND DISCUSSION OF THE FINDINGS

4.1 Introduction

The previous chapter presented the research design and methods used in this study. This chapter covers the analysis, presentation and discussion of the results. The purpose of the study was to develop midwifery practice guidelines to promote provision of quality care of preterm babies within limited resources in the obstetric units of the Limpopo Province.

The objectives were to:

-  Explore the role of midwives in the provision of quality care of preterm babies within limited resources in the obstetric units of Limpopo Province, South Africa;
-  Identify the challenges faced by midwives in the provision of quality care of preterm babies in the obstetric units of the Limpopo Province; and
-  Assess the support provided by the manager in the provision of quality care of preterm babies in the obstetric units of Limpopo Province.

The quantitative results were presented first followed by the qualitative results. The quantitative data were analyzed through the computerized Statistical Package for the Social Science (SPSS) version 23.0. Pie charts were used to present demographic data (Section: A), the quantitative results were presented from section B to F using tables. Tesch's eight steps of open-coding were used to analyze qualitative data.

Findings were presented from quantitative approach first followed by qualitative approach since data collection was done using these two approaches

4.2 Quantitative and Qualitative Approaches

The objectives of Phase 1 of this study were firstly to Explore the role of midwives in the provision of quality care of preterm babies within limited resources in the obstetric units of Limpopo Province, South Africa. Secondly, to identify the challenges faced by midwives in the provision of quality care of preterm babies in the obstetric units of the Limpopo Province. Thirdly, to assess the support provided by the manager in the provision of quality care of preterm babies in the obstetric units of Limpopo Province. Both qualitative and quantitative approaches were used to pursue all the objectives, i.e., the parallel convergent mixed method. The fourth objective was to develop midwifery practice guidelines that will promote the provision of quality care to preterm babies despite the limited resources in the obstetric units of the Limpopo Province. The fifth objective was to validate the developed midwifery practice guidelines. The fourth and fifth objective (Phase 2, i.e., the development of the guidelines) will be detailed in Chapter 5.

4.3 Quantitative Approach

4.3.1 Overview of Fieldwork Activities in the Quantitative Approach

In the quantitative research approach, data were collected through a Likert scale from the 12 selected district hospitals. These Likert scale was composed of closed-ended items. Questions were divided into sections, namely:

1. **Section A:** Demographic Data
2. **Section B:** Antenatal Care (the role of midwives in ANC that can reduce occurrence of preterm birth and death)

3. **Section C:** Labour Care (the role of midwives in labour care that can reduce occurrence of preterm birth and death)
4. **Section D:** Puerperium (the role of midwives in neonatal care that can reduce occurrence of preterm birth and death)
5. **Section E:** Resources (availability of resources that can reduce occurrence of preterm birth and death)
6. **Section F:** Effective Support (effective midwife support in provision of maternal and neonatal care that can reduce occurrence of preterm birth and death):
 - ✎ Views of midwives regarding preconception care that can reduce occurrence of preterm birth and death;
 - ✎ The role of midwives in ANC that can reduce occurrence of preterm birth and death;
 - ✎ The role of midwives in labour care that can reduce occurrence of preterm birth and death;
 - ✎ The role of midwives in neonatal care that can reduce occurrence of preterm birth and death;
 - ✎ Availability of resources that can reduce occurrence of preterm birth;
 - ✎ Death and effective midwife support in provision of maternal and neonatal care that can reduce occurrence of preterm birth and death.

One research assistant was employed, the assistant distributed the Likert scale to the participants who were willing to participate and those who were not willing were not given the Likert scales. The research assistant remained with them assisting them where they needed clarity and assistant. The scales were collected immediately after completion and all distributed scales were received.

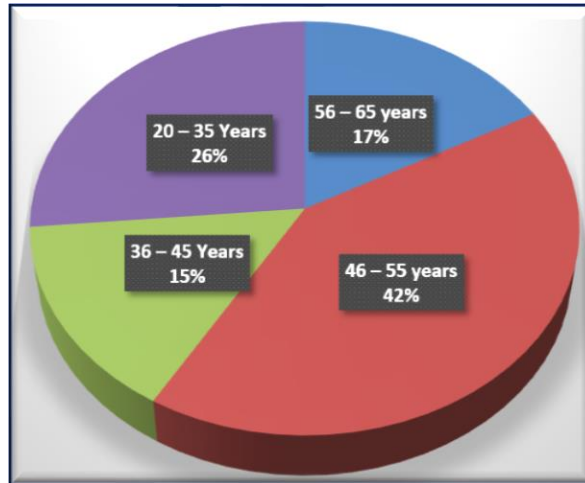
4.3.2 Presentation of Quantitative Results

The quantitative results were presented from section **A** = demographic data; section **B** = the role of midwives in ANC that can reduce occurrence of preterm births and deaths; section **C** = the role of midwives in labour care that can reduce occurrence of preterm births and deaths; section **D**= the role of midwives in neonatal care that can reduce occurrence of preterm births and deaths; section **E** = availability of resources that can reduce occurrence of preterm births and deaths; and section **F**= effective midwife support in provision of maternal and neonatal care that can reduce occurrence of preterm births and deaths.

Quantitative research data obtained from the participants were entered into the computer software, SPSS version 23.0, for analysis with the aid of the statistician. Descriptive statistics, specifically frequency distributions and percentages, were used to summarize data collected in the study. Frequency distributions were used for categorical variables and means and standard deviations for continuous variables. Tables 4.1 to 4.6 present quantitative research findings from fifty-five (55) returned questionnaires.

4.3.3 Section A: Demographic Data

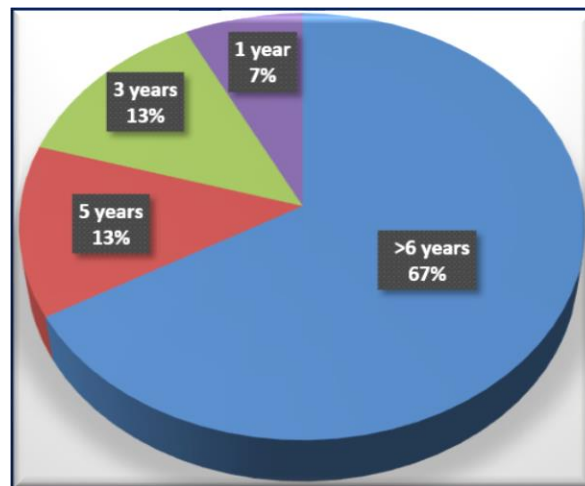
Figure 4.1 indicates that 42% of midwives were aged ranging from 46-55 years, 17% from 56-65, 26% from 20-35 and 15% between 36-45 years. The findings implied that more than 50% of midwives were 46 years and above.



n = 55

Figure 4.1: Ages of the participants

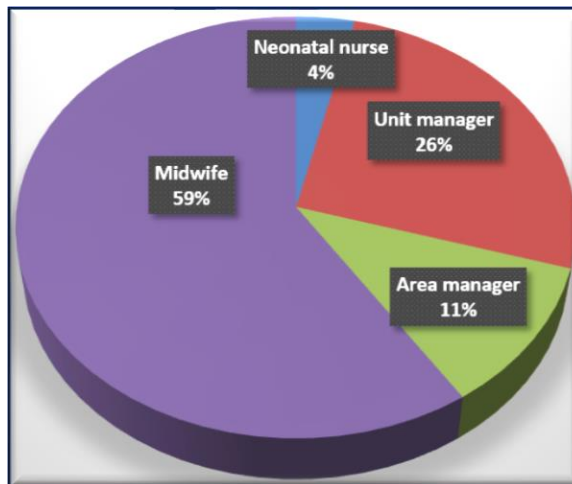
Figure 4.2 shows that 67% of midwives had more than 6 years' experience in maternal and neonatal care, 13% had 3-5 years' experience and 7% had a 1-year experience.



n = 55

Figure 4.2: Experience of midwives in maternal and neonatal care

Figure 4.3 indicates that 59% of midwives were basic midwives, 26% were unit managers, 11% were area managers and 4% were neonatal nurses.



n = 55

Figure 4.3: Position of midwives in the unit

4.3.4 Section B: Antenatal Care

Table 4.1 summarizes the roles of midwives in Antenatal Care that can reduce preterm births and deaths. Above 80% of midwives, unit and area managers agreed that their roles included to: take first antenatal visit blood specimens for investigations; make sure that all results are back and assessed for any abnormalities that need attention by other team members; screen the pregnant women for all types of infections; assess and classify pregnant women as low or high risk and to ensure that all women had five or more visits to the clinic for proper management and reduce risk of preterm birth and death.

The roles differentiation was revealed in the roles that include to: encourage pregnant women to book ANC before 12 weeks of their gestational period; keep record and notes of all outpatient pregnant women starting from the first visit until the last visit; take and record the baseline vital signs; refer all women who need attention of doctors, social workers or dietician. However only 50% of Neonatal Nurses regarded the above roles as fundamental.

Table 4.1: Roles of midwives in antenatal care that can reduce preterm births and deaths

My role as midwife in antenatal care is to:	Midwives		Unit and Area Managers		Neonatal Nurses	
	Agree	Disagree	Agree	Disagree	Agree	Disagree
Item no.	%	%	%	%	%	%
1. Encourage pregnant women to book antenatal care before 12 weeks of their gestational period.	29.1	70.9	29.1	70.9	50	50
2. Keep record and notes of all outpatient pregnant women starting from the first visit until the last visit	78.2	21.8	78.2	21.8	50	50
3. Take first antenatal visit bloods specimens for investigations	96.3	3.7	96.3	3.7	100	0
4. Take and record the baseline vital signs	98.2	1.8	98.2	1.8	00	100
5. Make sure that all results are back and assessed for any abnormalities that need attention by other team members	92.7	7.3	92.7	7.3	100	0
6. Refer all women who need attention of doctors, social workers or dietician.	90.9	9.1	90.9	9.1	50	50
7. Screen the pregnant women for all types of infections	98.1	1.9	98.1	1.9	100	0
8. Assess and classify pregnant women as low or high risk	96.2	3.8	96.2	3.8	100	0
9. Ensure that all women had five or more visits to the clinic for proper management and reduce risk of preterm birth and death.	81.1	18.9	81.1	18.9	100	0

4.3.5 Section C: Labour Care

Table 4.2 summarizes the perceived roles of midwives in Labour Care that can reduce preterm births and deaths. Above 70% of midwives, unit and area managers agreed that the midwives were able to execute their role of providing labour care that could reduce preterm birth and death whilst only 45% of neonatal nurses agreed, implying that more than 50% of the neonatal nurses were not agreeing that midwives were able to provide quality care in order to reduce preterm birth and deaths.

However item no. 3 in all categories the agree percentage was below 60%, implying that pregnant women were not receiving steroids to prepare the neonate for extrauterine life. Item no. 10 the agree percentage of midwives, unit and area managers was 34% whilst neonatal nurses disagreed, implying that there was not enough supply of neonatal nurses who were specialized in provision of neonatal care.

4.3.6 Section D: Puerperium

Table 4.3. summarizes the roles of midwives in Puerperium (Neonatal) Care that can reduce preterm births and deaths. About 90% of midwives, unit and area managers agreed that the midwives were able to maintain all measures to reduce infection in the neonatal unit; provide the preterm baby with warm feeds; ensure that all midwives in the neonatal unit are trained on the skill helping baby breathe (HBB); change position of preterm babies frequently to prevent skin breakages; prevent cold stress to all preterm babies and to teach mothers the Kangaroo care and ensure that is being practiced with all preterm babies. This implied that midwives were able to execute their role of providing puerperium care that could reduce preterm birth and death. Above 70% of neonatal nurses agreed with the statement. However the variation was seen wherein only 55% of midwives were able to: encourage breastfeeding within the first hour of life; Care for the pressure points of the preterm baby; provide and arrange counselling to the mothers of preterm babies for emotional and psychological support;

Table 4.2: Roles of midwives in labour care that can reduce preterm births and deaths

My role as midwife in antenatal care is to:	Midwives		Unit and Area Managers		Neonatal Nurses	
	Agree	Disagree	Agree	Disagree	Agree	Disagree
Item no.	%	%	%	%	%	%
1. Take full history during the admission of a woman in labour and record.	94.4	5.6	94.4	5.6	100	0
2. Ensure that all women diagnosed with preterm labour are transferred to hospital for further management.	96.2	3.8	96.2	3.8	100	0
3. Provide women with preterm labour steroids before transferring them to hospitals.	54.7	45.3	54.7	45.3	0	100
4. Assess the contributory factors of preterm labour and give proper advice and management.	85.2	14.8	85.2	14.8	0	100
5. Ensure that all women with preterm labour are cut episiotomy when assisting preterm labour to avoid injuries on the soft skull of preterm baby.	67.8	32.9	67.8	32.9	0	100
6. Prepare the labour room warmly when anticipating preterm birth.	94.4	5.6	94.4	5.6	50	50
7. Call for paediatrician when anticipating preterm birth.	67.9	32.1	67.9	32.1	0	100
8. Alert nursery in time when anticipating preterm birth.	85.2	14.8	85.2	14.8	100	0
9. Prepare the resuscitation area well in advance when anticipating preterm birth.	94.4	33.7	94.4	33.7	100	0
10. Not to provide the labour unit trained neonatal/paediatric nurse covering all shifts.	33.7	67.3	33.7	67.3	0	100

Moreover, they indicated that they were able to prevent brain injuries at all times when handling the preterm baby and to ensure that all family members were included in the care of the preterm baby. This implied that care provided to preterm neonates was not enough leading to the increased preterm death in Limpopo Province. However, Neonatal Nurses on average showed some competence as about 80% agreed to the execution of neonatal care that could reduce preterm births and deaths.

4.3.7 Section E: Effective Support

Table 4.4 shows the availability of resources that can assist midwives to provide quality care that can reduce preterm births and deaths. The response of all categories in the availability was neutral at 50% agree and 50% disagree, implying that there is less availability of resources that assist midwives in execution of their role during maternal and child care.

To give more clear picture item no. 4 was at 25%, implying that there is shortage of staff, item no. 2 at 34% implying that there was less equipment and item number 3 agree percentage was at 38% implying that there was few doctors available to assist the midwives during maternal and neonatal care and consequently ineffective neonatal care leading to the increased rate of preterm births and deaths in Limpopo Province.

4.3.8 Section F: Support

Table 4.5 shows the effective midwife support in provision of quality care to preterm babies in neonatal units to reduce preterm births and deaths. About 40% of midwives, area and unit managers did not agree that all units have enough speciality on midwifery training on the care of preterm babies; there is a programme on the in-service or periodic drills on the HBB skill and midwives receive additional training on care of preterm babies; there is a programme on the in-service or periodic drills on the HBB skill and that midwives receive additional training on the care of preterm babies.

Table 4.3: Roles of midwives in puerperium care that can reduce preterm births and deaths

My role as midwife in puerperium care is to:	Midwives		Unit and Area Managers		Neonatal Nurses	
	Agree	Disagree	Agree	Disagree	Agree	Disagree
Item no.	%	%	%	%	%	%
1. Always maintain all measures to reduce infection in the neonatal unit.	94.4	5.6	94.4	5.6	100	0
2. Ensure that all midwives in the neonatal unit are trained on the skill helping baby breath (HBB).	96.2	3.8	96.2	3.8	100	0
3. Encourage breastfeeding within the first hour of life.	54.7	45.3	54.7	45.3	50	50
4. Always provide the preterm baby with warm feeds.	85.2	14.8	85.2	14.8	0	100
5. Care for the pressure parts of the preterm baby.	67.8	32.9	67.8	32.9	50	50
6. Change position of preterm babies frequently to prevent skin breakages.	94.4	5.6	94.4	5.6	50	50
7. Provide and arrange counselling to the mothers of preterm babies for emotional and psychological support.	67.9	32.1	67.9	32.1	50	50
8. Always prevent cold stress to all preterm babies.	85.2	14.8	85.2	14.8	100	0
9. Teach mothers the Kangaroo care and ensure that is being practiced with all preterm babies.	94.4	33.7	94.4	33.7	100	00
10. Prevent brain injuries at all times when handling the preterm baby.	33.7	67.3	33.7	67.3	100	00
11. Ensure that all family members are included in the care of the preterm baby.	67.2	32.8	67.2	32.8	100	50

Table 4.4: Availability of resources that can assist midwives to provide quality care that can reduce preterm births and deaths

The support role of unit managers in the obstetric units is to:	Midwives		Unit and Area Managers		Neonatal Nurses	
	Agree	Disagree	Agree	Disagree	Agree	Disagree
Item no.	%	%	%	%	%	%
1. Ensure that all units (antenatal, labour, postnatal and neonatal) have well explained midwifery-centred policy supporting the preterm care.	86.2	13.8	86.2	13.8	100	0
2. Always provide midwives with all equipment needed to provide quality care.	34	66	34	66	50	50
3. Make sure all units have doctors/nurse specialists designated for neonatal unit for 24 hours.	38.2	61.8	38.2	61.8	0	100
4. All units have adequate staff for 24 hours.	25.4	74.6	25.4	74.6	50	50
5. Provide special room for preterm babies.	76.4	23.6	76.4	23.6	100	0

On average only 36% midwives, area and unit managers agreed that the obstetric units in Limpopo Province have a mentor or advanced neonatal nurse available for 24 hours; midwives receive counselling after experiencing a difficult situation in the unit and that midwives have time to conduct research and use evidenced-based care. The differentiation implied that midwives were less equipped and did not use evidence-based care to promote quality life of preterm babies.

Neonatal nurses also showed disparity of skills and utilization of the evidence bases care in Limpopo, only 33% agreed with item no. 1, 2 and 4 whilst 25% on neonatal nurses agreed with item no. 3, 5 and 6. The general picture revealed that there was ineffective midwife support in provision of quality care to preterm babies in neonatal units to reduce preterm births and deaths.

Table 4.5: Effective midwife support in provision of quality care to preterm babies in neonatal units to reduce preterm birth and deaths

Effective midwife support must ensure that	Midwives		Unit and area Managers		Neonatal Nurse	
	Agree	Disagree	Agree	Disagree	Agree	Disagree
Items	%	%	%	%	%	%
1. All units have enough speciality on midwifery training on the care of preterm babies.	50.9	49.1	50.9	49.1	50	50
2. There is a programme on the in-service or periodic drills on the HBB skill.	74.6	25.4	74.6	25.4	50	50
3. The obstetric units in Limpopo Province have a mentor or advanced neonatal nurse available for 24 hours.	40.8	59.2	40.8	59.2	50	50
4. Midwives receive additional training on the care of preterm babies.	61.3	38.2	61.3	38.2	0	100
5. Midwives receive counselling after experiencing a difficult situation in the unit.	18.1	81.9	18.1	81.9	0	100
6. Midwives have time to conduct research and use evidenced-based care.	18.2	81.8	18.2	81.8	0	100

4.4 Qualitative Approach

4.4.1 Overview of Fieldwork Activities in the Qualitative Approach

In the qualitative research approach, in-depth one-to-one interviews were conducted to explore and describe the role of midwives. The objectives were to: determine the role of midwives in the provision of quality care of preterm babies within limited resources in the obstetric units of Limpopo Province, South Africa; identify the challenges faced by midwives in the provision of quality care of preterm babies in the obstetric units of the Limpopo Province and assess the support provided by the manager in the provision of quality care of preterm babies in the obstetric units of

Limpopo Province. Five (5) questions below were used to seek answers from 15 midwives and managers through in-depth one-to-one interviews. The interview sessions were conducted in English as it was also their medium of instruction in their work situation, therefore, there was no need to translate the questions. In order to promote quality in the process of obtaining data from the respondents.

The in-depth one-to-one interviews were conducted in the 12 selected districts hospitals, namely: Donald Fraser, Siloam, Malamulele and Elim hospitals in Vhembe District; Dilokong, St Rita's, Groblersdal and Matlala hospitals in Sekhukhune district and FW Knobel, Botlokwa, Helena Franz and Seshego Hospitals in Capricorn district. The data were collected from December 2016 to May 2017. Tesch's eight steps of open-coding were used to analyze qualitative data.

The following questions directed the study:

1. Can you explain what you are doing as midwives (antenatal, labour and puerperium) to reduce preterm births and save the lives of preterm babies?
2. Can you outline the resources available in the unit that assist you to save the lives of preterm babies?
3. Can you share the challenges you are facing that affect your role of saving the lives of preterm babies?
4. Can you explain the available policies/guidelines that are guiding you in the neonatal unit and enhance quality of life of preterm babies?
5. Can you suggest any form of support that can assist midwives to save the lives of preterm babies?

4.4.3 Presentation of Qualitative Results

Table 4.6 summarizes biographic data of interviewed midwives and managers (n = 15).

Table 4.6: Biographic data of interviewed midwives and managers

District	Number	Speciality	Basic Midwives	Managers
Capricorn	5	1	2	2
Sekhukhune	4	2	0	2
Vhembe	6	2	4	0
Total	15	5	6	4
Age in years		20-35 = 0		
		36-45 = 2		
		46-55 = 5		
		56-65 = 8		
Years of experience		1 year = 0		
		3 years = 2		
		5 years = 5		
		>6 years = 8		

The main theme was that there was inadequate and substandard maternal and neonatal care in most obstetric units of Limpopo Province leading to increased occurrences of preterm births and deaths. Three themes emerged from the main theme, that is, the role of midwives in reduction of preterm birth and deaths in the obstetric units; challenges faced by midwives whilst executing their role during preconception, antenatal, labour and puerperium period and support needed by midwives during provision of maternal and neonatal care that would reduce preterm births and deaths.

Midwives play a pivotal role in reducing preterm labour and birth to improve pregnancy outcomes and their infants, and early detection of preterm labour is currently the best strategy to improve the outcomes (Ricci, 2013). A midwife is the expert in normal

pregnancy and is the first point of contact for women accessing maternity services. For almost all pregnant women, the midwife is the first channel for care throughout pregnancy, labour and the postnatal period. Therefore, a midwife in an obstetric unit furnished with enough staff, equipment and material supply can provide proficient care and reduce the occurrence of preterm births and deaths, hence the quality care of preterm neonates in the units (Swann & Davies, 2012).

On the other hand, a study in England indicated that increased workforce in maternal care had a positive influence in the care of pregnant women and outcomes of preterm labour and births. The study also revealed that one-to-one maternal care to women may yield good results and can play a vital role to lift the standard of care of pregnant women and their babies, hence, reduces maternal and perinatal mortality as well as occurrences of preterm birth and deaths (Ball & Washbrook, 2010). Table 4.7 presents the themes and sub-themes which emerged.

4.5 Discussion of Findings

The data were analyzed side-by-side (parallel) as the researcher used the parallel convergent method and thus triangulation. This discussion integrated the findings from quantitative and qualitative data. The themes from the qualitative data were confirmed by the findings from the statistical data, thus merging both quantitative and qualitative data.

The combination contributed to seeing the problem from several angles and multiple perspectives, merging the results from quantitative and qualitative database had provided a discerning insight and created more holistic view of the problem under study. It also provided both numbers and stories from the participants. The parallel convergent method also served as the best method that enhanced development of clinical guidelines (Creswell & Creswell, 2017).

Table 4.7: Themes and sub-themes reflecting the roles, challenges, and the support of midwives in reducing preterm birth and deaths

Themes	Sub-Themes
1. The role of midwives in reduction of preterm births and deaths in obstetric units	1.1 Description of steps taken during the assessment of women during pregnancy, in labour and postnatal period 1.2 Explanation related to use of the existing guidelines for the management of women at risk preterm delivery 1.3 Existing multidisciplinary team effort geared towards proper management and provision of quality care to preterm babies 1.4 Description of health education content provided to women during ANC, in labour and postnatal period 1.5 Existence of referral system used which is guided by women and/or preterm infants' conditions
2. Challenges faced by midwives whilst executing their role during preconception, antenatal, labour and puerperium period	2.1 Shortage of health care professionals in the obstetric units of Limpopo Province 2.2 Lack of resources in the obstetric units of Limpopo Province 2.3 Lack of effective communication in the obstetric units of Limpopo Province 2.4 Cultural beliefs and practices of the pregnant women in rural areas of Limpopo Province
3. Support needed by midwives during provision of maternal and neonatal care to reduce preterm births and deaths	3.1 Management should supply the obstetric unit within Limpopo Province with staff, equipment, supplies and a conducive working environment 3.2 Management should ensure continuous professional development amongst health care professionals to maintain proficiency among midwives 3.3 Management should establish and maintain emotional and psychological support to health care professionals in the obstetric unit

4.5.1 Theme 1: The Role of Midwives in Reduction of Preterm Births and Deaths in the Obstetric Units

The participants described that they screened pregnant women according to their need of care following their Scope of Practice R. 2598, which direct them to diagnose the health needs of pregnant women, prevention of diseases related to pregnancy, labour and puerperium. Midwives could assess and diagnose abnormalities and provide women with advice and management of such abnormalities. Midwives encouraged women to book as soon as they missed their period or within 12 weeks and attend their antenatal follow-up as scheduled and educated women on risk factors. If a woman reported preterm labour, midwives provided them with Nifedipine tocolytic per protocol to suppress the contractions and maintain pregnancy to term, during the protocol, the woman was nursed on bedrest to provide rest.

In South Africa, midwives' role included patient education on STIs like HIV, because STIs and HIV cause placental tissue degeneration and infarcts that triggers the labour pain and in this case before 37 weeks leading to preterm labour and birth (Farrell, 2007). They also monitored foetal well-being during ANC through non-stress test which detect foetal heart rate tone, and if the tone is abnormal refer them to level 2 hospitals for the medical practitioners of advanced midwives to provide specialized care that would prevent abnormalities, including preterm birth and death. They make available resuscitation equipment to assist in the resuscitation of the newborn baby, especially preterm neonates because they are at risk of asphyxia due to immature lungs and an inadequate amount of surfactant (Farrell, 2007).

Preterm neonates are at risk of hypothermia due to lack of the shivering mechanism to generate body heat, they lack brown fat that acts as an insulator to prevent heat loss, thinner and more permeable skin, decreased ability of vasoconstriction in superficial blood vessels that make them unable to conserve heat in their core leading to preterm death (Davidson *et al.*, 2012). Therefore, midwives provided preterm

neonates with a prewarmed environment and nurse the preterm in incubators or radiant warmers and swaddle them with warm blankets to prevent death from hypothermia (Farrell, 2007). The findings indicated that majority of the midwives in Limpopo Province could execute their midwifery role of providing care to pregnant women and preterm babies.

Bed rest relieves pressure from the pelvic region, a growing baby can exert pressure on the cervix to open before term. Opening of the cervix stimulates the release of oxytocin and commencement of labour pains and this time it would be preterm birth (DOH, 2016). Infection of preterm neonates resulted in deaths due to immature immunity as they fail to fight infection acquired from the uterus in case infection was the cause of preterm birth, fragile skin easily excoriated, and many invasive procedures as they are at risk and the immunoglobulins do not cross the placenta and they can get immunoglobulins in breast milk.

Midwives, therefore, could prevent infection in the neonatal unit by encouraging mothers to wash hands before handling the baby. Midwives practiced handwashing between the neonates (Davidson *et al.*, 2012). The statistical results confirmed the theme as the majority of the participants agreed with the statements describing the precautions and care provided by midwives on average 70% agreed that midwives can execute the antenatal, 80% agreed in execution of labour and puerperium (neonatal) care, however, shortage of staff, lack of material supply and dilapidated old infrastructures hampered the provision of quality care leading to increases in preterm births and deaths in Limpopo Province. Figure 4.4 depicts the sub-themes that emerged from theme 1.

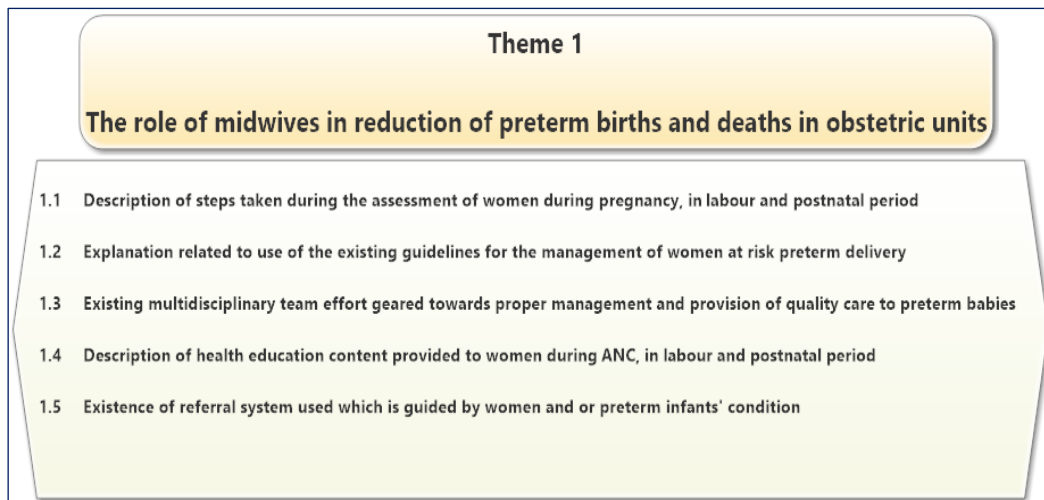


Figure 4.4: Sub-themes from theme 1

4.5.1.1 Sub-Theme 1.1: Description of the Steps Taken During the Assessment of Women During Pregnancy, in Labour and Postnatal Period

The participants described the steps taken during the care of pregnant women which included encouraging them to book antenatal clinic as soon as they missed their period before 12 weeks of gestation. This was done so that women are provided with health education on a healthy nutritional diet that enhances foetal growth and reduce risk of preterm birth and death. They also educate them on infectious conditions and other medical conditions that predisposed them to preterm birth. Infectious conditions taught included HIV that predisposes women to preterm labour and birth.

Participants' direct quotations or excerpts:

❖ **Midwife 5 from Vhembe district:**

Mmm, okay as a midwife I do this by encouraging early booking by the mothers so that I can identify any complications and I can treat immediately for example STIs, that can cause preterm labour, now other complications will include HIV because other people can get preterm labour because of HIV-positive status. So, you need to identify all those complications, so immediately when you see that these patients have this condition you need to give the steroids to prepare in case the woman fell into preterm labour.

Table 4.1 shows that 98.1% of midwives and managers agreed that midwives assessed all women for the medical conditions that complicate pregnancies, for example, cardiovascular disorders and hypertensive disorders. About 96.2% agreed on screening for diabetes mellitus, antepartum haemorrhage due to placenta praevia and abruption as well as infectious conditions like malaria and HIV. The medical conditions that lead to preterm labour and birth include hypertensive disorders. Hypertension in pregnancy develops because of vasoconstriction. Vasoconstriction reduces oxygen and nutrition supply to the placenta resulting in placental insufficiency and consequently death due to placental cell infarcts. The infarcts on the placenta stimulate the release of oxytocin and if this is before 37th week's gestation, leading to preterm labour and birth (Davidson *et al.*, 2012). The women were assessed if they were eating non-nutritious substances like soil. The craving of non-edible substance is a sign of low iron stores or anaemia. Low iron stores cause high level of haematocrit and reduce nutrient supply to the placenta leading to degenerative disorders of placenta (infarcts), hence causing preterm labour and birth. The statistical analysis confirmed this theme as more than 80% of the participants agreed that midwives could execute their role of antenatal, puerperal and neonatal care whilst above 70% agreed with execution of labour care.

Participants direct quotations or excerpts:

❖ Midwife 4 from Vhembe district:

I make sure that the mother is early booked, before 12 weeks and then the antenatal (ANC) investigations are done, health education is also done explain to the mother about healthy food, how to cook and what to eat and so on, and to avoid eating soil. Teach the mother to know if she is having high blood pressure, that is she is taught signs and symptoms of and to attend ANC regularly until delivery.

The Department of Health, in support of the participants' responses, had a recommendation that direct midwives to teach all women to book early as soon as

they miss their period for early identification of risk factors as well as risk of preterm labour and birth (DOH, 2014). The midwives followed the recommendations as they advised women on a healthy diet during pregnancy and breastfeeding; they advised women not to skip a meal. Women need to eat a diet that includes starch, vegetables, fish, meat and poultry, drink a lot of clean water and other fluid to strengthen their bodies and avoid preterm labour and birth (DOH, 2014). The midwives also provided the women with a booklet called *Mother, Child Health and Nutrition* that guides women on the proper diet selection, cooking and storage for reuse (DOH, 2014).

Participants direct quotations or excerpts:

❖ Midwife 2 from Vhembe district:

I teach the mother again to book ANC early and to differentiate the true labour “uri” so that they identify if true or false labour again the mother is supposed to know the causes of that, the preterm labour and encourage the mother to report if there is any problem and if she sees any problem should visit the nearest clinic or hospital.

In support of the quotation the statistical results in Table 4.2 show that 85.2% of participants agreed that midwives assess for the cause of preterm labour, 96.2% agreed that midwives transferred all women with preterm labour to hospital and 54.7% agreed that midwives provided women with preterm labour with steroids before transferring them to hospital.

In support of the participant, the Rosenfield treatment care plan was clear and easy to understand and aimed at prevention of preterm labour and birth. Midwives made pregnant women aware of their prescribed medications, doses, and required time between medications and informed pregnant women who the responsible provider of care is during each shift and who to contact if they have a concern about the safety or quality of care (Rosenfield *et al.*, 2007).

They created opportunities for pregnant women and family members to address any medical care questions or concerns with their health care providers to provide a smooth platform for excellent care. They informed pregnant women and family members of the next steps in their care, so they can if necessary communicate this to the care provider on the next shift, or so that they are prepared to be transferred from one setting to the next, or to their homes. The total care was aimed at reducing preterm labour and birth in the obstetric unit (Rosenfield *et al.*, 2007).

Participants direct quotations or excerpts:

❖ Midwife 1 from Vhembe district:

My part in the ward is when we get patients from home, whereby we try by all means to identify the problem from all patients who are coming through screening them.

In support of the quotation, statistical results in Table 4.2 show that 94.4% of the participants agreed that midwives took full history and recorded all deviations from normal during admission of the woman in the unit. Midwives in South Africa, as directed by the SANC Regulation (R. 2598), taught women on behaviour and lifestyle modification such as drinking a lot of water to prevent urinary tract infections (UTIs). Urinary tract infection is an inflammatory condition that can cause premature rupture of membranes (PROM) and prolonged rupture of membranes may lead to the induction of labour, hence preterm labour and birth.

Thus, midwives advised women to do light jobs to reduce risk of preterm labour and birth. Women were advised not to expose themselves to people with infections like common colds and influenza to reduce cross-infection, the infections predispose the pregnant women to PROM and consequently preterm labour and birth (Davidson *et al.*, 2012).

Participants direct quotations or excerpts:

❖ Midwife 3 from Vhembe district:

I can say I tell the woman to do light jobs, again explain the food that she is supposed to eat, healthy food. She must see to it that she is always away from infectious diseases, and then again if she sees that she has the venereal diseases she must come to hospital to get some treatment so that we save the child also. If she does not get the treatment she will have the problem of preterm labour. Again, she need to drink a lot of water to prevent the infections like UTIs and again she need to drink this iron preparations because if she ignores this you may find that she is going to have a problem, you may find that most of the preterm occurs due to anaemia, and again the preterm baby will be born with immature liver, when she took this iron she will have less problem, the more the blood in the mother the less the risk of preterm labour. She must again avoid heavy duty.

In support of the above statistical results in Table 4.1 show that 85.2% of participants agreed that women were taught the danger of eating non-edible things like soils whilst 14.8% disagreed with the statement.

Literature revealed that women in low- and middle-income countries suffer from iron deficiency anaemia due to low micronutrient food intake. Besides poor dietary intake by women from this region, they also suffer from conditions like diarrhoea and worm infestations that reduce absorption of the iron by the body. Therefore, women from this region were given iron supplements to boost their iron intake and iron stores to prevent adverse effects, including premature labour and birth (Darnton-Hill & Mkparu, 2015).

The participants were also able to describe the steps taken during the assessment of pregnant women which included taking blood for rapid plasma test (RPR) for detection of syphilis, and management of infectious conditions like STIs and HIV. HIV infection causes viral infection of the placenta and bacterial sensitization and inflammatory processes which predispose the pregnant women to PROM, hence preterm labour

and birth (Davidson *et al.*, 2012). In case they diagnose that the patient was experiencing preterm labour, they were providing women with steroids to facilitate lung maturity (Dexamethasone 12 mg, intramuscularly); the drug enhances the production of surfactant and hastens lung maturity and prepared the neonate to initiate the first breathing thereby preventing asphyxia which is among the top 5 conditions causing morbidity and mortality in preterm neonates.

Women reporting preterm labour were given tocolytics, for example, Nifedipine to prevent contractions. Nifedipine 30 mg loading dose and 20 mg three hours later delays labour for 3 days to allow foetal lung maturity (DOH, 2015). Nifedipine is a calcium channel blocker and oxytocin antagonist, that is, it inhibits the release of oxytocin which is the hormone responsible for initiating uterine contractions. In case midwives had failed to stop preterm labour, they report the patient to an advanced midwife or a doctor who was at the same time referring to the multidisciplinary team members for the expertise assistance (DOH, 2015).

Participants direct quotations or excerpts:

❖ Midwife 6 from Sekhukhune district:

Mmm, okay as a midwife is my role to save the lives of preterm babies, I do this by encouraging early booking by the mothers so that we can identify any complications and we can treat immediately for example STIs by giving ceftriaxone 250 mg intramuscularly, metronidazole 2 grams stat and amoxicillin 250 mg three times daily for 7 days), that can cause preterm labour, now other complications will include HIV because other people can get preterm labour because of HIV-positive status. So you need to identify all those complications, so immediately when you see that these patients have this conditions you need to give the Steroids (dexamethasone 12 mg stat dose and then another dose after 24 hours), if labour starts you need to do tocolysis, if the patient is in the clinic they need to give steroids, tocolysis, and refer for high risk clinic or to maternity because sometimes you may find that the labour is advanced but anyway if, if is having repeated preterm, you need to link that mother with the doctor and discuss this so that the future pregnancy is timed/planned.

In support of what the participant said, Table 4.2 shows that 54.7% agreed that midwives provide women with steroids before transferring them to hospitals whilst 45.3% disagreed with the statement. About 85.2% agreed that midwives assess the cause of preterm labour and give proper management whilst 14.85% disagreed with the statement. Midwives as directed by the SANC regulation relating to the conditions under which registered midwives may carry on their profession (R. 2488) are supposed to assess pregnant women and diagnose the deviation from normal and provide appropriate midwifery care. They had to advise the woman to at least visit the medical practitioner and undergo medical assessment once during her pregnancy and she is supposed to attend the woman every month until she is 28 weeks, fortnightly until 36 weeks and weekly until confinement of labour to make sure that there are no adverse complications, including preterm labour and birth (SANC, 1990). However, the follow-up visits, according to BANC are at 20, 26, 32 and 38 weeks gestation. At the follow-up visits, after the questioning and examination, the antenatal card is completed and the follow-up visit checklist filled in and kept at the clinic for reference (DOH, 2005). A revision of the BANC included a reasonable compromise would be to continue to implement the WHO BANC model with reduced, goal-orientated visits up to 32 weeks' gestation, and thereafter to revert to routine visits every 2 weeks to 36 or 38 weeks, followed by weekly checks model of BANC plus (DOH, 2015).

To reduce the risk of preterm births and deaths, the guidelines for maternity care in South Africa (DOH, 2016) support the above by outlining the treatment of common STIs. Vaginal candidiasis is treated with Ceftriaxone 250 mg IMI stat, Metronidazole 2 g stat, Amoxicillin or Erythromycin 1 g stat and to avoid prolonged course of Amoxicillin (DOH, 2016). Syphilis and RPR positive test is treated with Benzathine Penicillin 2.4 million units IMI once weekly for 3 doses (DOH, 2016).

Participants also indicated that they had time to give each other report and peer education on the existing medical conditions that predisposed pregnant women to

preterm births and deaths. The delivered preterm baby was given the surfactant replacement, surfactant corrected the respiratory distress by lessening the chance of the neonate to develop hyaline membrane syndrome which is common in the very-low-birth-weight preterm babies. The therapy enhanced initiation and maintenance of normal respiration to prevent asphyxia which could lead to preterm death (DOH, 2016). They further indicated that in case they were faced with very low birth weight preterm baby they referred the preterm baby to level three hospital which was Mankweng Hospital; they also referred this preterm when there was no surfactant replacement at the district hospitals.

Participants direct quotations or excerpts:

❖ Midwife 1 from Vhembe district:

Another thing that we are doing when we are engaging with the women, when we are attending the women we try by all means to communicate amongst ourselves even giving each other report about the women so that we identify and show each other those who are high risk so that we have the caution from the beginning, conditions such as “vho” hypertension, we try to stress on them, and then in-between ourselves staff we have what we call lectures amongst ourselves about his conditions so that we can be able to identify the risks before they become a problem.

In support of what the participant said, the WHO encourages health care providers, including midwives, to hand over report between staff change of shift and between different patient care units during a patient transfer. They also encouraged handing over of report to patient and relatives that to engage the patient in their care (Rosenfield *et al.*, 2007).

Participants direct quotations or excerpts:

❖ Midwife 2 from Vhembe district said:

Okay, if the mother is not term I will ask her if she had given a correct date

and she is sure about her dates and then if she is in labour. I think I am supposed to report to the doctor and then after that if, no because I am a midwife I am supposed to know the estimated weight of the baby, just because like in our hospital if the baby is too small it means that this baby is supposed to go to “vho” Polokwane or “vho” to Mankweng hospital to save the life of the baby just because here we don’t have more equipment for the neonates like this one. If she delivered a baby like I said it will be transferred to neonatal ward for assessment and further management. If too small be transferred to Polokwane/Mankweng Hospital. And, another thing, the baby is supposed to be seen by the doctor and ordered a treatment if there is a need to of treatment”.

In support of the participant the SANC regulation, R. 2488 subsection (10) allows the midwife to call for medical assistance in case the neonate is a preterm or malformed or is under any undue condition that warrants the assistance of a medical practitioner (SANC, 1990). The Scope of Practice of a Registered Nurse Regulation R. 2598 also supports the midwives by directing them to provide effective advocacy for neonate and coordinate the health care regimen that enable the neonates to be seen by other categories of health including medical practitioners, dieticians and psychologists (SANC, 1984).

A study on reducing preterm birth, recommendations for the South-East Region, screening for preterm by midwives by history taking and assessment of women during antenatal period was the best tool to identify the women at risk and this intervention brought a vast improvement in the prevention of preterm birth and death in that region (Roberts, Mansell, Ansboro, Frodsham & Jolly, 2015). A study in Sweden indicated that most midwives were able and willing to assist women and could create a meaningful support to women through proper use of guidelines to assess and manage the pregnant women. Midwives could build and maintain mutual relationship which strengthened the woman’s self-esteem and give the woman security (Lundgren & Berg, 2007).

A study in the USA showed that women who had a midwife screening their prenatal and care provider reported fewer problems than women who had care from other types of clinicians, suggesting that this model of care results in better patient-clinician communication. The study supports that good communication yields good results (Kozhimannil *et al.*, 2015). Another study in the USA indicated that surfactant therapy combined with maternal steroids had a good effect in the prevention and management of a respiratory distressed preterm neonate. The therapy was also useful in prevention of multifactorial organ failure (Dargaville *et al.*, 2011).

4.5.1.2 Sub-Theme 1.2: Explanation Related to Use of Guidelines for the Management of Women at Risk of Preterm Delivery

Findings revealed that midwives referred to the available guidelines when managing women with preterm labour. Midwives always referred to the maternal guidelines, for example, *Guideline for Maternity Care in South Africa*, *National Consolidated Guidelines for the Prevention of Mother-to-Child Transmission of HIV (PMTCT)* and the *Management of HIV in Children, Adolescents and Adults* and *Saving Mothers 2011-2013: Sixth Report on the Confidential Enquiries into Maternal Deaths in South Africa*) which direct them how to manage pregnant women with complications.

On attending to woman with premature labour, they admitted her and managed her according to the gestational age, if she is above 24 weeks gestation and was at the clinic or level 1 hospital, they gave her Dexamethasone 12 mg to stimulate release of surfactant and accelerate lung maturity, Nifedipine 30 mg single dose to suppress contraction during the transfer to level 2 hospitals, on arrival at the hospital they assessed cervical dilatation and if it was 2 cm and length was 1 cm they allowed labour to progress and delivered the baby in a slow and gentle way with episiotomy to avoid pressure on a fragile immature skull (DOH, 2015). If the woman was 34 weeks and the cause of preterm labour was infection (chorioamnionitis), they allowed labour to progress and treat the delivery as for the term baby.

If the Nifedipine regimen worked and suppressed the contractions the woman was discharged after 48 hours; before discharge the midwives repeated the cervical assessment to make sure was closed, midwives then would make good notes in the woman's maternity case records, changed her status from low risk to high risk and follow up the woman in a week at the high-risk clinic until confinement of labour (DOH, 2015). In case the baby was delivered midwives would assess the viability of the neonate and admitted the neonate in the high risk neonatal unit and provide proper management that would save the life of the preterm baby. Management include active resuscitation (helping baby breath), putting the baby inside the incubator until stable and start with the KMC to promote warmth and reduce risk of hypothermia or cold stress (DOH, 2015).

Participants direct quotations or excerpts:

❖ Midwife 3 from Vhembe district:

When a woman report labour we do bedrest and avoid doing PVs and again giving health education. In case we fail to prevent labour and she delivers a preterm baby, the baby will be nursed in nursery; we give the baby a drip and encourage the mother to breastfeed, after 3 days we take the blood for Polymerase Chain Reaction (PCR), Urea and Electrolyte (U&E) to check infections and other things. And again, encourage the baby to breastfeed according to the required calories and then the mother also does KMC and then we discharge the baby at 1.8 kg and encourage her to continue breastfeeding and to go to the clinic at 6 weeks. Encourage breastfeeding exclusively for 6 months and then introduce solids, then continue breastfeeding for two years. Then at home she must continue to do KMC until the baby is 2.5 kg. Oh...I forgot all the babies including HIV they are discharged at 1.8 kg and come to hospital weekly for control of weight, at the time of visit you ask the mother if the baby is growing and feeding well. And for these women who are "ehh" HIV-positive from labour ward we took PCR from the baby and then the mother will get the results after a week.

Table 4.4 indicates that 86.2% agreed that all units have well explained midwifery-centred policy supporting their care whilst 13.8% disagreed with the statement. This

implied that some guidelines were available for midwives to refer during the execution of their role. In support of what the participant said, Davidson, London & Ladewig (2012) directed midwives to nurse women with preterm labour on bedrest, and to minimize the number of vaginal examination to reduce risk of introducing infection and irritation of the cervix. Cervical irritation may stimulate the release of oxytocin and stimulate labour contraction and in case the pregnancy is before 37 weeks this will be preterm labour. Midwives need to maximize uterine perfusion through provision of enough fluid and monitoring of the intake and output.

Maternal laboratory studies include Complete Blood Count, C-Reactive Protein, vaginal culture and urine culture. Amniotic fluid cultures are sometimes done to rule out intra-amniotic infection as a cause of preterm labour (Davidson *et al.*, 2012). The challenge faced was that there is only one maternity guideline for all maternal conditions. The midwives indicated that there was a need to have midwifery practice developed by midwives describing the care and management related to preterm labour and birth.

The findings were confirmed by results wherein the statements describing availability of midwifery-related guidelines was agreed to by a large proportion of participants, i.e., 87%. However, this is not enough as policy guidelines coverage need to be at least at 99%, meaning that all midwifery-related guidelines need to be available for quality for the midwives to provide care. The concluding remarks indicated that the areas where the managers were more positive that midwives need attention.

Participants direct quotations or excerpts:

❖ Midwife 5 from Vhembe district:

Mmm, okay as a midwife is my role to save the lives of preterm babies, so you need to identify all those complications, so immediately when you see that these patients have this conditions you need to give the steroids, if labour Another thing "eeh", if may be the mother has an incompetent

cervix/cervical incompetency they should do the Shirodgar stitch to can prevent preterm labour., and then another thing is the antibiotic in case of infections they should give the antibiotics according to the guidelines , even blood tests can be taken and to identify the infections.

In support of what the participant said, Shirodgar stitch also known as cervical cerclage was used as a treatment of cervical incompetence when the woman had experiences early shortening and opening of cervix before term pregnancy resulting in discourages or preterm labour and birth. This was avoided by application of a strong suture around the cervical opening. The treatment was found effective in all women who had repeated miscarriages or preterm birth when administered in week 12 or 14 and removed at term, that is, from 37 weeks onwards (Alfirevic *et al.*, 2011).

Participants direct quotations or excerpts:

❖ **Manager from Capricorn district:**

The one that we are using is the maternal guidelines, this one we refer to it on daily basis, to manage the patients. We also have “mmm” what, prevention of mother-to-child infection (PMTCT) guidelines in Saving Mothers’ Guidelines. Neonatal guidelines I am not sure of may be those working in neonatal unit.

Table 4.4 indicates that 86.2% of participants agreed that all units have well-explained midwifery-centred policy supporting care whilst 13.8% disagreed with the statement. This implied that some guidelines were available for midwives to refer during the execution of their role. In support of what the participant said, a study on practice pattern in the management of threatened preterm labour in Korea, indicated that lack of standardized preterm management guidelines led to various practices amongst midwives and had affected the outcome adversely (Hwang *et al.*, 2015).

Participants direct quotations or excerpts:

❖ Midwife 1 from Vhembe district:

Ooh yes even when I consider the topic I think you are on the right track if they can provide us with the guidelines that that help us to help without the involvement of a doctor because when you look at the staff most is the inclusion of the multidisciplinary which limit the midwife.

Table 4.2 shows that 67.9% of participants agreed that midwives call for paediatricians when anticipating preterm birth whilst 32.1% disagreed, 85.2% agreed that midwives alert nursery in time when anticipating preterm birth, whilst 14.8% disagreed with the statement.

Studies revealed that other countries had improvement on the outcomes of preterm babies, countries like Germany had specific guidelines related to the prevention, diagnosis and treatment of premature labour (Schleußner, 2013). The guidelines strictly specified the preventive measures which included cervix length measurement by transvaginal ultrasonography, cerclage and complete closure of the birth canal, progesterone supplementation and inhibition of uterine contractions with tocolytic drugs (Schleußner, 2013). The diagnostic measures included history of previous preterm birth, assessing secondary factors like infections and medical conditions such as hypertensive disorders, hypoxic conditions of placenta and foetal malformations like hydrocephalus. The treatment included bed rest, antibiotic therapy and drugs to induce lung maturity (Schleußner, 2013).

4.5.1.3 Sub-Theme 1.3: Existing Multidisciplinary Team Effort Geared Towards Proper Management and Provision of Quality Care to Preterm Babies

Participants indicated that in cases where a woman reporting preterm labour, they could prioritize the patient according to their need of care and were able to involve the multidisciplinary team in the care of high risk women to prevent complications.

Participants direct quotations or excerpts:

❖ Midwife 1 from Vhembe district:

We try to involve the multidisciplinary team in assessing the patient and helping them. The other thing is mostly advising especially when we are admitting the woman we pass them information about the things following pregnancy that they must have to visit the clinic where they will be taught how to manage their pregnancy.

In support of what the participants said, the *Maternal Guidelines of South Africa* direct midwives to transfer or hand over the patient at risk to other team members meaning medical practitioners or transferring the patient from a level 1 hospital to a level 2 hospital, from the midwife to an advanced midwife for specialized and quality care (DOH, 2016). The multidisciplinary team members included doctors to whom midwives report the patients with infections so that the doctor prescribe the antibiotic therapy to combat the infection before it could cause preterm labour. The midwife reported the preterm baby to a Neonatal Nurse in the Neonatal Unit who prepared a warm environment to receive the preterm baby and prevent cold stress which can lead to death of the neonate.

The neonatal nurse reported the preterm baby to the paediatrician who will prescribe the correct and appropriate treatment therapy for the neonate. The neonates will then be discharged via an occupational therapist who will assist the mother with fine motor activity to promote muscle activity as the preterm babies are born with immaturity and their neurological system is underdeveloped. The preterm baby needs follow-up by the occupational therapists to continue demonstrating passive and active exercise to further develop the neurological system of the preterm at home (Barbosa, 2013).

Participants direct quotations or excerpts:

❖ Midwife 8 from Sekhukhune district:

One other thing is to include Occupational therapists on the care of the

preterm babies because some babies may have muscle problems and need OT to assist. I think doctors need to transfer them when they are about to discharge them so that they continue with the care.

Table 4.2 shows that 67.9% of participants agreed that midwives call for paediatricians when anticipating preterm birth whilst 32.1% disagreed, and 85.2% agreed that midwives alert nursery in time when anticipating preterm birth whilst 14.8% disagreed with the statement. These results implied that midwives were referring women with preterm labour and the preterm neonates to other health care team members. In support of what the participants said, a study in Israel revealed that inclusion of the occupational therapists in the team providing care to neonatal intensive care was beneficial to neonates. The occupational therapists were involved in the unit with teaching of the mothers on passive exercises like fisting or grasping, suckling and morrow reflexes. The involvement continues even after discharge wherein they followed up the neonates and their mother at home supervising and demonstrating the skills to the mothers. The practice demonstrates better neurological developmental results over the long and short term (Barbosa, 2013). The challenge arises sometimes when they wanted to refer the preterm neonate to doctors, there are few doctors to manage the preterm babies and they end up complicating.

Participants direct quotations or excerpts:

❖ This was confirmed by Midwife 1 from Vhembe district:

Where we are working now is difficult, a district hospital has few doctors, right now we don't have the doctor solely for maternity, the available doctor run round all units, and in case you want doctor's assistance the doctor is busy with medical cases.

Table 4.5 shows that of the participants who supported the statement, only 38.2% agreed that all units have doctor/nurse specialists designated for neonatal unit for 24 hours whilst 61.8% disagreed with the statement, suggesting that there were not a

sufficient number of doctors to cover the need of the Obstetric Units in Limpopo Province.

In addition to support of what the participant said, the *South African Health Review 2014* revealed that only one province, the Western Cape, was found with at least good staff coverage (doctors and nurses). The rest of the other provinces lacked staff (doctors and nurses), the shortage led to failure of planning for the ward-based health teams (DOH, 2013/14)

Participants direct quotations or excerpts:

❖ Midwife 1 from Vhembe district continued:

...but anyway, if the pregnant woman is experiencing repeated preterm labour and birth, you need to refer the mother to the doctor or obstetrician who will discuss the problem with the mother and assist the mother with planning and timing of her future pregnancies.

The statistical results confirmed this practice as about 90% of the participants had disagreed with the statement under ANC (Table 4.2), which stated that all women who needed attention were referred to other health team members. In support of the above, South Africa had established a team of midwives who deal with all low risk pregnant woman assisting them with initial visit assessment and thorough history taking, doing blood tests to identify risk of preterm labour. In addition, midwives do the abdominal palpation and monitoring of the foetal well-being by antenatal cardiotocograph non-stress test and foetal kick count. She also does antenatal psychological health assessment to rule out stress that can cause preterm labour and birth. She then refers all women at risk to the next team member in this case an advanced midwife who will take over (Davidson *et al.*, 2012).

An advanced midwife will provide intensive specialized care to the woman and provide the woman with refined expertise judgement. Also, an advanced midwife will manage

and deliver the mother with preterm labour. Advanced midwives are trained with specialized skills of neonatal resuscitation and will be able to assist the preterm neonate to establish and maintain respiration, hence reduce preterm deaths (Davidson *et al.*, 2012). The neonatal nurse will take over the preterm neonate in the intensive neonatal unit and provide expertise care. She will collaborate with dieticians and lactation consultants to plan and provide the neonate with adequate nutrition for growth and immunity boosting so that the neonates survive the preterm death. Midwives collaborate with occupational practitioners to establish and maintain motor reflexes and prevent unwanted disabilities and optimize normal functioning, and she links the mother to the support groups on discharge in the community as a continuation of care to the neonate (Davidson *et al.*, 2012).

In addition, the United States Agency for International Development (USAID) *Report on Saving the Children* indicated that the involvement of a multidisciplinary team in the implementation of KMC guidelines in 70 countries practicing KMC brought much improvement and most preterm babies' lives were saved. The team members included paediatricians who were involved in conduction of preterm birth and made sure there is proper resuscitation of the newborn and maintenance of spontaneous respiration, midwives who established immediate KMC and maintained prolonged KMC, provide infant daily weight monitoring and supervised feeding until the newborn is discharged and the home-based care trained assistant who supervised the mothers continued KMC at home and until the newborn weight is satisfactory (Broughton *et al.*, 2013)

4.5.1.4 Sub-Theme 1.4: Description of Health Education Content Provided to Women During ANC, in Labour and Postnatal Period

Most participants could describe the content to be included when giving health education to women during pregnancy, labour and the postnatal period. During the antenatal period, midwives advised pregnant women to eat a well-balanced diet for

proper nutrition and growth of the baby, good nutrition also boosts the immune system of the pregnant woman. The stable immunity fights against infections and prevent the occurrence of infections, including HIV that predisposed the pregnant woman to preterm labour and birth (Dror & Allen, 2011).

Women were also counselled to take an HIV test and those who were found to be HIV-positive were initiated on ART to reduce viral load that increased the risk of preterm labour and birth. Women were advised about the signs and symptoms of STIs and had to report any infection for proper management to avoid complications, including preterm labour and birth. Women were screened for malaria and were given treatment as well. The malarial *Plasmodium* parasite destroys haemoglobin and causes placental bed degeneration and the release of oxytocin that would stimulate the preterm labour and birth (DOH, 2016).

Participants direct quotations or excerpts:

❖ Midwife 10 from Sekhukhune district:

The pregnant woman must see to it that she is always away from infectious diseases, and then again if she sees that she have the venereal diseases she must come to hospital to get some treatment.

Of the participants, 98.1% agreed that midwives screened and counsel patients for STIs, including HIV, and 96.2% agreed that women were screened for malaria infection as this is the number one cause of preterm labour in Limpopo Province. In support of the above, various authors stressed that all pregnant women need to be advised to stick to one partner or use condoms to prevent infections. Those with STIs need to get oral antibiotic therapy, including Ceftriaxone, Ciprofloxacin, Ofloxacin or Revofloxacin, however, additional treatment may be needed to treat both partners. Pregnant woman can be given IMI Ceftriaxone plus Erythromycin or Ampicillin or Amoxicillin and continue to use condoms until the infection is cleared (Davidson *et al.*,

2012).

Participants direct quotations or excerpts:

❖ Midwife 5 from Vhembe district said:

Yes, and then we encourage them even taking the well-balanced diet, counsel them about STIs, about them all, also HIV and then they are counselled if they see any alarming signs they need to report to us. And then you palpate them, you determine the gestational age if it is doubtful refer.

In support of the participant, a good diet for pregnant women includes food rich in vitamin C, which boosts immunity, folic acid and iron that increase the level of haemoglobin and reduce the risk of anaemia. Increased levels of haemoglobin boosts the immune system and reduces viral load in the body of a pregnant woman. A decreased viral load reduce risks of inflammation and degeneration of placenta, a healthy placenta will then maintain the pregnancy until term (Dror & Allen, 2011).

Participants direct quotations or excerpts:

❖ Midwife 3 from Vhembe district:

I think mostly girls because is easy to them and they are mostly affected, boys are not even interested, I think also classes of young women those gravida 1 ,2 to come to the health education classes and family planning to encourage spacing. Jaa, even prevention of HIV and this venereal disease because this causes preterm birth. Even teaching these girls that when they see their mothers eating soil they must not think is nice because it causes worm infestations and anaemia.

In support of the participants, a study in Sweden indicated that lack of health education on sex and pregnancy issues in school boys and girls at secondary school led to many complications. The school girls were using pornography viewed from the internet to learn about sex and ended up pregnant. The boys used information to indulge in risky

sex without using condoms. Then the boys then blame girls of being ignorant of using contraceptives to prevent themselves from pregnancy. This led to increases in preterm births and deaths as the girls opted to use abortion as a solution to the unwanted pregnancy (Ekstrand et al., 2007).

Another study in Ethiopia indicated that because education was given to women during delivery at hospital, their first and second baby had a positive influence on their behavioural change this group showed improvement of utilizing the health facilities for delivery compared to those who had delivery at their homes. This improvement came as a result of good practice by midwives who gave health education to all women according to their needs before discharging them (Arba *et al.*, 2016). Another study indicated that during the postnatal period to promote chance of preterm infant survival, midwives need to provide the mother with supportive care. A midwife needs to orientate the woman into the NICU to make the mother understand the machines and all tubes connected to her baby, this will allay the anxiety and allow the mother to feed her baby and properly care for the baby.

Midwives should teach mothers on the family-centred support care and to always wash their hands when handling their babies to reduce infection as preterm can catch infections quickly due to immature immunity. Proper education in the neonatal care increases the optimal care of the neonates, hence reducing preterm birth (Davidson *et al.*, 2012).

4.5.1.5 Sub-Theme 1.5: Existence of Referral System Used Which is Guided by Women and or Preterm Infants' Conditions

Most midwives were complaining of the referral system in case they are faced with a patient who need referral to a level 2 or regional hospital. The process was long and tiresome and there seemed to be no specific person dealing with referral in the receiving hospital. The patient will be delayed until the woman delivered a preterm

neonate in a level 1 hospital with less equipment to make the preterm baby to survive leading to death of the preterm baby; this was frustrating to the nurses and doctors from the referring hospital. This was because the referring hospital was sometimes accused as shunning responsibility or staff referring was regarded as lazy or lacked competency to handle the patient. Midwives strongly indicated that they needed support from the managers concerning referral to a level 2 or 3 hospital.

Participants direct quotations or excerpts:

❖ **Manager from Capricorn district:**

In the neonatal units we are lacking clear protocols, the only clear protocol I have is the one on referral to KMC and referral of preterm babies to Mankweng hospital.

Table 4.4 shows that 13.8% of the participants disagreed that all units had well-explained midwifery-centred policy guidelines supporting midwives during the execution of quality care to reduce preterm labour and birth in the obstetric units of the Limpopo Province. Thus, there was still a shortage of some specific and well-explained guidelines for the preterm care. Statistics also showed that the neonatal trained nurses who were directly involved with the preterm were neutral (50%/50%) in this respect.

In support of the participants' responses, the protocol available indicated that preterm neonates with a weight less than 1000-1500 g and are sick, those with respiratory distress and recurrent apnoea need transfer to a level 3 hospital (i.e., Mankweng Hospital). It also listed the precautions to take before referral, for example, names, secured airway, reliable intravenous line, vital signs and giving of all medications. The baby needs to be in a warm incubator or skin-to-skin contact to promote heat and prevent cold stress. The midwives need to inform the recipient hospital and remain monitoring the neonate while waiting for removal to the level 3 hospital (DOH, 2014).

They said so as they were meeting some resistance when transferring patients. The resistance hit back negatively on patients with complications as they were delayed, patient ended up delivering the preterm babies in understaffed, underequipped level district hospitals, hence increased preterm births and deaths.

In 2009, the WHO approved guidelines that clearly described the recommended care of the newborn according to their gestational age, type of sickness and urgency of care. The guidelines outlined care immediately after birth, cord clamping and cord care, initiation of breastfeeding and KMC (WHO, 2009). The guidelines further specified the correct care for preterm babies and the low birthweight. In the case of preterm and low birth weight, the recommendations were on the prevention of hypothermia by providing warmth, infant feeding and skin-to-skin care (WHO, 2009).

Participants direct quotations or excerpts:

❖ **Manager from Sekhukhune district:**

Yes, we need support we need those big people up there in Polokwane, doctors, nursing staff to come down to us and assist us because to be honest with you, our doctors do struggle to transfer patients to Polokwane, we have patients suffering because of that attitude.

Table 4.6 shows that more than 50% of all participants in the obstetric units agreed that there was less support for the midwives during the provision in the obstetric units of Limpopo Province.

The midwives are expected to write referral notes according to the SBAR (Situational-Background-Assessment-Recommendation) form. The **S**ituation includes details of the patient starting with the personal data, blood pressure, pulse, respiration, urinalysis, foetal well-being and haemorrhages. **B**ackground includes parity, present foetal status, risk factors antenatal, labour, postnatal, treatment given as stat dose and in progress. **A**ssessment includes nursing diagnosis, potential risks on the mother

or foetus and anticipated deterioration. Recommendations include recommended care like emergency Caesarean birth, writing the response if the patient is send back to the clinic for continuity of care. The referring midwife needs to append the signature and designation, time, date and person communicated to whilst arranging the transfer (DOH, 2016).

In support of the participant, Mojaki, Basu, Letskokgohka & Govender (2010), indicated that referral systems between district and regional hospitals still had a serious challenge that needed prompt assessment and intervention by the health care managers. Akande (2004) also indicated that there were some problems of referral systems in primary health care facilities of Nigeria and their teaching hospitals which left the patient care in jeopardy and frustrations to the health care workers.

Participants direct quotations or excerpts:

❖ Midwife 15 from Capricorn district:

In case the patient reports labour at the clinic you first give the oncolytic and then refer to the level three hospital where there is advanced equipment and specialist doctors.

The *Maternity Guidelines of South Africa* outlined the complications that need referral from the clinic and level 1 hospital to level 2 and level 3 hospital. The complications include preterm labour, multiple pregnancies, intrauterine growth restrictions, haemorrhage, history of recurrent abortions, existing medical and pregnancy induced conditions that can predispose the pregnant woman to preterm labour and birth like hypertension, diabetes mellitus, infections like malaria, and sick neonates like preterm and meconium aspiration (DOH, 2006).

4.5.1.6 Summary of Theme 1

Regarding the role of midwives, most participants agreed that midwives could carry out their role as prescribed by the SANC. The regulation relating to the scope of practice of persons who are registered or enrolled under Nursing Act, No. 33 of 2005, R. 2598, and regulation relating to the conditions under which registered midwives and enrolled midwives may carry on their profession under the Nursing Act, No. 33 of 2005, R. 2488, the framework chosen to underpin the study, outlines the functions and roles which entail acts or procedures which the midwife applies when caring for the mother and child in the course of pregnancy, labour and puerperium. The midwives could book the woman at 12 weeks gestation to diagnose health needs and assisted the women in attaining optimum health; monitored the progress; diagnosed deviations from normal and medical conditions like hypertension; administered treatment action prescribed by the other team members like medical practitioners; prevented complications and referred the complications to doctors; promoted hygiene; breastfeeding; nutrition; elimination and exercises.

4.5.2 Theme 2: Challenges Faced by Midwives Whilst Executing Their Role During Antenatal, Labour and Puerperium (Neonatal) Period

Challenges were described as circumstances not enabling the midwives to work to their full scope of practice. Other countries, for example, Australia and New Zealand though were leaders in quality maternal and child care faced challenges such as lack of skilled birth attendance (midwives, obstetrician and specialists in midwifery practice). Lack of support and enabling environment, access to basic supply and emergency care services (Kildea *et al.*, 2010). Most African states lacked skilled health care professionals, material and supplies and infrastructure. In addition, there were poor communication skills between the staff and managers.

The few available staff were overwhelmed by workload, poor relations between supervisors and midwives, lack of resources leading to stress and burnout (Waiswa

et al., 2010; Mhlanga, 2008; Iyoke *et al.*, 2014). Challenges in South Africa included shortage of midwives and skill mix (three professionals group including midwives, neonatal nurses, general practitioners with obstetric training and specialist obstetricians). There was an increase of preterm births in rural areas resulting in emotional burden of the already stressed midwives causing psychological burden and burnout amongst midwives (Mhlanga, 2008; NPMMC, 2008-2010).

This study revealed that midwives faced challenges that retarded their role leading to the increased preterm births and deaths in Limpopo Province. The factors retarding their role included shortage of staff both doctors and nurses, inadequate or no emotional and psychological counselling to midwives when faced with stressful situations. There was poor and ineffective communication amongst midwives which include poor report giving and taking leading to missed opportunities and lots of mistakes were committed in provision of care to patients with preterm labour or preterm neonates leading to increased rate of preterm births and deaths. There was delay or long processes followed to go for advanced skills training, for example, advanced midwifery or neonatal training. The theme was confirmed by results wherein 65% of participants disagreed with the statements that midwives were always provided with all equipment (incubators, CTG, servos/heaters, phototherapy lamps, KMC rooms) and many others. About 62% of the participants disagreed with the statement all units had doctor or nurse specialists designated for neonatal units for 24 hours, consequently the sub-themes listed below emerged.

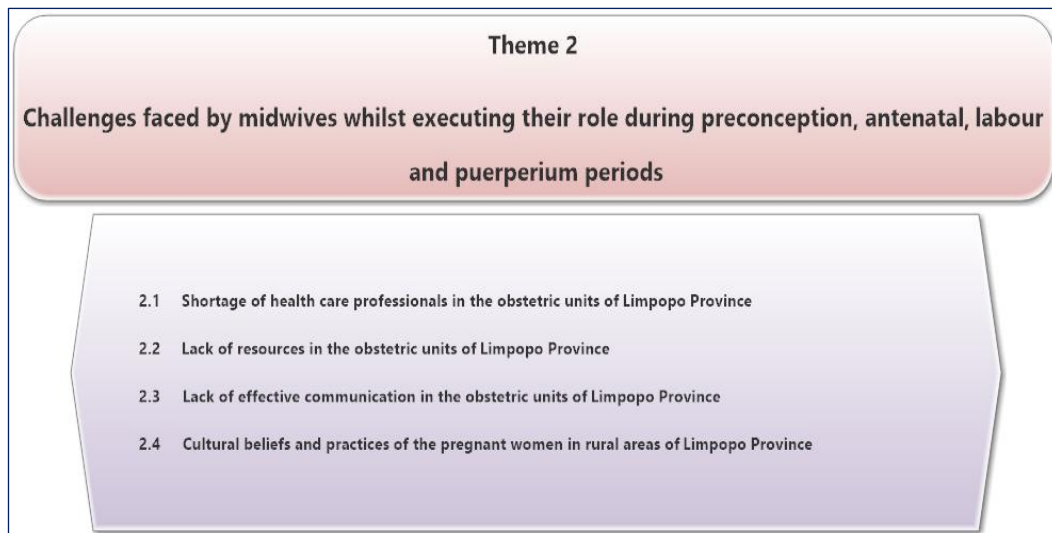


Figure 4.5: Sub-themes from theme 2

4.5.2.1 Sub-Theme 2.1: Shortage of Health Care Professionals in Obstetric Units of Limpopo Province

All interviewed participants indicated the shortage of staff (midwives, neonatal nurses and doctors) was the main factor contributing to substandard care considering the influx of patient on a daily basis. Shortage of staff was linked to non-replacement of midwives who retired and who went to higher positions and those who passed on, poor working conditions due to shortage of equipment and medical supplies. Some midwives cited the issue of unmet expectations of incentives or salaries or any other agreed upon benefits and some midwives attributed shortage of health care professionals to absenteeism due to illnesses caused by overworked and emotionally stressed midwives.

Participants direct quotations or excerpts:

❖ Manager from Sekhukhune district:

Jaa, my first challenge is staff, I don't have enough staff and then the few staff that I have I am not happy about the skills, because you have the patient you need to apply the good quality skills to prevent complications. Now I have got shortage of staff, poor skills, and they are usually absent

because they are ill, because they are tired.

Table 4.4 shows that 38.2% of the participants agreed that all units have doctor/nurse specialists designated for neonatal unit for 24 hours whilst 61.8% disagreed with the statement; 25.4% agreed that all units have adequate staff for 24 hours whilst 74.6% disagreed with the statement.

A study on innovation in nursing supported the above findings by indicating that it is so challenging to bring in new methodology and modern devices to enhance nursing practice due to insufficient nurses, midwives and nurse leaders. This was a challenge because there were few midwives or nurses to work on the frontline and innovate changes. This also poses a challenge as innovation and change needed highly competent midwives and nurses and inversely the few available staff lacked that competency and innovative ideas (Watkins *et al.*, 2016).

Participants direct quotations or excerpts:

❖ **Midwife 1 from Vhembe district:**

Mmmmm. With the challenges I can say first with that one of not having enough staff, no enough resources so that we can help the patients. Another thing 'eeh' we are having a challenge of, can I say 'eh' limited skills or human resource as sometimes when we want to report the patient to doctor, the doctor is busy in theatre in that time and then you are having a patient that need 'eh' urgent help and the doctors are faced with too much of a challenge.

A study in Kenya supported the quotation by indicating that there is still a challenging high rate of maternal and perinatal morbidity and mortality, irrespective of being assisted by a skilled health care provider. Key challenges highlighted by both health workers and policymakers included: addressing staff shortages and working conditions; ensuring staff competencies and training; recruiting, maintaining and motivating staff concentration (Mullei *et al.*, 2010).

Participants direct quotations or excerpts:

❖ Midwife 5 from Vhembe district:

Yoo, we have shortage of staff, sometimes the patients are full, we need to monitor regularly the patient but there is no enough staff machine is only one. The treatment for tocolytics is sometimes out of stock.

Table 4.2 illustrates this point in that very few participants (33%) agreed with the statement “There is a trained neonatal/paediatric nurse covering all shifts”.

In support of the above sentiment, a multinational study in 54 countries indicated that there was a challenge to provide women with one-to-one midwifery care to reduce occurrence of preterm births and deaths. The notion of one-to-one midwifery care was first proposed in 1980 due to shortage of resources to assist in the implementation of quality maternal and child care since preterm births and deaths still exist. The methodology proved to be robust due to the globally acknowledged issue of staff and material shortage (Ball & Washbrook, 2010).

Shortage of staff led to poor thorough assessment of pregnant women though they booked in time leading to missed opportunity of picking up the predisposing causes of preterm labour and poor classification of pregnant women as high or low risk. Antenatal education was not done, and patients lacked knowledge on how to pick up preterm births and report for assistance. Shortage of midwives led to poor supervision on baby feeding immediately after birth, there was no promotion of exclusive breastfeeding which the best feeding option for preterm babies and poor handwashing is led to spread of infection in the preterm units. Almost all (100%) respondents in the statistical analysis did not agree with the statement of availability of staff around 24 hours.

Participants direct quotations or excerpts:

❖ **Midwife 15 from Capricorn district:**

Eeeeh shortage of personnel, we do not have enough personnel, that one is known everywhere in South Africa, nurse are not replaced at all, we are only 8 midwives for both night duty and day duty including those going on leave or are sick, imagine how do we balance the shifts.

❖ **Manager from Sekhukhune district:**

The main challenge here is staff (shaking her head) no...this is not acceptable, one is expected to render quality nursing care, how because there is no enough staff, even doctors we don't have qualified paediatrician here at the district hospital.

In support of the participants, the preterm delivery should be through vaginal birth and delivery need to be conducted by a specialized team and not one person. The team should include an advanced midwife who will diligently deliver the preterm slowly with an aid of episiotomy to avoid pressure on the soft skull. This midwife is also competent in neonatal resuscitation to assist the neonate to initiate and maintain respiration. The other team member has to be a paediatrician who will be ready to resuscitate the preterm neonate in case the advanced midwife failed, the obstetrician will be available to assist with expedient delivery that reduce occurrence of brain injury and deaths (Speciale & Solsona, 2016).

Another study revealed that most managers complained of scarcity of specialist skills and lack of commitment of the midwives. Midwives indicated that they did not have advanced training, for instance, advanced midwifery and neonatology, paediatrics and neonatal nursing. Other participants also indicated that they waited for such training for many years only to be sent to training at the age of 50 when they were no longer intellectually functional. In addition, a study on substandard maternal and child care showed that both factors, institutional and staff shortage, did contribute to preterm labour and birth in private and public health care institutions. Other factors included

lack of skills on maternal health care and very old midwives had high risk of errors in provision of care due to poor adherence to guidelines and lapse of concentration. All this led to increased preterm births and deaths (Rousseau *et al.*, 2016).

Participants direct quotations or excerpts:

❖ **Manager from Sekhukhune district:**

Now I have got shortage of staff, the ones available they lack speciality skills, and they are not trained specially to care for the preterm neonates, they are just basic midwives.

Table 4.5 shows that only 50.9% of the participants agreed that all units have enough midwifery training on the care of preterm babies whilst 49.1% disagreed with the statement, and 38.2% disagreed with the statement that all midwives receive additional training on the care of preterm babies whilst.

A Midwife Specialist is a registered Professional Nurse and Midwife who has advanced expertise in Midwifery, hold an additional qualification in Midwifery and Neonatology and is registered as such with the SANC. Midwife Specialists act as leaders, clinical specialists, consultants, managers, researchers, change agents, advocates and educators in Midwifery, including Neonatal Care, and give direction at Local, National, Regional, and International levels. The presence of the advanced midwife in the obstetric unit will ensure that pregnant women with the risk of preterm labour and birth receive quality expertise care. The midwife will also act as a source of expertise or skill to assist other midwives to identify and prioritize women with risk of preterm labour and birth. Her presence in the unit will reduce the occurrences of preterm births (SANC, 2005). Moreover, a paediatric and neonatal trained nurse works with newborn infants born with a variety of problems ranging from prematurity, birth defects, infection, cardiac malformations and surgical problems. The nurses are allocated in the NICU and receive the preterm neonates (Honeyfield, 2009). She is

advanced in helping the baby breath and will use the skill to maintain preterm neonates' respiration through bag and mask as they suffer a lot of apneic attacks. She also assists to plan baby feeds according to their weight and schedule reduces hypoglycaemia which is common. She prepares and maintains warmth in the unit to prevent hypothermia which is a cause of preterm death (DOH, 2014).

To support the managers and midwives in South Africa, the SANC under the provision of Nursing Act No.33 of 2005, put in place a model of midwife specialist continuum of care that included expanded roles and competencies to improve maternal and child health especially. The model was to include advanced midwives, reproductive and neonatal health practitioners, who focused on assessment/screening and streaming preventative measures, management and rendering of care, the promotion of normal birth, and the detection of complications in mother and child, the referral and accessing of higher medical care or other appropriate assistance and the carrying out of emergency measures. SANC believed that the model would assist in reduction of complications in maternal and child health, including preterm labour and birth (SANC, 2005).

Participants direct quotations or excerpts:

❖ Midwife 15 from Capricorn district:

Eeh shortage of personnel with speciality, sometimes you see, nurses allocated to this unit are not trained for neonatal care, I am trained, but can be removed to labour ward due to shortage, the other thing is that today they allocate this nurse tomorrow that one, so in terms of that we are not able to control our service on how you are going to manage these new-born babies, Eish, today is this nurse, tomorrow is that other one.

In support of the quotation, a study in the Netherlands indicated that there was an increased death among neonates born with a variety problem like preterm neonates. These preterm neonates had asphyxia due to lack of competency of the birth

attendants who were lacking speciality skills of monitoring foetal heart rates continuously and were not able to pick the foetal distress in time. The other factor was that due to lack of expertise skill they delayed to transfer these preterm asphyxiated neonates to the other level of care and were not able to help the newborn babies initiate and maintain the respiration and consequently increased death of the preterm neonates due to asphyxia (Evers *et al.*, 2013). In the same area, another study indicated that there was unacceptable antepartum stillbirth due to poor management of pregnancy induced conditions such as hypertension, pre-eclampsia and eclampsia due to lack of specialist intervention in the maternal and child health units (Evers *et al.*, 2013).

A study in South Africa on professional nurses' perceptions of skills required for performing preterm infants' follow-up assessments outlined skills that would be able to help preterm babies survive. The skills were to identify the preterm neonates, assessment skills, helping baby to initiate and maintain breathing, neonatal nurse practitioner trained to work in NICUs. The study also indicated that there were no professional postgraduate training concerning such. Preterm infant assessment is provided in South Africa and medical representatives were the only resource persons for preterm neonates (Cordewener & Lubbe, 2017).

Participants indicated that due to lack of quality skills some midwives were failing to read and understand the available guidelines. Some midwives due to lack of proper expertise had a tendency to misinterpret the guidelines, policies or circulars on how to provide specific midwifery care. The misinterpretations were also ascribed to fatigue and overworked midwives. This was confirmed in Table 4.4 wherein very few (18%) of the respondents agreed with the statement "All midwives have time to conduct research and use evidenced-based care". Slightly over half of the participants confirmed that "All units have enough midwifery training on the care of preterm babies", while about 49.1% agreed that "All midwives receive additional training on

the care of preterm babies”.

Participants direct quotations or excerpts:

❖ **Manager from Sekhukhune district:**

Of course, if we do fail, I know our coping mechanism is not the same, when you read you can do best, when I read I don't understand, then I don't do best. But if you manage the patient and you fail you refer.

❖ **Continued further and said:**

It also depends on your skills, some may not understand the guidelines, Jaa, for the support “eeh” I can say the trainings for the development of skills in nurses, because nurses need to be regular in serviced, jaa sometimes when they are familiar to things they do relax so they need in-service training to revive them.

Table 4.5 shows that 74.6% of the participants agreed that there is a programme on the in-service or periodic drills on the HBB skill whilst 25.4% disagreed with the statement, 40.8% agreed that all units have a mentor available for 24 hours whilst 59.2% disagreed with the statement.

In support of the participants' quotations, the WHO encourages all health care practitioners to refer to the guidelines when managing the patient, the midwives also are included in this case to use evidence-based care to improve maternal and child outcomes. The WHO encourages the development of the guidelines by experts in the field to yield good quality care in this case care of pregnant women at risk of preterm labour and birth (WHO, 2014).

Participants direct quotations or excerpts:

❖ **Midwife 15 from Capricorn district:**

In neonatal ward I don't have the guidelines, the ones that I saw sometimes here it was old and it was the policy for referral to other hospitals, KMC, and

the other one was for limitation of visitors.

In support of the participants' views, the Department of Health in South Africa had developed guidelines on the routine care at birth and management of the sick and small newborn in hospitals. In Limpopo Province, it is called Limpopo Initiative for Newborn Care (LINC) Guidelines. The guidelines outlined TRIAGE which is assess and classify the neonates. After classification you treat observe and provide care according to priority in case of preterm neonates you promote warmth, council the mother, provide feeds to prevent preterm death (DOH, 2014). Graham, Beardall, Carter, Tetroe & Davies (2003) argued that Canada was good in developing guidelines in patient care but neglected the issue of dissemination and proper filing as well as proper evaluation of the guidelines' effectiveness this led to continuing substandard care and poor improvement in neonatal care and, hence, increased preterm deaths.

4.5.2.2 Sub-Theme 2.2: Lack of Resources in the Obstetric Units in Limpopo Province

Participants indicated that there were no equipment starting from the blood pressure (BP) machine to regulate blood pressure of pregnant women. If BP is not monitored and controlled, it causes premature labour and delivery due to vasoconstriction effects on the blood vessels resulting in an inadequate nutritional supply to the placenta as well as infarcts. Placental infarcts before 37 weeks will cause release of oxytocin and consequently preterm labour and birth. Preterm neonates are born with lack of brown fat to generate heat and their muscle activity is not well developed, hence, they fail to shiver and generate heat in the extrauterine life, this predispose them to hypothermia (Harrison, 2012). There were few incubators, and some have not enough blankets to prevent hypothermia in the preterm neonates. Shortage of equipment is a factor that also impacted on quality midwifery care for both mothers and preterm neonates.

Participants direct quotations or excerpts:

❖ **Midwife 5 from Vhembe district:**

Yo, the main challenge is equipment as we are saying that incubator is no more working and we were having 4 preterm babies the other ones we transferred to Mankweng unnecessarily and the other ones you see there they are less than 1.5 kg but we could not put them in the incubators because we are having only 2 working, but we are having nasal prongs, nasogastric tubes that we use them to feed the neonates. We do not have walled oxygen we are having this cylinder method and is failing us because even if it stays full and is use and the level is dropping the CPAP do not work properly. Oh, I forgot the scale is also not working because there is no batteries and we use to buy unfortunately we sometimes forgot and we need the scale to assess the progress of this babies. Doctors are there and they do come when you call them, the doctors part is not a problem.

In support of what the midwives said, Table 4.4 shows that only 34% of the participants agreed that midwives are always provided with all equipment needed to provide quality care whilst 66% disagreed with the statement.

The National Perinatal Morbidity and Mortality Committee Report 2008-2010 outlined the survey of equipment, which was done by Nkwanyama & Velaphi in neonatal units of South Africa. The report showed that 64 district hospitals accounting for 68% of total hospitals lacked radiant warmers, 63 lacked resuscitation equipment and 19 had no suction machines, while 82 lacked equipment to monitor vital signs. The shortage of equipment affected the care of women with preterm labour and preterm neonates negatively as midwives would not get the opportunity to provide nursing care procedurally as there was no equipment to perform such procedures to save preterm neonates. There were not enough resuscitation machines to assist the preterm to initiate and maintain continuous respiration. Midwives did not execute their duties procedurally where there were no gloves, and this interfered with their functions as role models and mentors to student midwives who will be champions in saving the lives of preterm neonates (DOH, 2008-2010).

In addition, literature enlisted the ideal equipment in the NICUs as follows; **Incubators** which provide the preterm neonates with neutral thermal environment through warming the mattress. Maintain core body temperature up to 2 hours after delivery. Prevent insensible water loss because is closed compared to radiant warmer to provide warmth to preterm neonates. This was found to reduce death of preterm neonates as it prevents hypothermia (Soll, 2008). **Resuscitation units** with light to visualise the trachea during ventilation, radiant warmer to maintain warmth and prevent cold stress. Source of medical oxygen firm warmed mattress. **Portable oxygens** for supplementing breathing when transporting the neonate to nursery. **Oxygen blender** for proper gas mixing (DOH, 2014). **Phototherapy units** to reduce bilirubin levels as preterm are prone to jaundice due to immature live and immature red cells. Pulse oximeter meter for monitoring vital signs and check the progress. **CPAPs** with humidifiers for positive airway support, infusion pumps for intravenous therapy to mention but few. The availability of all equipment in the unit was associated with positive outcomes in preterm neonates (Whittaker *et al.*, 2011).

Participants direct quotations or excerpts:

❖ Midwife 1 from Vhembe district:

Yoo, because I am in labour ward, okay I will talk about the labour ward, at the labour ward we don't have enough equipment's like the CTG machine we are having only one CTG machine and sometimes we find that even the one available is not working properly, when you read and compare the foetal heart rate on the machine and on the paper and again "eish" we are having one BP machine and we are supposed to take the high risk patients, first stage patients and other women in labour, "hey" really we don't have equipment here.

Another thing Mmm...we have one resuscitation place in the labour ward we have five rooms and normally we are using all four rooms and you may find that if there is another nurse resuscitating the baby, me I am delivering and while delivering my baby is not well I am supposed to wait for her to finish that baby and when I run to neonatal unit they said no this baby is

supposed to see the doctor before it comes to the unit you see , we are having a problem especially here in labour ward. Even the mattresses for resuscitation are not well.

Table 4.5 shows that the responses of all categories of participants on the availability of resources were “Disagree,” which was above 60% implying that availability of resources was poor to even assist midwives in execution of their roles during maternal and child care.

A study in Nigeria which is the third highest country contributing to global escalating preterm births and deaths, showed that there are difficulties in saving the lives of preterm babies due to the scarcity of resources, especially in poorly equipped neonatal units. They lacked resuscitation machines, radiant warmers, incubators, CPAP machines, as well as separate intensive neonatal units for preterm neonates only. In addition, they lacked protocols on how to prevent preterm labour and birth to save the preterm babies' lives (Iyoke *et al.*, 2014).

Furthermore, a study in Ghana showed that lack of equipment in neonatal units contributed to the increased rate of preterm births and deaths in the country. They also lacked advanced machinery like resuscitation units, medical supplies like walled oxygen, CPAPs, weighing scales, radiant warmers, incubators, even non-sophisticated equipment like bag and masks were not available. The shortage decremented the care in maternal and child health leading to increased preterm labour and birth (Vesel *et al.*, 2013).

Participants direct quotations or excerpts:

❖ **Midwife 8 from Sekhukhune district:**

The other challenge is that we run short of other medicines for example surfactant in such that we end up giving insufficient care, and another thing is this that we are running short of surfactants and we end up borrowing in case we have emergency.

In support of the above, a study in the USA indicated that preterm neonates are born with immature lungs and fail to produce enough surfactant and, as such, experienced respiratory failure secondary to surfactant deficiency. The best treatment for the neonate's surfactant replacement therapy starting from ANC of all women risk of preterm labour. The replacement continues to be given to all neonates who were born before term to assist them in initiating and maintaining continuous extrauterine life respiration (Engle, 2008).

Results of this study indicated that there were shortage of equipment, materials and medical supplies in most obstetric units of Limpopo Province. The few existing equipment were broken or dysfunctional. The other problem was unavailability of specific guidelines and lack of understanding by midwives on some of the guidelines.

Participants direct quotations or excerpts:

❖ **Midwife 2 from Sekhukhune district:**

We do not have the gloves, the (CTGs) we use to have them but now they are damaged no longer working, we only have two that are working but the others are not working. Even those that are working we could not do tracing because they lack tracing papers that we use for non-stress test, it was difficult, but even for detection of foetal distress it was more difficult because we do not have enough CTGs, but the space is not available. We have 6 labour rooms but only two CTGs.

A report on common constraints and incentive problems in service delivery by Overseas Development Institute (ODI) indicated that most developing countries were buying cheap materials and equipment due to poor distribution of funds following lack of credibility in the political promises politicians made to citizens, poor monitoring and supervision of procurement services as well as corruption acts by senior managers. This led to buying of machinery with short lifespan that become dysfunctional in the long run. This had affected service delivery in many public sectors, including hospitals

(Wild *et al.*, 2012).

Most participants indicated that there was shortage of drugs and other medical supplies like medical air/oxygen needed to use in servos for life support to premature babies as well as surfactants used to increase lung compliance and assist the premature neonate to breathe. Most drugs and supplements to enhance life support to premature neonates were found in level 2 hospitals which are usually very far from district hospitals. This factor impacted mostly on the care of the preterm babies comprising the outcomes, hence increased preterm births and mortalities.

In support of the participants' responses, a study in Ethiopia showed that there was increased preterm labour and birth which related into neonatal complications in almost 80% of patients receiving care due to lack medical supplies related to poverty and low socioeconomic status of the country (Girma *et al.*, 2013).

Participants direct quotations or excerpts:

❖ Midwife 1 from Vhembe district:

We don't have the gloves, the (CTGs) we use to have them but now they are damaged no longer working, we only have two that are working but the others are not working. Even those that are working we could not do tracing because they lack tracing papers that we use for non-stress test, it was difficult, but even for detection of foetal distress it was more difficult because we do not have enough CTGs, but the space is not available. We have 6 labour rooms but only two CTGs".

Similarly, a study in Malawi revealed that chronic lack of materials and supplies, the persistent lack of human resources and inadequate clinical skills of available health workers plays major role in substandard management obstetric haemorrhage leading to death of women (Beltman *et al.*, 2013).

Participants direct quotations or excerpts:

❖ Midwife 4 from Vhembe district:

For treatments we do not have surfactant in our unit is only found in Mankweng. We are supposed to have Salbutamol for tocolysis, currently is not available, gain we do not have Dexamethasone to give to this preterm neonate for assisting them with breathing, hey, and is a problem.

In Cambodia, institutional factors such as limited capacity and shortage of medical supplies resulted in increases in rates of preterm labour and births in public sectors. The preterm neonates were dying due to lack of surfactant therapy that assist them to establish and maintain respiration (Mansoor *et al.*, 2013).

Midwives complained of equipment and machines which were supplied but worked for a short period and became unusable. Midwives lacked weighing scales to monitor weight gain to be able to diagnose poor weight gain which can be indicative of malnutrition or anaemia that may result in preterm labour and birth. Lack of CTG machines to monitor foetal heart rate and diagnose foetal abnormalities, compromise foetal growth. They lacked haemoglobinometers to estimate haemoglobin levels of the pregnant women.

When these machines were broken, long processes to fix them or procure new ones exacerbate the situation. They did not have enough servos/radiant warmers to provide warmth to the preterm neonates. There were no plans in place to maintain the broken machines. This frustrated them more as it will also take long to fix the machines due to lack of finance. Lack of high quality equipment affected the care provided to women at risk of preterm birth, including care to preterm neonates, and hence increased preterm birth and deaths in Limpopo district hospitals.

Participants direct quotations or excerpts:

❖ **Manager from Sekhukhune district:**

Another challenge is that of servicing equipment's that took a long process because you have to do follow the procurement process and then is really a challenge and we are failing to diagnose patients.

Is a challenge, the challenge is the finance, Jaa I always use to motivate for more nice equipment's because I am smart also I want to be smart, so but we have got a challenge like for the CTG, one was bought by the province, but we have challenge for servicing and repair of the equipment.

Okay, we also give the baby the antibiotics prophylaxis as it is prone to infections, they must also take even the bassline blood test, and furthermore we give the new born routine care. Then we need to check the weight of the baby weekly, and some of the preterm you find that "ba" they have anaemia, of which we check the Hb, every week on Wednesdays i.e. every Wednesday, we are unable do all this because you find that we lack Hb meter, weighing scale and if weighing scale is available is off because batteries are flat and were not bought due to the long procurement process.

The limited resources status and developing countries lacking proper infrastructure and equipment as well as machinery to provide quality health care, including the care to preterm babies, impact negatively on the neonatal and maternal health. This occurs because most of the sophisticated machines and quality drug therapies are expensive, thus most of the obstetric units in these countries were faced with scarcity of resources and poorly equipped neonatal units (Lawn *et al.*, 2009). Studies in Ghana as an example of a low socioeconomic country revealed that though there were masks and bags they failed to provide proper assistance due to their low to moderate quality score (Vesel *et al.*, 2013)

Similarly, a study in Kenya showed that the public maintenance organization does not have proper management of the medical equipment. Hospitals were found with poor and improper management of medical equipment which includes selection, purchase,

installation and maintenance. Proper purchasing of quality equipment and maintenance was important for ensuring continued readiness of the service, positive impact on the safety and effectiveness of health services. It increases the lifetime of the equipment and provides information essential for equipment management (Mutia *et al.*, 2012).

Participants direct quotations or excerpts:

❖ Midwife 5 from Vhembe district:

Another challenge is concerning the equipment, we do not have anything, we only have one CTG, and then if we have many patients with foetal distress is a problem we have to use that only one.

❖ In South Africa one patient once said:

There is a poor management at the hospital, the broken X-ray machine being a prime example. The hospital grounds and buildings are totally neglected.

Some hospitals in South Africa have no equipment, other hospitals lack cubicles to admit and examine patients (The South African Human Rights Commission, 2015). The other challenge indicated was that the physical structures available to provide obstetric services were very old, some were old and dilapidated and cannot be renovated anymore. One institution was still using that ancient method of having all units starting from general, paediatrics, TB and maternity in one building.

There is no separate maternity unit solely for maternal, child and women health. This frustrates the midwives as they also shared the doctor with all other units, making their doctor not to pay attention to these small preterm neonates. The factor of lack of space and separate rooms for maternal care impacted negatively on the provision of quality care to antenatal women leading to increased complications, including preterm birth and delivery. Lack of a nursery or separate preterm units led to mixing of preterm

infants with other sick infants compromising their chances of survival as they easily contract infections due to immature immunity and poor adaptation to extrauterine life, hence increased preterm morbidity and mortality.

Participants direct quotations or excerpts:

❖ **Manager from Sekhukhune district:**

You know what as I said we are not having specific unit for that, this is all in one hospital is just a neonatal unit that is now on its area, but the rest antenatal, postnatal, labour is all mixed up.

Yooo, we need space really, we need space, this hospital was opened in 1961 this is the original structure, mixed up, the only new building is the OPD that you see in that other side which was opened in 2005. Presently we are serving a huge community we need space. Our mothers I think they also need more involvement in the care, but space is the problem, space for kitchen, TV room, or OT room. Please we need a new open maternity with open space labour room, postnatal, neonatal and KMC we are delivering 144 per month.

In South Africa, the Treatment Action Campaign and Section 27 Investigation Report indicated that building of clinics and hospitals are old and dilapidated not suitable to use for health care service (The South African Human Rights Commission, 2015).

Mark Heywood, Executive Director, Section 27 said:

The poor quality of many facilities hampers the delivery of health care. They often lack electricity and running water. Many hospitals are too small for the number of people served and some are literally falling apart.

In addition, a report by ODI from several countries, including African states, indicated that due to political conflict of interest, mostly in states with multiparty participation in governance, there was deterioration in infrastructures of service deliveries, including hospitals and primary health care facilities. This was because the large amount of

money as directed to enriching self in the form of high salaries and incentives. This condition led to many states not building nor renovating the available facilities to promote quality service delivery to reduce preterm births and deaths in the obstetric units (Wild *et al.*, 2012).

4.5.2.3 Sub-Theme 2.3: Lack of Effective Communication in the Obstetric Units of Limpopo Province

Communication is the art of creating and sharing ideas, involves getting information from one person to the other and relayed while retaining the same in the content and context. This is a good vehicle in an organization that promotes quality service provision (Lunenburg, 2010). In this study, communication means sharing of information from managers to midwives and between midwives in the provision of quality care to preterm neonates in Limpopo Province. Lunenburg explained important skills of communication, including listening, listening skill involved open-mindedness by managers and being able to pick up nonverbal communication, attitude and state of mind.

Lack of communication can increase rates of preterm labour and births in Limpopo Province, as well as stress and frustrations experienced by midwives. The other skill was engaging the audience, in this study, it would be engaging midwives in the planning of care of preterm neonates and encouraging midwives to express their feelings, way of thinking toward the expected care of women at risk of preterm labour and birth as well as preterm neonates. Using of voice which would imply that managers need to be sure that they are audible enough when giving the midwives instructions. Writing will imply that managers need to use direct and open-ended statements in their written instruction, open-ended allowed midwives to use their acquired skills in provision of quality care of preterm neonates (Lunenburg, 2010).

Participants direct quotations or excerpts:

❖ Midwife 6 from Vhembe district:

I think is communication between the nurses is sometimes not right. This day's communication between us and managers is poor; there are no more matron rounds.

Some midwives indicated that most of the posts of supervisors were vacant due to retirement or death and were not filled. This made one midwife to be selected in an acting position leaving them short-staffed, leading to poor communication between the midwives and nurses service managers because the acting midwife may not attend all the meetings and leave the ward understaffed. This delay communication of new updates more especially new policies on preterm care, issues HIV which is also a cause of preterm labour and birth.

The other issue was that the acting midwife will not take full responsibility of the position and midwives are left with broken communication among staff, hence provisioning of quality care was disturbed resulting in increased preterm morbidity and mortality. Midwives further indicated that they face stressful situations at work like when they had delivered a stillbirth or experienced maternal death. Some midwives came with stressors from family situations either from their kids or spouses and they had no dashboard they can offload their stress.

Participants direct quotations or excerpts:

❖ Midwife 1 from Vhembe district:

And another thing I think is communication between the manager and the nurses here at the base communication is mostly not functional because here we have a vacant post of our line manager. When something happen, you find that there is miscommunication because no one is solemnly responsible of taking the issues to higher level managers, somehow we end up with communication problems, this result in demoralizations of midwives and as a results provision of low quality care to pregnant women at risk of

preterm labour and preterm neonates, therefore we are faced with high rate of preterm labour and birth.

Communication is a fundamental tool for nursing management as a social practice based on information production, circulation and exchange, involving work processes in the hospital context. However, due hierarchical level communication between nurses and managers in one of training hospitals in Brazil, this was not always easy, and thus led to interference in proper patient care and poor morale of midwives. This was because most communication from the managers was authoritative and vertical not two-ways or in a form of a dialogue. The proper communication that can enhance profit was that of two-way that allows midwives to have suggestion in the information given (Santos *et al.*, 2011).

Participants direct quotations or excerpts:

❖ Midwife 3 from Vhembe district:

Another thing that we are doing when we are engaging with the women, when we are attending the women we try by all means to communicate amongst ourselves even giving each other report about the women so that we identify and show each other those who are high risk so that we have the caution from the beginning, conditions such as “vho” hypertension.

A study done by Casey & Wallis (2011) indicated that good communication in patient care improves quality of care and prevents delay of information and also improves safety of the patient. Participants further argued that there was an essential need to ensure that staff using the care pathways receive appropriate communication skills training and that there is an opportunity for nurse managers to take the lead in proper good communication.

Participants also suggested bringing back the basics that was emphasis on peer teaching, proper and efficient changeover report giving, and efficient patient rounds amongst themselves to revive and uplift the standard of midwifery care in the obstetric

units of Limpopo Province. This was envisaged to increased staff who would provide coverage for the important roles of midwife, including teaching, mentoring and supervising. Mentoring and supervision assist in bridging the gap of theory and practice, assisting students to acquire competency and thus become competent future midwives who will prevent occurrences of preterm births and deaths in the units.

Participants direct quotations or excerpts:

❖ Midwife 5 from Vhembe district:

I think we can stress too much on peer teaching, help each other and then we do it making sure that everyone is covered.

In South Africa a recommendation was made on peer teaching it was recommended that the facilities with obstetric units need to conduct perinatal mortality meetings. In these meetings doctors and nurses prepare and present the top 5 conditions leading to perinatal morbidity and mortality. The top 5 conditions included hypothermia which is a condition wherein the newborn failed to generate heat to establish and maintain normal neutral thermal environment and consequently died due to cold stress. Hypoglycaemia which is a condition affecting preterm neonates with immature liver and depleted glucose stores and ultimately due to hypoglycaemia or low blood sugar.

Haemolytic diseases of the newborn (HDN) which is common to preterm born before 36 weeks due to vitamin K deficiency as this is deposited at week number 36. Vitamin K act as a clotting factor that prevents bleeding (DOH, 2011-2013). The hypoxic-ischaemic encephalopathy (HIE) which is common to the preterm neonates due to lack of oxygen at birth/asphyxia. Asphyxia causes hypoxaemia and ischaemia of the foetal brain and cerebral infarction, necrosis, atrophy and ultimately neonatal death (Harrison, 2008). The district health teams were also delegated to conduct peer teaching in the form of drills on helping baby breath and neonatal resuscitation (DOH, 211-2013: 2).

Participants direct quotations or excerpts:

❖ Midwife 5 from Vhembe district:

We try to stress on the conditions that lead to preterm birth and delivery, we try and stress on them, and then in-between ourselves staff we have what we call lectures amongst ourselves about his conditions so that we can be able to identify the risks before they become a problem.

In a study peer teaching observation: continuing professional development for tutor's peer group teaching was seen as a useful tool that had strengthened the tutor's collegial relationship and had built on the tutor's professional development. The practice had a positive impact and showed a vast improvement in the classroom performance. This was then recommended to become a formal requirement for all tutors as part of their professional development (Day, 2013). Participants further indicated that when there was not enough time for peer teaching report giving was going to be a tool for peer teaching. A detailed report during handing over through oral presentation by a competent midwife with a full description of preterm neonate written on the care plan, assessment and implementation forms can surface.

Participants direct quotations or excerpts:

❖ Midwife 14 from Capricorn district:

One challenge is that we no more have the time to walk from bed to bed giving report about the patient how did they sleep and on their treatment. You find that someone is giving you a verbal report saying that patient next to the tap, etc.

In support of the quotation, handing over of reports by midwives in the provision of care to patient with preterm labour could enhance continuity of care and assist the woman to receive total care that would prevent preterm birth (WHO, 2007). Effective handing over of reports among midwives during transfer of a pregnant woman with preterm labour from ICU to antenatal unit will promote quality care to high-risk

pregnant woman with preterm labour and preterm neonates (WHO, 2007).

Another challenge concerning communication was that most midwives were not able to locate where the files for protocols or guidelines were. Some would not even know the maternal guidelines which is the national protocol for all obstetric units of South Africa. Some were not able to remember the colour of the book whilst others were still using the old (2007) edition. The situation explained above reiterated the quality care provision in the obstetric units of Limpopo Province resulting in the increased preterm labour and births.

Participants direct quotations or excerpts:

❖ Midwife 15 from Capricorn district:

In neonatal ward I don't have the guidelines, the ones that I saw sometimes here it was old and it was the policy for referral to other hospitals, KMC, and the other one was for limitation of visitors, now I cannot locate them.

In support of the participants, in South Africa there are guidelines on caring for the sick and small newborns in hospitals. This was the training modules and chart books on newborn care developed by the Limpopo Initiative for Newborn Care (LINC), University of Limpopo and Department of Health, Limpopo Province. The guidelines were not found in the unit due to misfiling and many others (DOH, 2003). Graham, Beardall, Carter, Tetroe & Davies (2003) argued that Canada was good in developing guidelines in patient care but neglected the issue of dissemination and proper filing as well as proper evaluation of guidelines effectiveness, this led to continuing substandard care and less improvement in patient care (Graham *et al.*, 2003).

4.5.2.4 Sub-Theme 2.4: Cultural Beliefs and Practices of Pregnant Women in Rural Areas of Limpopo Province

Participants indicated that it was difficult to provide quality care because some patients were not coming to the antenatal clinic before 12 weeks. If the mother booked before

12 weeks gestation it gives time to midwives to identify women at risk of preterm labour and birth and plan their management appropriately. Those who delayed to book were those patients who believed that you are not supposed to speak out of your pregnancy in fear of being bewitched. Some mothers believed in using traditional medicine (*muti*) from the day they missed their period to protect themselves and the baby. The traditional herbs can stimulate labour at any gestational age, in this case preterm labour and birth. Some will use these medicines to induce labour before coming to the clinic; because they do not know the correct timing they can induce preterm labour and birth.

Participants direct quotations or excerpts:

❖ Midwife 8 from Sekhukhune district:

Also, other challenge is that most of the women here they practice cultural beliefs that are using herbal in order to speed up their labour.

The other thing is that some of them they use herbs the moment they discovered that they have missed the period to protect themselves from witchcraft, and this predispose them to preterm labour.

Similarly, a study done in Kenya revealed that herbal use in pregnant women resulted in multiple adverse outcomes, including discourages and preterm birth. This was found to be a challenge in most countries with low socioeconomic status who used herbs as remedy during pregnancy (Kaburi *et al.*, 2015). The findings corroborated the Italian and Chinese studies which revealed that women who reported preterm labour used traditional herbs as remedies (Kaburi *et al.*, 2015).

In support of the above, a study in Malawi showed that there was a challenge of poor maternal outcomes due to the cultural and customary practices of both the patients and the TBAs. The TBAs were using dangerous amounts of traditional herbal oxytocin to hasten labour, and hence maternal deaths and or perinatal deaths (Beltman, *et al.*,

2013). Some participants indicated further that pregnant women from other communities associated Caesarean section births with misfortune that may need attention in future pregnancies. This myth made the women not to book ANC and some used *muti* to reverse the situation. Some will not book at all and only present with labour pains which may be preterm due to the use of *muti*.

Participants direct quotations or excerpts:

❖ Midwife 9 from Sekhukhune district:

This occurs most of the time when the woman is a previous Caesarean section (C/S) birth and is booked for elective C/S. She took the herbs to induce labour, and another thing is that she took these herbs and stays home and come when she is advanced.

In support of the above, some patients in Malawi used traditional herbs to hasten delivery, fearing Caesarean section delivery. The study indicated that TBAs also encourage them to use herbs and delay to transfer the patient to clinics or hospitals mostly those who were delivered by Caesarean section in their first pregnancy. The practice led to many women having preterm labour and birth which led to increases perinatal morbidity and mortality (Beltman *et al*, 2013).

4.5.2.5 Summary of Theme 2

Participants described several situations that had an impact on provision of quality maternal and neonatal care in obstetric units of Limpopo Province. Shortage of health care professionals, lack of knowledge amongst midwives leading to misinterpretation of guidelines and protocols; provision of low to moderate quality equipment leading to early breakage and malfunctioning and as a result low quality care leading to preterm neonates; improper and dilapidated infrastructure or buildings; absence of staff due to open distance learning; lack and insufficient medical supplies. The existing flaws need to be addressed by the authorities in the obstetric units of Limpopo Province. The

results revealed that 60% of the participants confirmed that there was lack of resources in the obstetric units whilst all 15 participants' interviews in qualitative analysis showed lack of resources as a problem.

4.5.3 Theme 3: Support Needed by Midwives During Provision of Maternal and Neonatal Care to Reduce Preterm Births and Deaths

Suggestions are recommendations or proposals put forward with the aim of bringing effective intervention to a situation. The WHO encouraged evidence-based recommendations on various health-related topics, from preventing and managing specific conditions, improving health, and managing medicines in different settings to providing social care and support to adults and children, safe staffing and planning broader services, and interventions to improve the health of communities. They aim to promote individualized care and integrated care (WHO, 2014). The suggestion proposed are graded according to their strength as strong or weak, the grading is done by the guidelines development group (GDG) who meet on regular bases and discuss the suggestions put forward. The GDG translate the best evidence into best practices (WHO, 2014). WHO (2014) explained the use of evidence from qualitative research to develop guidelines because the qualitative research explores how people perceive and experience the world around them.

Qualitative research use interviews and observations from real and natural settings with less manipulation and control. Evidence from qualitative research can be used to assess the extent to which the potential benefits or harms of an intervention are important to people (the relative importance of the outcomes); the extent to which certain interventions are more or less acceptable to different stakeholders (patients, care givers, health-care providers, etc.); the extent to which different interventions are more or less feasible to implement in different settings, based on people's practical or day-to-day experiences with health-care services; and the potential consequences of different interventions on equity across populations

The National Department of Health in South Africa with the help of researchers outline the guidelines to reduce the preterm labour and birth as suggested by medical practitioners, for example Dr F. Pattinson. The guidelines also suggested the formation of the National Perinatal Morbidity and Mortality Committee (NPMMC) working on specific interventions to reduce occurrences of preterm births and deaths (NPMMC, 2008-2010). Several guidelines were developed, including the *Handbook for Antenatal Care, Guidelines for Maternity Care, Saving Mothers and Saving Babies Report* and recommendations, *Integrated Management of Pregnancy and Child Birth* (IMPAC), PMTCT, perinatal education programs and so on.

The guidelines were to assist the midwives in the obstetric units to provide quality evidence-based care that reduces preterm births and deaths in the obstetric units (Mhlanga, 2008). In this study, the researcher got the suggestions from midwives and managers through qualitative enquiry, during the one-to-one interviews, participants brought to light several important recommendations that were deemed necessary to improve quality of care that would reduce preterm births and deaths in the obstetric units of Limpopo Province.

The recommendations came from the 15 interviews conducted with these groups of participants. Suggestions included addition of staff, resources and equipment. The in-service training, timeous staff development, good communication, emotional support programs, specific guidelines and involvement of school boys and girls in preconception care was some of the factors that can improve quality maternal and neonatal care in obstetric units of Limpopo Province.

The results supported the suggestion because over 60% of participants disagreed that there were enough resources available to assist midwives in their role to reduce preterm births and deaths in the obstetric units of Limpopo Province. To give a more clearer picture, 25% agree to item 4, implying a shortage of staff, 34% agreed to item

2, indicating lack of equipment and 38% agreed to item 3, implying that too few doctors were available to assist the midwives during maternal and child care. Consequently, the researcher outlined the emerged sub-themes below:

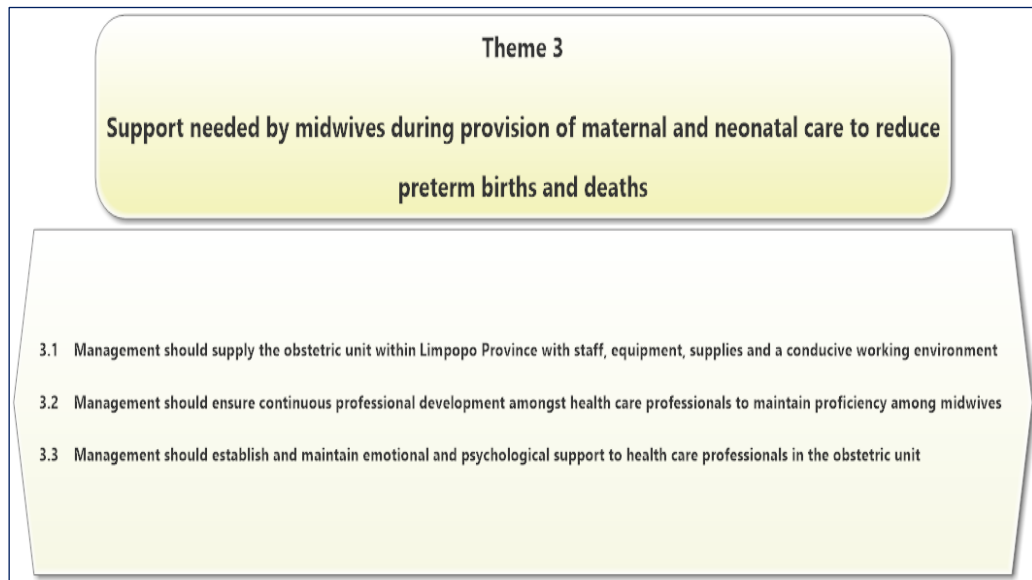


Figure 4.6: Sub-themes from theme 3

4.5.3.1 Sub-Theme 3.1. Management Should Supply the Obstetric Unit with Staff, Equipment, Supplies and a Conducive Working Environment

Participants indicated that it was difficult to provide quality care that would reduce preterm births and deaths in the obstetric units of Limpopo Province. This was because there was shortage of health care professionals (midwives, advanced midwives, neonatal nurses and doctors). Furthermore, there was a shortage of equipment, aggravated by old and dilapidated buildings as well as shortage of materials, medicines and supplies.

Midwives, therefore, suggested that there was a need for replacing deceased staff and those who went for pension. They further suggested that for them to provide quality care that would reduce the burden of preterm labour, births and deaths, the top managers needed to budget for more midwives and doctors in the district hospitals

with obstetric units. The district hospitals are where most pregnant women with preterm labour and births were received before they were transferred to level 2 hospitals.

The increased staff, equipment and supplies will boost coverage of this high-risk group of pregnant women and reduce the occurrence of preterm births and deaths. Similarly, WHO advocated for increased numbers of labour force in health sectors, including maternity sections. These would be achieved if managers budgeted for incentives and provision of descent working conditions to attract and sustain them in the units (WHO, 2016).

Participants direct quotations or excerpts:

❖ **Midwife 3 from Vhembe district:**

Yes, I think our managers also need to replace the person if for example somebody dies, transferred to another hospital, if somebody resigned they are supposed to be replaced.

Similarly, a study in England indicated that increased workforce in maternal care had a positive influence in the care of pregnant women. The study also revealed that one-to-one maternal care to women at risk of preterm labour and births may yield good results and can play a vital role to lift the standard of care of this group of pregnant women and their babies, and hence will reduce both maternal and perinatal morbidity and mortality (Ball & Washbrook, 2010).

Participants also indicated that the few available staff faced challenges to provide quality care due to lack of skills and required competencies. Lack of skills was associated with limited in-service training and training on speciality skills. Speciality skills referred to were advanced midwifery and neonatology, peadiatrics and neonatal nursing.

Participants direct quotations or excerpts:

❖ **Midwife 1 from Vhembe district:**

Jaa, for the support “eeh” I can say the trainings for the development of skills in nurses, because nurses need to be regular in serviced, jaa sometimes when they are familiar to things they do relax so they need in-service training to revive them.

In support of the excerpts, the WHO in their document *Strengthening Midwife Competency* indicated that the impact of skilled attendants is enhanced when they are properly educated, have the necessary equipment and supplies and work within a health system and policy framework that fosters and enables critical thinking and clinical proficiency. They further emphasized a well-trained midwife who also has continuous in-service support training will improve the care of at risk pregnant women and notates, in this case prevent preterm labour and births (WHO, 2011).

Most managers in the obstetric units requested for procuring and buying of quality equipment to avoid breakage and damage within a short space of time. Quality equipment was another solution towards lifting the standard of preterm care and reduction of preterm births and deaths in the obstetric units of Limpopo Province.

Participants direct quotations or excerpts:

❖ **Manager from Sekhukhune district:**

Is a challenge, the challenge is the finance, Jaa I always use to motivate for more nice equipment's because I am smart also I want to be smart, so but we have got a challenge like for the CTG, one was bought by the province, but we have challenge for servicing and repair of the equipment's because they were broken. Jaa, here locally they are trying but the budget is not enough.

A study in Ghana demonstrated that the country's health care facilities failed to provide essential newborn health care and to manage very low birth weights due to lack of

quality material and resources. The recommendation made was to address the issue of shortage of and getting equipment of reasonable quality and lifespan in order to improve their potential to save the lives of very low birth weight neonates (Vesel *et al.*, 2013).

4.5.3.2 Sub-Theme 3.2: Management should Ensure Continuous Professional Development Amongst Health Care Professionals to Maintain Proficiency Among Midwives

Participants deemed it necessary and important to be provided with regular in-service training that would update them and introduce new guidelines for effectivity and quality of midwifery care. This suggestion was made because some of the midwives were working with reference to the old guidelines without updated knowledge, and this was also a challenge to some of the midwives. In-service continuous professional development was seen as a vehicle for dissemination of evidence-based, new researched up-to-date knowledge. New knowledge was vital in provision of quality care that would reduce the occurrences of preterm births and deaths in obstetric units of Limpopo Province.

Participants direct quotations or excerpts:

❖ **Manager from Sekhukhune:**

Jaa, for the support “eeh” I can say the trainings for the development of skills in nurses, because nurses need to be regular in serviced, jaa sometimes when they are familiar to things they do relax so they need in-service training to revive them.

In a study titled the exploration of in-service training needs of psychiatric nurses, recommendation was made to have established ongoing in-service training because it had several advantages to nurses and midwives. It improves their skills, keep them abreast of new changes and provide them with evidence-based quality care skills. All obstacles hindering the in-service need to be addressed and planning need to be

improved for the in-service to continue smoothly. Continued in-service training assisted midwives to provide quality care preterm neonates and subsequently saved them from illnesses and death (Letlape *et al.*, 2014).

Participants direct quotations or excerpts:

❖ Midwife 3 from Vhembe district:

We need training, ja, updates I think will help us because most of us is not that we are negligent or what, is just that we have the insight if we can get frequent updates that will help, workshops also.

In support of the participant quotation, the study on effective in-service training design and delivery: evidence from an integrative literature review indicated that in-service training is an investment in the health fraternity. Regrettably, despite major investments, there is limited evidence about the effectiveness of the techniques commonly applied across countries, regardless of level of resource. Most facilities neglect the in-service training, hence poor service delivery (Bluestone *et al.*, 2013).

Participants accentuated the need to identify the competency and skill as well as willingness of a midwife and send him/her to train timeously and not wait for the line or que or seniority. This will make it possible to send midwives with interest to such fields of speciality, and hence yield more profit to the institution people with a passion will be selected to go for such speciality training, unlike sending a person because s/he is due and had no passion. Sending a willing midwife was viewed as an important tool to send young midwives to train; these young midwives will have a longer service before they could retire, hence they will be a benefit to the province

Participants direct quotations or excerpts:

❖ Midwife 2 from Vhembe district:

Yes shortages of nurses is another challenge, this also pose a challenge to study leaves, we take a long time to go to post basic training, then after

some years you find that now I am 53 years of age or 52 or 53 years then go to training at this age even if I had worked long time in maternity, in class they need more and I am now too old to give more. At this age at home I have some problems; you see I could not manage to concentrate. But then if they take young people immediately after they have passed that will be better.

A study in Malawi titled *The Use of Speciality Training to Retain Doctors in Malawi: A Discrete Choice Experiment*, indicated that training of speciality to retain doctors in rural areas proved to be not correct. The correct tool was to train those doctors with clear preference to work in such areas, irrespective of whether they are still junior doctors from medical school. The results suggested that investment would be made if they scale up training of those doctors with more preference to work in rural areas, regardless of seniority. The training will increase the pool of skilled professionals, hence reducing preterm births and deaths (Mandeville *et al.*, 2016).

4.5.3.3 Sub-Theme 3.3: Management Should Establish and Maintain Emotional and Psychological Support to Health Care Professionals in the Obstetric Unit

Both midwives and managers realized a need to have a wellness clinic within the institutions that solemnly counsel and motivate the midwives who became emotionally affected while providing care. This would uplift the midwives' morale and invigorate them to provide quality and effective maternal and neonatal care, hence reduction of preterm births and deaths in Limpopo Province.

Participants direct quotations or excerpts:

❖ **Midwife 1 from Vhembe district:**

Sometimes the mother has still birth or Fresh still born, they need to refer us to the psychologist so that what is traumatizing us is relieved because when we come here to work every day we need all the mothers to go with a live baby. Currently no any counselling to us.

In support of the quotation, Table 4.6 shows that only 18.1% of the participants agreed that all midwives received counselling after experiencing a difficult situation in the unit whilst 81.9% disagreed with the statement. The debriefing sessions had been implemented in one of district hospitals in Kenya, Nairobi, and had proven to be a feasible intervention to support health providers. Psychological debriefing improves staff's wellness and thus contributes to individual and team performance. It can easily be adapted and replicated within the existing health structures with minimal resources (USAIDS, 2015).

Participants direct quotations or excerpts:

❖ Midwife 2 from Vhembe district:

Yes, very much counselling is needed just because we are having a lot of problems, we are parents at home we have some, here at work we have some problems you see that is why you find that we are not doing well to care for the patients, patients did not receive quality care because we are having problems.

A study on sources of work-related stress and their effects on burnout in midwifery supported the quotation by indicating that midwives at work had other stressors besides those from their work environment. The stressors from family and social life also had an impact in their provision of care leading to negative influences on the outcome of the patient. The negative outcomes also led to midwives becoming burnt out and unable to provide lifesaving care in this case saving of the preterm neonates (Banovcinova & Baskova, 2014).

Some midwives emphasized the need for top managers to come down to them, assess their situation and give them comments, both negative and positive. The unit managers need to listen to them and give them a shoulder to lean on, and again managers need to establish and maintain healthy manager-employee communication. This was suggested because many managers were not supportive to the midwives.

Supportive supervision was believed to bring about maximum support to the midwives who were overwhelmed by several issues like shortage of staff and equipment as well as challenges of working independently. Midwives believed that if managers were acting as a dashboard to which they can vent their challenges it was going to benefit pregnant women with preterm labour/birth as well as preterm neonatal care.

Participants direct quotations or excerpts:

❖ Midwife 5 from Vhembe district:

Yes, support is needed for instance the matron need to come and see our challenges, just to talk to us and provide us with necessary materials and equipment just now we do not have weighing scale to weigh this baby every morning, so they must come for support to see if we are well. Because you can't work here in the ward if you are not well or if you are sick. We need support so that we can also show love to this baby because even if we are educated we can't do it without love and support and understanding, yes is needed.

Table 4.6 shows that only 40.8% of the participants agreed that all units have a mentor available for 24 hours, whilst 59.2% disagreed with the statement.

❖ Midwife 1 from Vhembe district:

Mmm. Form of support I think more staff is needed especially in this hospital of ours, they need to provide us with more staff and equipment's thereof. And even 'ooh!' we get burn out so if at least they could help us with debriefings you know the counselling and especially when we lose those babies that we are trying to protect it becomes difficult, so if they could help us with that it would be good.

Table 4.6 also shows that on average 55.9% of the participants disagreed that midwives had effective support while providing maternal and neonatal care whilst 44.1% agreed with the fact that midwives received effective support.

One manager in the business sector in his article suggested that empowering and equipping multiple internal champions with tools, resources and interpersonal support is a key part of sustaining change. In the case of midwifery practice, midwives are champions in providing maternal and child care of low risk women. If they are well equipped they would manage to reduce preterm births and deaths in Limpopo Province (Swinscoe, 2016)

4.6 Summary of Results from Quantitative and Qualitative Approaches

Both the quantitative and qualitative results revealed that there was inadequate and substandard maternal and neonatal care in most obstetric units of Limpopo Province leading to increased occurrences of preterm births and deaths (Figure 4.7).

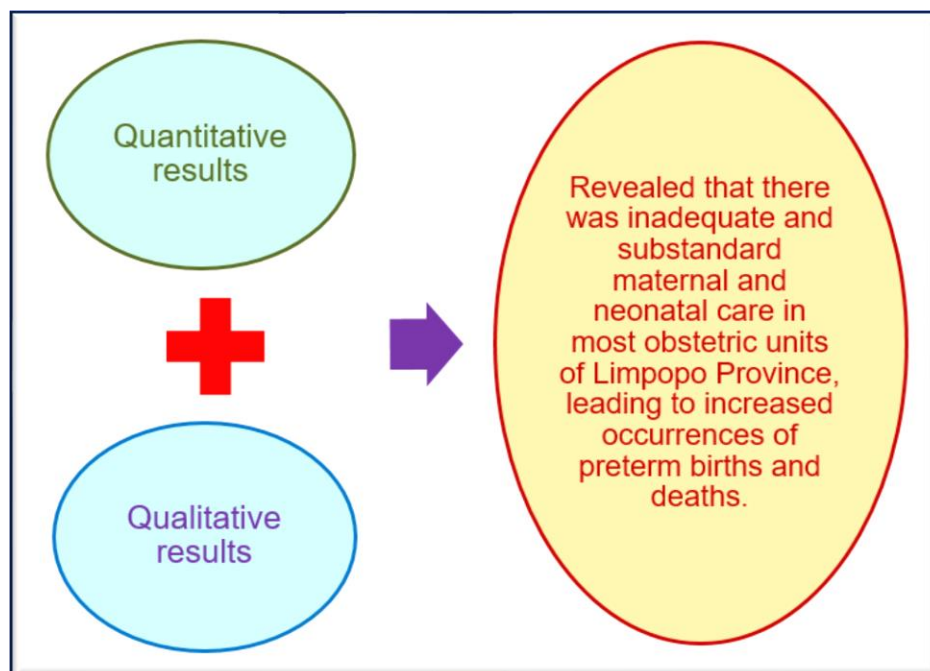


Figure 4.7: Summary of results from quantitative and qualitative approaches

Midwives had knowledge and understanding of their role to reduce preterm births and deaths. There were still serious challenges hampering the midwives to execute their role properly to reduce preterm births and deaths in Limpopo Province. The first theme

outlined the role of midwives in reduction of preterm births and deaths in obstetric units and had five sub-themes, thus: the description of steps taken during the assessment of women during pregnancy, in labour and postnatal period; the precautions aimed at reducing preterm births and deaths were described; the explanations related to use of the existing guidelines for the management of women at risk preterm delivery in order to reduce preterm births and deaths were describe.

The midwives also raised concern wherein they were worried of filling and dissemination of the available guidelines as well as lack of specific guidelines directed to specific conditions like preterm labour and birth. Explanation regarding the existing multidisciplinary team effort geared towards proper management and provision of quality care to preterm babies was made. Description of health education content provided to women during ANC, in labour and postnatal period. Existence of referral system used which is guided by women and or preterm infants' condition was described as the one which was unfavourable and led to mismanagement of preterm labour and births.

The second theme was that of challenges faced by midwives whilst executing their role during preconception, antenatal, labour and puerperium period having four sub-themes. Shortage of health care professionals in the obstetric units of Limpopo Province. The shortage included amongst others lack health care professionals with advanced skills for instance advanced midwives, paediatric and neonatal nurses and obstetricians who assist as multidisciplinary team. Lack of resources in the obstetric units of Limpopo Province which included lack of technological machines, medicines and other medical supplies. Existence of communication problems in the obstetric units of Limpopo Province including poor report giving, less ward rounds and peer group teaching. Cultural beliefs and practices of the pregnant women in rural areas of Limpopo Province. This included practices by pregnant women that predisposed them to preterm labour and birth.

The third theme focused on support needed by midwives during provision of maternal and neonatal care to reduce preterm births and deaths. This had four suggested sub-themes management should supply the obstetric unit within Limpopo Province with staff, equipment, supplies and conducive working environment. Management should provide the obstetric unit with specific preconception guidelines to enhance care of women and preterm infants to reduce preterm births and deaths. Management should ensure continuous professional development amongst health care professionals to maintain proficiency among midwives. Management should establish and maintain emotional and psychological support to health care professionals in the obstetric unit.

CHAPTER 5

DEVELOPMENT OF THE GUIDELINES

5.1 Introduction

This chapter covers the development and description of midwifery practice guidelines that will promote the provision of quality care to preterm babies despite the limited resources in the obstetric units of the Limpopo Province. Chapter 4 covered the analysis, presentation and discussion of data from both quantitative and qualitative methodology. Both quantitative and qualitative results revealed that there was inadequate and substandard maternal and neonatal care in most obstetric units of Limpopo Province leading to increased occurrences of preterm births and deaths. The results revealed two main factors associated with the above action. The first factor was challenges faced by midwives whilst executing their role during antenatal, labour and the puerperium period. Four sub-themes emerged, viz., shortage of health care professionals; lack of resources in the obstetric units; existence of communication problems in the obstetric units and cultural beliefs and practices of the pregnant women in rural areas of Limpopo Province.

The second factor was support needed by midwives during provision of maternal and neonatal care to reduce preterm births and deaths. This factor had four suggested sub-themes management should supply the obstetric unit within Limpopo Province with staff, equipment, supplies and conducive working environment. Management should ensure continuous professional development amongst health care professionals to maintain proficiency among midwives. Management should establish and maintain emotional and psychological support to health care professionals in the obstetric unit.

The purpose of this study was to develop midwifery practice guidelines to promote provision of quality care of preterm babies within limited resources in the obstetric units of the Limpopo Province. The researcher, therefore, set out to develop guidelines based on the two main factors which were stumbling blocks to provision of quality care of preterm babies within limited resources in the obstetric units of the Limpopo Province. In this study, the researcher employed the WHO guideline development model (Figure 5.1) which included the patient/problem, intervention, comparative intervention, outcome and study design (PICOS) and the grading of recommendations, assessment, development and evaluation (GRADE) (WHO, 2012). Thus, the WHO guideline development model included the PICOS and the GRADE(WHO, 2014).

5.2 Analyzing the WHO Guideline Development Model

5.2.1 Selecting the Topic

The researcher carefully selected the study topic under the supervision of three experienced researchers with two being National Research Foundation (NRF)-rated researchers. The topic was ***Midwifery Practice Guidelines to Promote Quality Care of Preterm Babies in Resource-Limited Obstetric Units of Limpopo Province.***

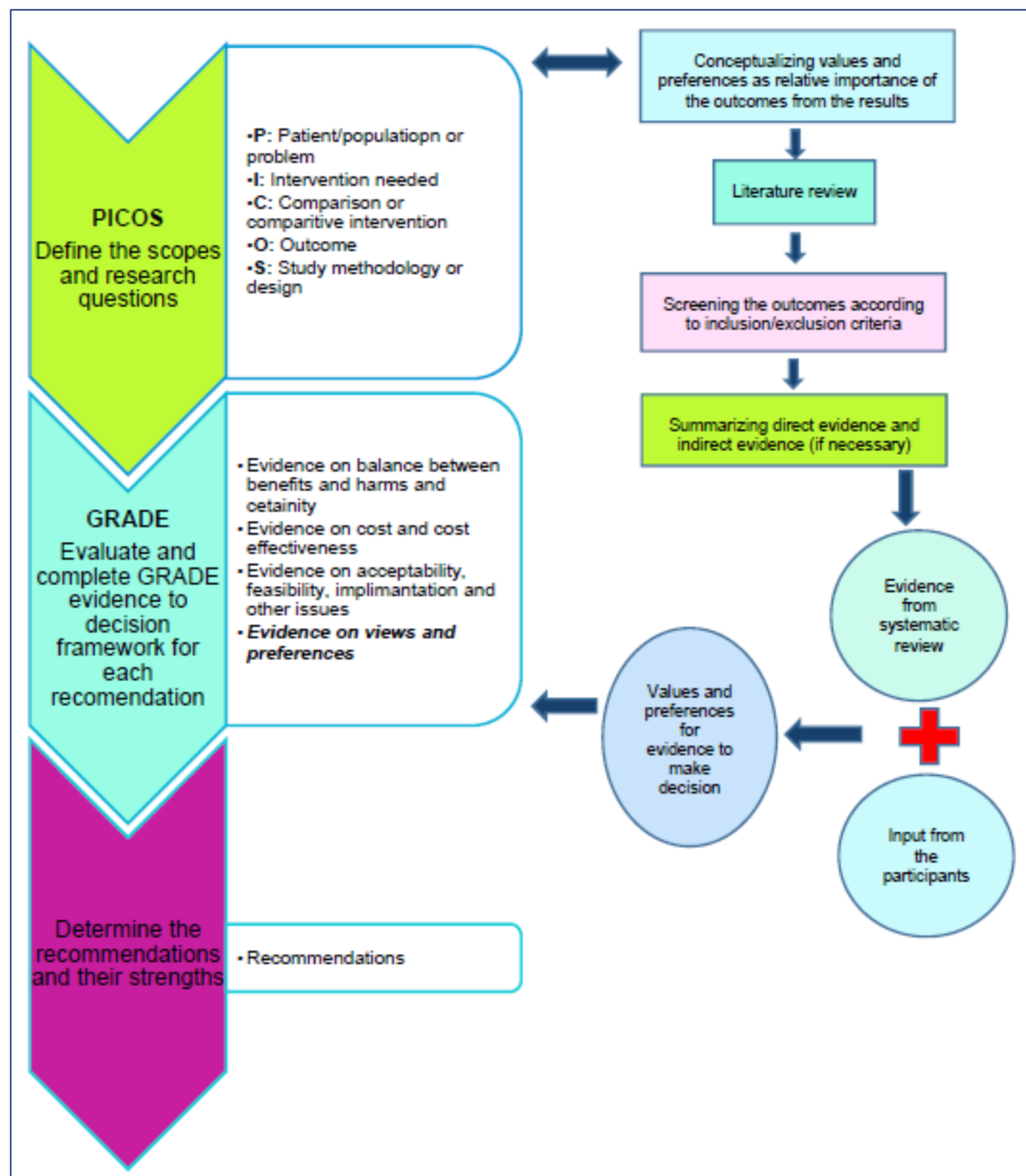
5.2.2 Forming a Guideline Development Group (GDG)

According to WHO (2012), this is a group composed of external experts; it should be small enough, the number need to be between 10-20 to facilitate interaction. This group can meet online through teleconference and may need one face-to-face meeting to consolidate and finalize inputs and recommendations (WHO, 2012). In this study, the expert group included managers and midwives from the Vhembe district obstetric units. The GDG members were drawn from the Vhembe districts. Vhembe district was selected because it has the highest rate of preterm births and deaths. Ten (10) midwives and 3 managers were purposively selected from each district hospital,

viz., Donald Fraser, Elim, Louis Trichardt Memorial, Malamulele, Mussina and Siloam. The 3 supervisors and 1 post-doctoral fellowship student acted as methodological experts.

The steps on the left show the process of integrating values and preferences in guideline development. The guideline panel formulated the recommendations based on evidence on values and preferences, together with evidence from literature, e.g., evidence on the balance between benefits and harms and cost (Zhang *et al.*, 2017).

Figure 5.1: WHO (PICOS and GRADE) model



5.2.3 Scoping of the Guideline

This section addressed the PICOS questions as explained in Chapter 3. The researcher collected and analyzed the data within a 12-month period which was from December 2016 to December 2017. The researcher then engaged the group in answering the PICOS format as outlined in Figure 5.2. The researcher answered the question of study methodology by collecting and analyzing data and gave feedback to the GDG. The GDG and the researcher had the same opinion that there was a problem of increased preterm births and deaths in the Limpopo Province.

The GDG assisted the researcher with the inputs to develop the guidelines (interventions) to reduce the problem. They agreed that despite the available guidelines and SANC rules and regulations, they still faced challenges. They affirmed the findings of the researcher, for example, challenges faced by midwives owing to shortage of staff and equipment in the obstetric units, poor emotional and psychological support of midwives as well as suggested recommendations.

As explained above, the researcher engaged with the group for 12 months through email, this was simple as the researcher is part of a group email that sends weekly updates on the MCWH clinical updates and workshops. The group also advised the researcher to download the Essential Medicine (EML) guideline phone application that release updates on obstetrics and gynaecology. The last question to be answered was searching for evidence from literature to strengthen the inputs of the GDG. Finally, the researcher arranged for a face-to-face meeting with the group to consolidate and finalize the recommendations. The proceedings on the workshop is detailed in Chapter 6.

5.2.4 Developing the Clinical Questions (PICOS)

Figure 5.2 illustrates the PICOS model which is delineated below.

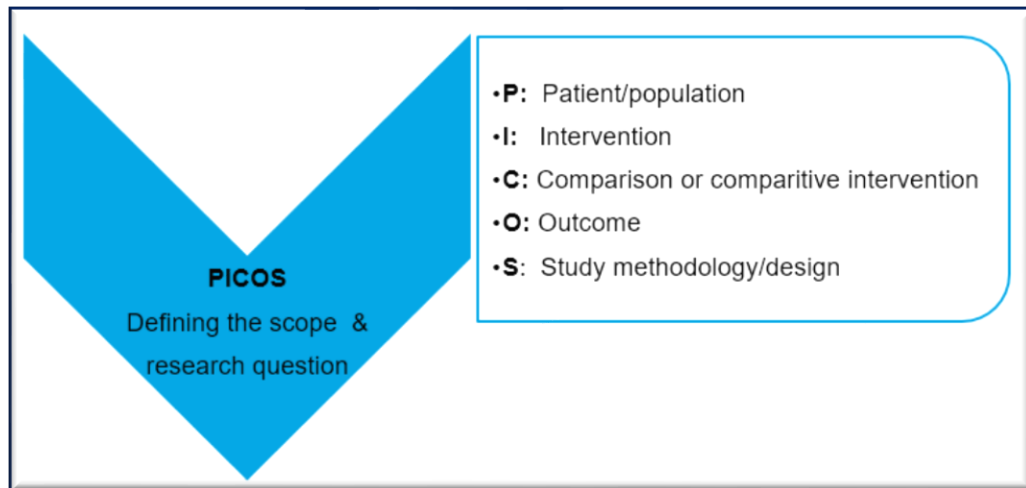


Figure 5.2: The PICOS model

❖ S = Study Methodology or Design

The suitable methodology was the WHO model wherein a guideline development group of 10 members was formed with the purpose of developing midwifery practice guidelines to reduce preterm births and deaths in Limpopo Province.

❖ I = Involvement of the GDG

The researcher communicated with the group through telephones and emails to get their inputs. The process of communicating with the GDG took 12 months. After 12 months of consultation through electronic media, the researcher and supervisors arranged for a meeting to finalize the guidelines. The meeting took the form of a workshop for 2 days. On Day 1, the researcher presented a draft of the recommendations. The researcher divided them into 4 groups comprising of 3 participants each. They were allowed opportunity to engage on the presented draft. The group discussed the draft as a focus group wherein there was a chairperson and a scribe writing the suggested inputs. They were given opportunity to present their

inputs on the presented draft. The group was allowed opportunity to comment and refine the input until they reached a consensus. The consolidated inputs were used in the development of the guidelines. The members who were included in the workshop were acknowledged as they had formed part of the developed guidelines (Annexure10).

❖ P = Identifying the Population

The letter **P** stands for population, problem or patient, the setting and demographic characteristics of the population. In this study, the letter **P** represented the population which comprised the managers and midwives from the district hospitals in Vhembe district this group were the experts in provision of midwifery care. The letter P again represented the available problem which was the increased rate of preterm births and deaths in Limpopo Province. After the analysis of the data in Phase1, the researcher contacted the Vhembe district manager through writing (Annexure 9A) and was given permission to conduct the workshop with the midwives (Annexure 9B). The district manager assigned the maternal, child and women health (MCWH) manager to assist the researcher to recruit the participants. The researcher, with the assistance of the MCWH manager, purposively selected 10 midwives and 3 managers to constitute a total of 13 participants. Their experiences in the field varied from 1 year, 3 years, 5 years and more than 6 years. Their ages were between 20 to 65 years.

❖ I = Intervention

Intervention may include treatment, procedure or the intended intervention. In this study, there was no treatment given, however, the researcher wanted to develop the midwifery practice guidelines to improve the quality of life of preterm babies in Limpopo Province. The experts were involved in the research study to suggest and recommend guidelines specific to midwives and will assist them to render quality care to reduce preterm births and deaths in Limpopo Province.

❖ C = Comparison

Comparison may stand for alternative available options, available standards or best practices. In this study, comparators were basic gold standards being considered included South African Scope of Practice of a midwife and basic conditions under which midwives carry out their care (R. 2598 & R. 2488). The mentioned regulations were used as a framework underpinning the study. Table 5.1 summarizes the guidelines from the framework, and this was detailed in Chapter 2. Thus, Table 5.1 summarizes the basic gold standards laid down by the SANC (Quality Assurance Body) and comparing them with the current situation as depicted by the findings of the study.

Table 5.1: Summary of available basic gold standards

Guidelines from R 2598: Regulation relating to the scope of practice of a person who are registered or enrolled under the nursing act (Chapter 3): <i>During pregnancy, labour and puerperium (SANC, 1984)</i>	Guidelines from R2488: Regulation relating to the scope of practice of a person who are registered, or enrolled midwives may carry on their profession: <i>during pregnancy, labour and puerperium (SANC, 1990)</i>	Challenges faced by midwives whilst executing their role according R2598 & R2488 during antenatal, labour and puerperium (neonatal) period
1. Diagnosis of health need and assisting the woman to achieve good mental and physical health	Preparation of equipment and materials required to execute care	<p><i>Shortage of health care professionals</i></p> <p><i>Lack of resources (equipment, material and medical supplies, old dilapidated infrastructures) resulting into provision of substandard care in the obstetric units</i></p> <p><i>Existence of communication problems that retarded the care in the obstetric units</i></p>
2. Executes treatment programme prescribed by other health professionals	Keep records of all executed regimen	
3. Prevention of diseases, promotion of health and family planning and provide counselling	Promote breastfeeding	
4. Monitoring of progress, vitals, and reaction to course of treatment	Advice patient to be seen by medical practitioner	
5. Prevention of complications by cutting and suturing episiotomies	Ascertain abnormalities and refer	
6. Administer treatments to the newborn child	Refer all primigravida to medical practitioners	

7. Prescribe, promote and maintain hygiene and comfort	Instruct patient on antenatal/postnatal exercise	<i>Cultural beliefs and practices of the pregnant women</i>
8. Promotion of exercise	If possible, visit the woman at least once	
9. Provision of oxygen	Assist the patient with labour and delivery	
10. Prevent body harm and deformities	Remain with the patient when is in the second stage and not leave until delivery	
11. Facilitate wound healing and promote skin integrity	In case of post-partum haemorrhage and doctor is not available administer not more than 10 units of oxytocin	
12. Provision and maintenance of fluid and electrolytes	Do not do internal vaginal examination in case the woman is bleeding	
13. Provide and maintain good nutrition	May perform episiotomy to prevent complications.	
14. Promote breastfeeding	Attend to mother and child until satisfactory	
15. Promote elimination	Discharge them after is satisfied that both are in good condition	
16. Involvement of family	Teach the mother self-care and that of the baby	
17. Establish and maintain safe environment physical and mentally	Advise the mother to report any deviation on the self or baby to the nearest clinic	
18. Prepare and assist with operative and assistance delivery	Maintain good nutrition and hydration	
19. Refer the mother and baby to other categories of health	Provide premixed gas including oxygen	
20. Provide effective advocacy	Prevent complications	
21. Care of dying and deceased patients	Assess and identify abnormalities from the baby and refer if possible	

From the given summary, the gold standards lacked specific guidelines dealing specifically with the preconception care, all guidelines addressed pregnancy labour and puerperium. From the literature reviewed, guidelines on maternal and neonatal

care are available (Chapter 2). There were few guidelines on staffing norms in general, but not specific to obstetric units. No specific guidelines were found in South Africa nor Limpopo Province that specifically direct how to support the midwives emotionally. The gap identified, together with the outcomes from the research findings, were used to develop the guidelines to promote quality care of preterm neonates in the obstetric units of Limpopo Province. The developed guidelines will be validated as a postdoctoral study and will then be implemented in the Limpopo Province.

❖ O = Outcome

Outcomes may mean health outcomes, what it will achieve and what harm or cost will it bring. The outcomes in this study will be the product of the care after implementation of the developed guidelines. Then the outcomes will be compared to see its benefits, potential harm and financial cost incurred during the process of implementing the guidelines.

5.2.5 Evaluating and Completing the Evidence to Decision Framework for Each Recommendation (GRADE)

Figure 5.3 depicts the GRADE model.

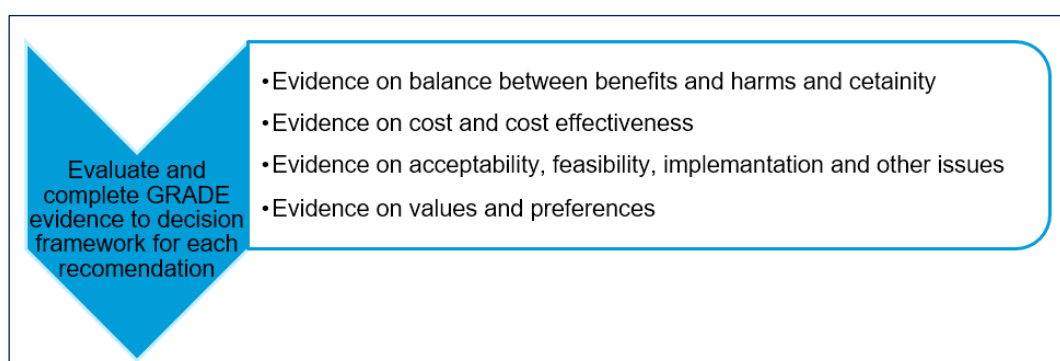


Figure 5.3: The GRADE model

The PICOS (Figure 5.2) model was used as described in above. A comprehensive literature review was conducted (Chapter 2). The study was supervised by experts in research. Data were collected from experts in the field. The study selection and data extraction were done with the assistance of supervisors and an independent coder was employed to organize and code the data. The PICOS and GRADE model advocates that the researcher needs to ensure that the information used to develop guidelines should be from studies with low risk of bias (Table 5.3). Therefore, the researcher minimized the risk of bias by using triangulation which was ensured through the convergent mixed method in the empirical phase of the study, the use of multiple data sources (midwives and managers), as well as various data collection instruments (one-to-one interview and a Likert scale). Synthesis and the reporting of results was ensured by merging of the results to build up the strength of the evidence (WHO, 2012).

5.2.6 Determining the Recommendations and Their Strengths

According to the WHO, “A recommendation (in a practice guideline) tells the intended end-user of the guideline what s/he can or should do in specific situations to achieve the best health outcomes possible, individually or collectively”. A recommendation does not only depend on the magnitude of an intervention effect but should incorporate other considerations and criteria that determine the direction and strength of a recommendation, such as the importance or weight of the health outcomes. Recommendations are the product of inclusively considering influence by a group of participants in a research study through a structured process.

These participants typically included content experts, researchers and other stakeholders. These different individuals may choose different treatment options when they are presented with the same evidence. When full understanding of the information is ensured, different choices for recommendations are often the result of evidence-based values and preferences (Zhang *et al.* 2017). The employment of the

WHO (PICOS and GRADE, Figures 5.2 and 5.3, respectively) model yielded high-quality results because there was triangulation, multiple data sources (midwives and managers), as well as various data collection instrument (one-to-one interview and Likert scale). The merging of the results also built up the strength of the evidence. The suggestions and recommendations were valuable and were selected to be used in the development of the guidelines.

Figure 5.4 shows the determination of the recommendations strengths.

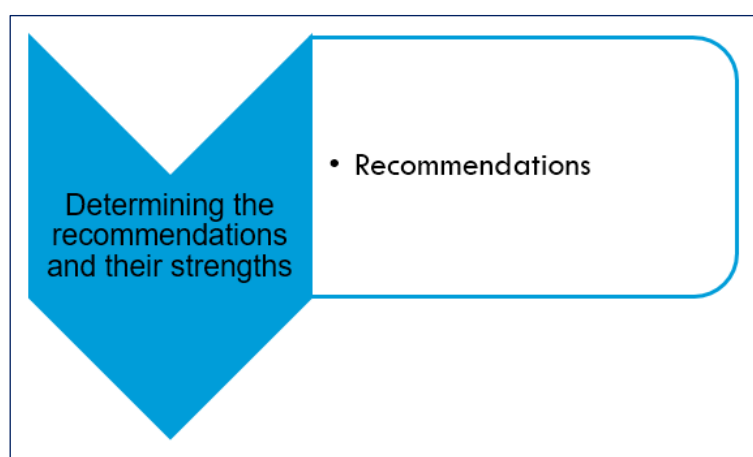


Figure 5.4: Determining the recommendations and their strengths

Both quantitative and qualitative results revealed that there was inadequate and substandard maternal and neonatal care in most obstetric units of Limpopo Province leading to increased occurrences of preterm births and deaths in the province. The participants indicated that the inadequate and substandard care was due to the various challenges faced by midwives whilst executing their roles during preconception, antenatal, labour and puerperium period, having and enlisted the recommendations (Table 5.2).

The recommendations were assessed and graded using the guide as summarized in Table 5.3. The employment of the WHO (PICOS and GRADE) model yielded high-

quality results with limited biases and less serious limitations. Therefore, the researcher and supervisors rated the recommendations as of significance and high quality.

Table 5.2: Recommendations to promote the provision of quality care for preterm babies in the face of limited resources in the obstetric units of the Limpopo Province.

Support needed by midwives during provision of maternal and neonatal care to reduce preterm births and deaths	
1.	Provision of additional healthcare professionals to improve care provided
2.	Supply of quality equipment to be used during provision of care;
3.	Instituting the counselling unit for debriefing sessions with psychologists for healthcare professionals working in the obstetric units;
4.	Establish and maintain in-service education plan to update midwives on new developments related to care of preterm babies;
5.	Promote peer group teaching and the use of teachable moment in the obstetric units;
6.	Request for timeous training for speciality or advanced midwifery and neonatology;
7.	Provision of management support which is anticipated to improve care provided;
8.	Improved filling and dissemination of guidelines.

Table 5.3: Guidance on how to assess recommendations

Guidance to assess study limitations (risk of bias) and corresponding GRADE assessment of quality of evidence				
Risk of bias	Across studies	Interpretation	Considerations	GRADE assessment of study limitations
Low	Information in this study was from studies at low risk of bias.	Plausible bias unlikely to seriously alter the results.	No apparent limitations.	No serious limitations, do not downgrade
Unclear	Most information is from studies at low or unclear risk of bias.	Plausible bias that raises some doubt about the results.	Potential limitations are unlikely to lower confidence in the estimate of effect.	No serious limitations, do not downgrade
			Potential limitations are	Serious limitations,

			likely to lower confidence in the estimate of effect.	downgrade one level.
High	The proportion of information from studies at high risk of bias is sufficient to affect the interpretation of results.	Plausible bias that seriously weakens confidence in the results.	Crucial limitation for one criterion, or some limitations for multiple criteria, sufficient to lower confidence in the estimate of effect.	Serious limitations, downgrade one level

5.2.7 Writing Up of the Guidelines

From the above findings, the researcher developed guidelines based on the participants' recommendations, inputs from the focus groups and literature reviewed as shown in Table 5.4. Recommendations 1 through 9 are summarized in Tables 5.5 through 5.12. The findings revealed that there was substandard care in the obstetric units within the district hospitals of Limpopo Province. The substandard care was due to facts included in the guidelines above. Therefore, the recommendations and guidelines outlined above were developed to promote the provision of quality care for preterm babies in the face of limited resources in the obstetric units of the Limpopo Province.

Table 5.4: Scope, purpose and stakeholders

Title of the guidelines:	Midwifery practice guidelines that will promote the provision of quality care to preterm babies despite the limited resources, Limpopo Province.
Principal authors	PhD Candidate: Mrs Malwela T Promoter: Prof Maputle MS Co-Promoter: Prof Khoza LB Co-Promoter: Dr Ramakuela TJ Post-Doctoral fellow: Dr Anokwuru RJ
Guideline development group (GDG)	<p>Managers</p> <ol style="list-style-type: none"> 1. Mr Sikhipha RM: Assistant Director Maternal Health Vhembe district 2. Mrs. Mashabane LJ: Assistant Director Child Health Vhembe district 3. Mrs. Mabirimisa MA Manager Louis Trichardt Memorial hospital <p>Midwives</p> <ol style="list-style-type: none"> 1. Mlangeni ZM midwife from Malamulele hospital 2. Ratshekani MF midwife from Siloam hospital

	<ol style="list-style-type: none"> 3. Budeli FA midwife from Siloam hospital 4. Mabobo MM midwife from Elim hospital 5. Rikhotso TL midwife from Elim hospital 6. Ramaano NA midwife from Donald Fraser hospital 7. Malatjie MM Advanced Midwife Trichardt memorial 8. Mushasha NP midwife from Trichardt memorial hospital 9. Nemavhola ME midwife from Donald Fraser hospital 10. Jele NM midwife from Messina Hospital
Duration	12 months, from December 2016 to December 2017
Purpose of this guidelines	<p>The main purpose is to provide an evidence-based clinical practice guideline (CPG) that is consistent with the midwifery</p> <p>Philosophy and model of care and to encourage interventions that would maximize benefits and minimize harm maternal and child health care in the obstetric units of Limpopo Province</p> <p>This CPG is independent of and not intended to replace the standards of the obstetric units in Limpopo Province</p>
Clinical problem	Increased preterm birth and deaths in Limpopo Province
Care providers	Midwives and managers in obstetric units of Limpopo Province
Consumers	Pregnant women at risk of preterm labour and birth and the preterm babies
Review date	Three (3) years or when there is new study recommendations
Setting for guideline implementation	Obstetric units within the district hospitals of Limpopo Province

Table 5.5: Recommendation 1

Provision of additional healthcare professionals to improve care provided	
Guideline 1	
1.1	Provide enough midwives according to acceptable midwife-patient ration in all obstetric units of Limpopo for example,
1.2	Ensure midwife patient ratio should be 1: 5 for quality care and reduction of complications
1.3	Put a good plan in place for midwife orientation to improve satisfaction and retaining of midwives in the units,
1.4	Improve skill mix, that is provisioning of more midwives with degree or higher level of expertise
1.5	Have proper and good practice to receive and investigate complains
1.6	Protect midwives from whistle blowers and unnecessary lawsuits
1.7	There is a need of non-registered midwives for example staff nurses need to be allocated in obstetric units for support care.

1.8	Allow lead nurses in research to come up with context and help identify the best practice of midwife staffing
1.9	Plan to replace retired, deceases and resigned midwives should be in place and not take more than three months
1.10	Have a good plan for remuneration and incentives to retain midwives in the obstetric units
1.11	Involve midwives in staffing plans to allow midwives to come up with staffing plan suitable for their environment
1.12	Recruitment strategies need to be in place to attract midwives fresh from secondary schools

Table 5.6: Recommendation 2

Supply of quality equipment to be used during provision of care	
Guideline 2	
2.1	Provide enough equipment according to norms and standards prescribed
2.2	The procurement department need procure for quality equipment
2.3	Establish and maintain good maintenance plan which is quick and appropriate for fast repair of broken equipment
2.4	Train all users on the how to operate the machines to avoid breakage or damage
2.5	Keep inventory of all equipment
2.6	Have control book to monitor the use of all equipment

Table 5.7: Recommendation 3

Instituting the counselling unit for debriefing sessions with psychologists for healthcare professionals working in the obstetric units	
Guideline 3	
3.1	Establish and maintain onsite counselling services for midwife staff members
3.2	Outline clearly the process of consultation and ensure confidentiality
3.3	Provide staff with timeous consultation and support to staff experiencing distress and anxiety
3.4	Empower midwives with psychological, emotional and self-management competences
3.5	Provide personal consultation and coaching
3.6	Provide telephone counselling in case the midwife is at home or sick and is away from the facility, free and around 24 hours
3.7	Provide continuity y allowing extra sessions after the first counselling
3.8	Establish and maintain good complaining procedure for midwives.

Table 5.8: Recommendation 4

Establish and maintain in-service education plan to update midwives on new developments related to care of preterm babies	
Guideline 4	
4.1	Provide midwives with data base for researched or evidence-based care on all high risk maternal and child health cases
4.2	Document all areas that need development and follow strictly these areas to develop the midwives
4.3	Include in-service training in the continuous development (CPD) points
4.4	Fast track the implementation of the CPD points in the renewal of licence of practice
4.5	Allow time for personal research or development and provide funding for such development

Table 5.9: Recommendation 5

Promote peer group teaching and the use of teachable moment in the obstetric units	
Guideline 5	
5.1	Revive the time for peer teaching through weekly teaching plans
5.2	Encourage the use of available experts to facilitate formal and informal teaching in the units
5.3	Encourage those experts to develop a lesson plan for 10 minutes teaching
5.4	File the lesson plan for future reference
5.5	Demonstrate the skill periodically to colleagues in the unit
5.6	Allow time for report giving in the unit
5.7.	Reinstate and reinforce ward rounds

Table 5.10: Recommendation 6

Request for timeous training for speciality or advanced midwifery and neonatology	
Guideline 6	
6.1	Train health workers on speciality for example advanced midwifery and neonatology in time
6.2	Send interested person to train on time irrespective of age or avoid lining up for speciality training
6.3	Provide adequate funding for scarce skills and resources in the unit
6.4	Promote lifelong learning that include open distance learning on speciality training
6.5	Allow speciality training from matric level

Table 5.11: Recommendation 7

Provision of management support which is anticipated to improve care provided	
Guideline 7	
7.1	Establish, adhere and maintain good communication channels that embrace people from diverse cultural beliefs in the unit
7.2	Encourage collaboration in problem solving and conflict management and accept changes in the unit
7.3	Models good listening skills and mediation, encourage goal sharing and professional learning
7.4	Apply good facilitation skills and build ownership in the unit
7.5	Develop collective wisdom to create trust and harmony in the unit
7.6	Embrace cultural diversity, and proper addressing of challenges and refrain from discrimination
7.7	Allow staff to file complains confidently and address challenges without favouritism
7.8	Provide the staff with meaningful and constructive feedback
7.9	Advocate for the staff in case of litigations and lawsuits

Table 5.12: Recommendation 8

Improved filling and dissemination of guidelines	
Guideline 8	
8.1	Create and encourage e-filing data base for midwives
8.2	Create mobile application on findings of an ongoing basis in peer-reviewed literature on maternal care and current practice on preterm issues
8.3	In-service, workshop and conferences
8.4	Have a labelled file put in a shelf or cubicle next to nurse's station
8.5	Have posters with short version of guidelines on preterm prevention management on the walls inside the cubicles

5.2.8 Updating and Reviewing of the Guidelines

The researcher specified a date for updating the evidence-based factors underpinning the guideline recommendations. The researcher considered the recommended three-year period from the date of implementation, or the review will be done if new evidence is likely to influence the recommendations is available or new study recommendations

will be formulated.

5.3 Conclusion

This chapter focused on the development of midwifery practice guidelines that would promote the provision of quality care to preterm babies despite the limited resources in the obstetric units of the Limpopo Province. Guidelines were developed using the WHO steps of guidelines development. Chapter 6 will focus on the conclusions, limitations and recommendations of the study.

CHAPTER 6

Validation, Recommendations, Conclusions and Limitations of the Study

6.1 Introduction

The previous chapter outlined the development of guidelines using the study findings (Figure 6.1). In addition, the chapter assessed if the objectives of the study were met, validation was made to check quality and to ensure that the developed guidelines would assist the midwives in Limpopo Province to reduce preterm births and deaths. Recommendations related to midwifery support were made in the following areas: supply with enough staff, equipment, in-service training, specific guidelines on preconception care as well as involvement of school boys and girls in maternal care (antenatal, labour and postnatal). The recommendations also included what managers in the obstetric units, government and policymakers could do to assist midwives reducing the alarming cases of preterm birth and death in Limpopo Province.

6.2 Validation of the Developed Guidelines

6.2.1 Aims and Objectives of Validating the Developed Guidelines

The aim of validation was to collect and evaluate data, from the process design stage, the consistency and quality of the product or outcome of the guidelines. The objectives to validate the guidelines were to: determine the credibility of the guidelines; substantiate the accuracy of the concepts used in the guidelines and examine the suitability of its inclusion in the institutional policies.



Figure 1

Figure 6.1: Summary of the guidelines

6.2.2 Methodology for Validating the Developed Guidelines

The researcher used the non-experimental, intervention validation design as this is commonly used in nursing research (Grove, 2013). After 12 months of consultations with the GDG, searching of evidence or literature, the researcher wrote a letter to the senior manager Vhembe district to request a meeting with the GDG. The manager requested the release of the group from the district hospitals.

On Day 1, the researcher presented the draft to participants. After the presentation, the participants were divided into 4 groups to discuss the presented draft. All 4 subgroups had a leader who presented the outcomes to the other groups. They discussed the outcomes until they reached consensus. At the end of Day 2 they were given the checklist to assess the draft of guidelines presented. This was also part of validating to agree if the draft guidelines were in line with the practice. The detailed analysis is presented below.

6.2.2.1 Data Collection Method

The researcher used a checklist with 6 questions (Table 6.2) as outlined by Chin & Kramer annexure 8 (Chinn & Kramer, 2008). The appraisal of guidelines research & evaluation (AGREE) reporting checklist 2016 (Annexure 8) was also used to assess the quality and applicability of the guidelines ((Brouwers *et al.*, 2016).

6.2.2.2 Data Analysis

Simple descriptive statistics were used where the data were summarized using frequency distributions. Thereafter, the data were arranged systematically from lowest to highest order with the use of percentages. This is simple to follow as it shows the average scores in a distribution as well as the lowest and the highest score (Brink *et al.*, 2006). The mean, the mode and the median was used to express the average scores in a distribution (Brink *et al.*, 2006)

Table 6.2: Validation of the developed midwifery-centred guidelines by midwives

Validation questions	Yes	%	No	%
1. Are the guidelines goals and practice goals congruent?	10	100	0	0
2. Is the intended context of the guidelines congruent with the practice?	10	100	0	0

3. Is there, or might there be similarity between the guidelines and practice variable?	10	100	0	0
4. Are the explanations of the guidelines sufficient to be used as basis for midwifery action?	8	80	2	20
5. Is there research evidence/literature supporting the theory?	10	100	0	0
6. Will the users of these guidelines influence the practical functioning of the midwifery units?	10	100	0	0
n=10				

Table 6.2 revealed that 100% of midwives agreed that the goals of guidelines were congruent with practice goals, i.e., the context of the guidelines were congruent with practice, there were similarities between the guidelines and the practice. The literature was used to support the guidelines and the guidelines would influence the practical functioning of the obstetric units.

About 80% of the participants agreed that the explanation of the guidelines was sufficient to be used as basis for midwifery action whilst only 20% of participants disagreed with the statements. Table 6.3 shows that 66.7% of managers agreed that the goals of guidelines were congruent with practice goals, the context of the guidelines were congruent with practice and the explanation of the guidelines was sufficient to be used as basis for midwifery action.

Table 6.3: Validation of the developed midwifery-centred guidelines by managers

Validation questions	Yes	%	No	%
1. Are the guidelines goals and practice goals congruent?	2	66.7	1	33.3
2. Is the intended context of the guidelines congruent with the practice?	2	66.7	1	33.3
3. Is there, or might there be similarity between the guidelines and practice variable?	3	100	0	0
4. Are the explanations of the guidelines sufficient to be used as basis for midwifery action?	1	33.3	2	66.7

5. Is there research evidence/literature supporting the theory?	3	100	1	0
6. Will the users of these guidelines influence the practical functioning of the midwifery units?	2	66.7	1	33.3
n=3				

About 100% of managers agreed that the literature was used to support the guidelines and that there was similarity between the guidelines and the practice. Only 33.3% of managers agreed that the explanation of the guidelines was sufficient to be used as basis for midwifery action whilst 66.7% of managers disagreed with the statements.

The mean of the midwives' responses was 96.7%, the mode was 100% and the median was 100%. The mean of the managers was 61%, mode 66.7% and the median 66.7%. The findings implied that most of the midwives and managers agreed that the developed guidelines can improve the outcome and promote quality care of the preterm babies in the obstetric units of Limpopo Province.

6.2.3 Overall Assessment of the Guidelines

Table 6.4 indicates that the developed guidelines were expounded comprehensively, target audience and scope of application were specified, background, objectives and patient relent were clearly described, the evidence was systematically searched, and selected evidence were described and information on how to update the guidelines and period was specified. However, some recommendations were ambiguous though evidence was clearly defined, and the guidelines were not based on drug therapy or treatment. The overall score was 6/8 implying that the guidelines may need some modification to become applicable to practice.

Table 6.4: AGREE mini-checklist intended to evaluate the quality of the developed clinical practice guidelines

1. The guidelines had been written in a generally comprehensive manner and its recommendations are easy to follow									
Yes				To some extent				No	
✓									
2. The guidelines target audiences and scope of application were specified.									
Yes				To some extent				No	
✓									
3. The background, objectives and patients for whom the guideline is relevant were clearly described.									
Yes				To some extent				No	
✓									
4. The persons that developed the guidelines were named, and financial independent and any conflict of interest were clearly documented.									
Yes				To some extent				No	
✓									
5. The search for evidence was systematic and the criterion used to select the evidence were described.									
Yes				To some extent				No	
✓									
6. The guidelines recommendations are unambiguous and the evidence they are based on is clearly presented.									
Yes				To some extent				No	
				✓					
7. Different treatment options are presented that take account of potential benefits, side effects and risks.									
Yes				To some extent				No	
				✓					
8. Clear information is provided on how to update the guidelines and for how long this is expected to be.									
Yes				To some extent				No	
✓									
9. Overall quality of the guidelines based on above score.									
Poor	1	2	3	4	5	6✓	7	8	Very good
10. Would you recommend the guidelines to be used in the clinical practice?									
Yes				Yes, with some modification				No	
				✓					
Adapted from: Brouwers MC, Kerkvliet K, Spithoff K, on behalf of the AGREE Next Steps Consortium. The AGREE Reporting Checklist: a tool to improve reporting of clinical practice guidelines. <i>BMJ</i> 2016;352: i1152. doi: 10.1136/bmj. i1152.									

6.3 Consultation of Peer Review

The draft of the developed guidelines was subjected to extensive review by the midwives at Vhembe district prior to widespread dissemination and implementation for comment on the content, validity, clarity and applicability of the guidelines. The midwives appraised the content, validity, clarity and applicability of the guidelines. Feedback from these experts was considered by the guideline development group and necessary changes were made to the document before final publication. The external reviewers were included, i.e., methodological experts, guideline and clinical experts in the topic area this included Prof MS Maputle, Prof LB Khoza, Dr NJ Ramakuela and a post-doctoral fellow, Dr Anokwuru Rafiat.











6.5. Limitations

In this study, transferability and generalizability of research findings to other provinces may be difficult. The researcher conducted the study in Limpopo Province and some provinces may not be experiencing the same constraints of resources. The other limitation was that of the actual available midwives in the facility was not as it was found in the situational analysis due to attrition caused by death, retirement and resignation which made it difficult to get a representative sample. The number of midwives estimated in the 2015 situational analysis was not what the researcher got in the real setting, some midwives went on pension, and some got higher posts some passed on and were not yet replaced making it difficult to get a representative population to generate acceptable data for generalization. Almost 90% of the 12 selected obstetric units had acting managers, the managers' posts were vacant due to attrition like pension, death or resignation making it difficult for the researcher to constitute the representative population. The study was limited to the Limpopo Province and the sample included midwives and managers in the province. Therefore, transferability or generalization of the findings to all nine provinces may be complex. Some midwives refused to participate

in the study, stating issues of payments or incentives.

6.6. Recommendations

6.6.1. Maternal and Child Health (MCWH) Directorate

-  Revise staffing policy and put in place a strong policy that promote safe staffing norms in the obstetric units and implement the WHO staff ratio of 1 midwife: 5 patients.
-  Managers should support the midwife on duty 24 hours by allocating enough staff, equipment, material and supplies as well as a midwife with speciality skills.
-  Cover all obstetric units with medical doctors for 24 hours. There must always be a speciality nurse onsite for 24 hours in all the obstetric units of the district hospitals.
-  Managers in the obstetric units must be hands-on duty, especially when there is shortage.
-  Purchase high quality equipment and proper maintenance schedules. Managers should consult with the end-users before purchasing the equipment and make sure the suppliers demonstrate how to operate the equipment before its purchase.
-  Replace the staff gone on pension and the deceased on time.
-  Establish and sustain a counselling centre for midwives affected with stressful situations.
-  Establish maternity obstetric units to relieve referrals to the district hospitals.
-  Timeous and efficient training of midwives, preferably train the young midwife who will serve the department for long time before they retire.
-  Train midwives with passion rather than training to increase salary notches. Consider professional interest when allocating the midwives in the units.

- 🔦 Improve filing of guidelines within the units and promote proper communication in the units. Replace managers post as soon as they are vacated and avoid acting posts for more than 3 months.




6.6.2. Midwifery Education and Practice

- 🔦 The training institutions can use the study findings in the enhancement of the midwifery curriculum.
- 🔦 Training of more midwives on maternal and child care. The training selection criteria and training speciality need to be revised considering age and personal interests.
- 🔦 Train the neonatal nurses and station them in a nursery for sick neonates. Allowing open distance learning on advanced or speciality care.
- 🔦 In-service training of nurses allocated to preterm units on care of the preterm babies on regular basis (preterm drills).
- 🔦 Preterm units bed letter audit within 24 hours and use this as teachable moment to assist midwives to identify gaps and improve preterm care.
- 🔦 Always promote peer teaching in the preterm units for all categories of health care professionals.
- 🔦 Career exhibition at schools to assists student to develop passion for nursing and midwifery.

6.6.3. Policymakers




- 🔦 Develop policies that allow midwives in South Africa to practice as certified practitioners with independent responsibility.
- 🔦 Policies that allow the status of a midwife as an independent practitioner, not

dependent on medical practitioners.

-  Policies that facilitate promulgation of implantation of preconception care.
-  Establish and maintain evidence-based data bases for midwives.
-  Involve floor midwives on policymaking decisions.

6.6.4. Further Research

The study revealed that there is substandard care due to shortage of staff, equipment and supplies, lack of specialized skills and little emphasis on preconception care. The researcher therefore recommends studies on:

-  Strategies to improve documentation of patient care in the obstetric units of Limpopo Province
-  Experiences of mothers on the care of neonates in the neonatal units of Limpopo Province
-  Developing the specific guidelines on preconception care.

6.7. Conclusion

The aim and objectives of this study were achieved. The research findings revealed the substandard the management of preterm leading to increased rate of preterm birth and deaths in the Limpopo Province. Recommendations derived from the study findings formed basis to develop the guidelines. The developed guidelines were validated through survey and the results showed that the guidelines are congruent with the practice and can be useful in promoting quality life of preterm babies.

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ANNEXURE 1

ETHICAL CLEARANCE FROM THE UNIVERSITY OF VENDA

RESEARCH AND INNOVATION
OFFICE OF THE DIRECTOR

NAME OF RESEARCHER/INVESTIGATOR:
Mrs T Malwela

Student No:
11626137

PROJECT TITLE: **Developing the midwifery practice guidelines to promote quality care of preterm babies in resource limited obstetric units of Limpopo Province.**

PROJECT NO: SHS/16/PDC/10/1608

SUPERVISORS/ CO-RESEARCHERS/ CO-INVESTIGATORS

NAME	INSTITUTION & DEPARTMENT	ROLE
Prof MS Mapulle	University of Venda	Supervisor
Prof LB Khoza	University of Venda	Co-Supervisor
Dr NJ Ramakuela	University of Venda	Co-Supervisor
Mrs T Malwela	University of Venda	Investigator - Student

ISSUED BY:
UNIVERSITY OF VENDA, RESEARCH ETHICS COMMITTEE

Date Considered: August 2016

Decision by Ethical Clearance Committee Granted

Signature of Chairperson of the Committee: 

Name of the Chairperson of the Committee: Prof. G.E. Ekosse

<p>UNIVERSITY OF VENDA DIRECTOR RESEARCH AND INNOVATION 2016 -08- 16</p>
<p>Private Bag X5050, THOHOYANDOU, 0950, LIMPOPO PROVINCE, SOUTH AFRICA TELEPHONE (015) 962 8504/8313 FAX (015) 962 9060 Thohoyandou 0950</p>



University of Venda

Private Bag X5050, THOHOYANDOU, 0950, LIMPOPO PROVINCE, SOUTH AFRICA
TELEPHONE (015) 962 8504/8313 FAX (015) 962 9060

"A quality driven financially sustainable, rural-based Comprehensive University"

ANNEXURE 2A

REQUEST FOR PERMISSION TO CONDUCT THE STUDY: LETTER TO LIMPOPO PROVINCE DEPARTMENT OF HEALTH

P.O. Box 3179

Sibasa

0970

13 September 2017

The Head of Department (HOD)
Department of Health
Limpopo Province

Dear Sir/Madam

REQUEST FOR PERMISSION TO CONDUCT A STUDY

I am a Doctor of Philosophy (PhD student at the University of Venda in the School of Health Sciences. The topic of my research is: **“Developing the midwifery practice guidelines to promote quality care of preterm babies in resource-limited obstetric units of Limpopo Province”**

I hereby request for permission to conduct a study in your department. The study will be conducted among professional midwives and unit managers. Participation will be voluntary. In-depth one-to-one interviews will be conducted with midwives and managers in the obstetric units to collect qualitative data, and self-administered questionnaires will be administered to collect quantitative data from managers. The purpose of the study will be to develop practice guidelines to promote provision of quality care to preterm babies.

I am hoping that the results of the study will assist in improving quality of lives of preterm babies and help in the reduction of perinatal morbidity and mortality in the Limpopo Province.

Thank you

.....
Mrs. Malwela, T.

ANNEXURE 2B

REQUEST FOR PERMISSION TO CONDUCT THE STUDY: LETTER TO DISTRICT SENIOR MANAGER

P.O. Box 3179
Sibasa
0970
9 October 2017

The District Senior Manager

Dear Sir/Madam

REQUEST FOR PERMISSION TO CONDUCT A STUDY

I am a Doctor of Philosophy student in the Nursing Department at the University of Venda in the School of Health Sciences. My research topic is: **“Developing the midwifery practice guidelines to promote quality care of preterm babies in resource-limited obstetric units of Limpopo Province.”**

I hereby request for permission to conduct a study in your department. The study will be conducted among professional midwives and unit managers. Participation will be voluntary. In-depth one-to-one interviews will be conducted with midwives and managers in the obstetric units to collect qualitative data, and self-administered questionnaires will be administered to collect quantitative data. The purpose of the study will be to develop practice guidelines to promote provision of quality care to preterm babies.

I am hoping that the results of the study will assist in improving the quality of lives of preterm babies and help in the reduction of perinatal morbidity and mortality in the Limpopo Province.

Thank you

.....

Mrs. Malwela T

ANNEXURE 2C

REQUEST FOR PERMISSION TO CONDUCT THE STUDY: LETTER TO CHIEF EXECUTIVE OFFICER

P.O. Box 3179 Sibasa
0970
20 November 2017

The Chief Executive Officer (CEO)

Dear Sir/Madam

REQUEST FOR PERMISSION TO CONDUCT A STUDY

I am a Doctor of Philosophy student in the Nursing Department at the University of Venda in the School of Health Sciences. My research topic is: **“Developing the midwifery practice guidelines to promote quality care of preterm babies in resource-limited obstetric units of Limpopo Province”**

I hereby request for permission to conduct a study in your department. The study will be conducted among professional midwives and unit managers. Participation will be voluntary. In-depth one-to-one interviews will be conducted with midwives and managers in the obstetric units to collect qualitative data, and self-administered questionnaires will be administered to collect quantitative data. The purpose of the study will be to develop practice guidelines to promote provision of quality care to preterm babies.

I am hoping that the results of the study will assist in improving the quality of lives of preterm babies and help in the reduction of perinatal morbidity and mortality in the Limpopo Province.


Thank you

.....

Mrs. Malwela, T.

ANNEXURE 3A

PERMISSION FROM THE LIMPOPO PROVINCE DEPARTMENT OF HEALTH TO CONDUCT THE STUDY



LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH

Enquiries: Latif Shamila (015 293 6650) Ref:4/2/2

Malwela T
University of Venda
Private Bag X505
Thohoyandou
0950


Greetings,

RE: Developing the midwifery practice guidelines to promote quality care of preterm babies in resource limited obstetric units of Limpopo Province

The above matter refers.

1. Permission to conduct the above mentioned study is hereby granted.
2. Kindly be informed that:-
 - Research must be loaded on the NHRD site (<http://nhrd.hst.org.za>) by the researcher.
 - Further arrangement should be made with the targeted institutions, after consultation with the District Executive Manager.
 - In the course of your study there should be no action that disrupts the services.
 - After completion of the study, it is mandatory that the findings should be submitted to the Department to serve as a resource.
 - The researcher should be prepared to assist in the interpretation and implementation of the study recommendation where possible.
 - The above approval is valid for a 3 year period.
 - If the proposal has been amended, a new approval should be sought from the Department of Health.
 - Kindly note, that the Department can withdraw the approval at any time.

Your cooperation will be highly appreciated.



Head of Department 06/10/2016
Date

18 College Street, Polokwane, 0700, Private Bag x9302, POLOLKWANE, 0700
Tel: (015) 293 6000, Fax: (015) 293 6211/20 Website: <http://www.limpopo.gov.za>

The heartland of Southern Africa

ANNEXURE 3B

PERMISSION FROM DEPARTMENT OF HEALTH-CAPRICORN DISTRICT-TO CONDUCT THE STUDY

 **LIMPOPO**
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

**DEPARTMENT OF HEALTH
CAPRICORN DISTRICT**

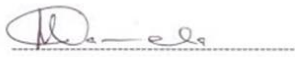
Ref. 6/3/1
Enq: Phosa MM
Tel: (015) 290 9193
Date: 16/01/2017

Ms T Malwela
P. O Box 3179
Sibasa. 0970

**SUBJECT: APPROVAL TO CONDUCT STUDY ON THE DEVELOPMENT OF
MIDWIFERY PRACTICE GUIDELINES IN SOME OF THE HOSPITALS IN
CAPRICORN DISTRICT.**

1. The above matter bears reference.
2. We hereinafter wish to inform you that your application to conduct the above mentioned study in the Department of Health in Capricorn District has been approved by the Head of Department.
3. The Research conditions stipulated in your approval letter should still be adhered to during and after Research study.
4. You are at liberty to approach the four (4) selected hospitals in order to collect the premeditated Research information.


Thank you.


PP DISTRICT EXECUTIVE MANAGER

16/01/2017
DATE

ANNEXURE 3C

PERMISSION FROM DEPARTMENT OF HEALTH-SEKHUKHUNE DISTRICT-TO CONDUCT THE STUDY

**LIMPOPO**
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH
SEKHUKHUNE DISTRICT

Ref : 4/2/2
Enq : Mashiane P.N
Tel : 015 633 2352
E-mail : Philistus.Mashiane@dhsd.limpopo.gov.za

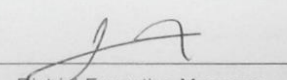
Date : 19 January 2017

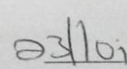
To : Chief Executive Officer:
Dilokong Hospital
St Ritas Hospital
Groblersdal Hospital
Matlala Hospital

FROM: HUMAN RESOURCE UTILIZATION AND CAPACITY DEVELOPMENT

SUBJECT: APPROVAL FOR PERMISSION TO CONDUCT RESEARCH : MALWELA THIVHULAWI

1. The above matter bears reference.
2. The Head of Department has granted approval for Malwela T to conduct research in your institution. Thivhulawi Malwela is a registered student doing Phd at the University of Venda and the title of research is "Developing the midwifery practice guidelines to promote quality care of preterm babies in resource limited obstetric units of Limpopo Province.
3. Take note that the approval will be valid for a 3 year period.
4. The student will present herself, scope and schedule of her work in your institution during the assumption of research conduct.
5. Hope the matter is clear and understandable.



District Executive Manager
Mrs. Maepa M.L


Date

Private Bag X04
Chuenespoort 0745. Tel: 015 633 2300. Fax 015 633 7927. Website:
<http://www.limpopo.gov.za>
The heartland of southern Africa – development is about people

ANNEXURE 3D

PERMISSION FROM DEPARTMENT OF HEALTH-VHEMBE DISTRICT-TO CONDUCT THE STUDY



LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

**DEPARTMENT OF HEALTH
VHEMBE DISTRICT**

REF: S8/4/9

TO: ACTING DIRECTOR PHC: NENGUDZA F.R


FROM: CHIEF DIRECTOR: HEALTH SERVICES

DATE: 03/11/2016

SUBJECT: ACTING CHIEF DIRECTOR: HEALTH SERVICES

.....

1. The above matter has reference
2. Kindly note that you are appointed to act as Chief Director Health Services 03 -04 November 2016
3. During the acting process you are entitled to run the district affairs and you are shouldered with full responsibilities in managing all programs and Hospital Services in the district
4. Hoping you will get the assistance you need for the sake of delivery of health services.



DATE: 2016/11/03

CHIEF DIRECTOR HEALTH SERVICES : HEALTH VHEMBE DISTRICT

Private Bag X5009 THOHOYANDQU 0950
Old Parliamentary Building Tel: (015) 962 1000(Health) (015) 962 4958(Social Dev)
Fax (015) 962 2274/4623.

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LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

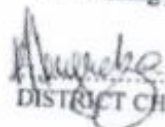
DEPARTMENT OF HEALTH
VHEMBE DISTRICT

Ref: S5/6
Enq: Muvuri MME
Date: 02 October 2016

Dear Sir/Madam

PERMISSION TO CONDUCT A STUDY: MALWELA T

1. The above matter bears reference
2. Your letter received on the 27/10/2016 requesting for permission to conduct a study is hereby acknowledged
3. The District has no objection to your request as the Province has already granted permission through the HOD.
4. Permission is therefore granted for the study to be conducted within Vhembe District.
5. You are however advised to make the necessary arrangements with the facility concerned.
6. Wishing you success in your studies


DISTRICT CHIEF DIRECTOR

03/11/2016
DATE

Private Bag 15009 THOHYANDOU 0950
OLD Parliamentary Building Tel (015) 962 1000 (Health) (015) 962 4958 (Social Dev.) Fax (015) 962 2274/4525
Old Parliamentary Building Tel (015) 962 1848, (015) 962 1852, (015) 962 1754, (015) 962 1001/2/3/4/5/6 Fax (015) 962 2275, (015) 962 227

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ANNEXURE 4A

INFORMATION SHEET

Dear Respondent

I am a Doctor of Philosophy (Health) student at the University of Venda in the School of Health Sciences.

My research topic is: **“Developing the midwifery practice guidelines to promote quality care of preterm babies in resource-limited obstetric units of Limpopo Province”** The purpose of the study will be to develop midwifery-centred guidelines. The study may benefit maternal and child care services in the Limpopo Province by adding new knowledge that may improve service delivery. There will be no financial or any form of reward for participating in the study and there is no financial gain for the researcher. There will be minimal, or no risks expected as there will be no pain infliction or administering of treatment to participants. The time needed for participating may be 30 to 45 minutes only. The interview will be recorded and the answers you provide will not be traced to you, the information will be anonymous. The information will be confidential, only the researcher and supervisors will have access to it. There would be a tape recorder. However, if you are not comfortable with being recorded you can indicate to the researcher, and you will be interviewed without being recorded. The tapes used for recording will be destroyed after the data has been analyzed.

You are not forced to take part in this study; you have the choice to agree or refuse to take part. However, I would appreciate it if you agree to share your thoughts with me. There will be no adverse effect even if you refuse to take part in the study. If you agree to take part in the study and change your mind in the middle of the interview, you will be allowed to withdraw without any penalties.

Your cooperation will be highly appreciated.

Thank you

.....

Mrs. T. Malwela

ANNEXURE 4B

CONSENT FORM

I hereby consent to participate in the study entitled: **“Developing the midwifery practice guidelines to promote quality care of preterm babies in resource-limited obstetric units of Limpopo Province”**

I understand that I can stop this interview at any time should I want to discontinue my participation. My anonymity is guaranteed by the researcher and data will under no circumstances be reported in such a way that it reveals my identity. It was explained to me that the interview will be recorded and that the answers that I will provide will not be linked to my name or used against me and that the information provided by me will remain confidential; only the researcher and supervisors of this research will have access to the information. Once the information has been analyzed it will be destroyed. The condition of the study has been fully explained to me and I fully understand the circumstances of my participation.

Signature of Respondent Date

Signature of Researcher Date

ANNEXURE 5

INTERVIEW GUIDE

Midwives

1. Can you explain what you are doing as midwives (during preconception, antenatal, labour and puerperium) to reduce preterm births and save the lives of preterm babies?
2. Can you outline the resources available in the unit that assist you to save the lives of preterm babies?
3. Can you share the challenges you are facing that affect your role of saving the lives of preterm babies?
4. Can you explain the available policies/guidelines that are guiding you in the neonatal unit and enhance quality of life of preterm babies?
5. Can you suggest any form of support that can assist midwives to save the lives of preterm babies?
6. Do you have any other relevant information on this subject?

ANNEXURE 6

SUMMATED LIKERT SCALE

SECTION A:					
Demographic data:					
<i>Circle your answer</i>					
Age:	20-35	36-45	46-55	56-65	
Position in the unit:	Midwife	Area manager	Unit manager	Neonatal nurse	
Years of experience in maternal and neonatal care:	1 year	3 years	5 years	>6 years	
Using the Likert scale, state the extent to which you agree with the statements given on 4 points scale given. Circle your answer					
	4 Strongly agree	3 Agree	2 Disagree	1 Strongly disagree	
SECTION B					
Antenatal care					
1. All women book before 12 weeks of their gestation.	4	3	2	1	
2. All record and notes of all outpatient pregnant women starting from the first visit until the last visit are kept safe for reference purposes.	4	3	2	1	
3. All pregnant women are done first visit bloods investigations.	4	3	2	1	
4. Midwives make sure that baseline data like vital signs are not missed.	4	3	2	1	
5. Midwives make sure that all results are back and assessed for any abnormalities that need attention by other team members like doctors or dietitian.	4	3	2	1	

6. Midwives refer all women who need attention of doctors or social workers.	4	3	2	1
7. Midwives assess all women for other medical conditions that complicate pregnancies for example:	4	3	2	1
<ul style="list-style-type: none"> Cardiovascular disorders including pregnancy induced hypertension 	4	3	2	1
<ul style="list-style-type: none"> Diabetes mellitus 	4	3	2	1
<ul style="list-style-type: none"> Antepartum haemorrhage like placenta praevia or ablation 	4	3	2	1
8. All women are screened for infections like malaria, HIV and others and are provide treatment when necessary.	4	3	2	1
9. Midwives assess women for high risk factors like previous scar/Caesarean birth or uterine surgery to prevent complications.	4	3	2	1
10. Midwives make sure that all women have a minimum of five visits to the clinic.	4	3	2	1
SECTION C				
Labour care				
1. Midwives take full history during the admission of a woman in labour and record.	4	3	2	1
2. All women with preterm labour are transferred to hospital.	4	3	2	1
3. Midwives provide women with steroids before transferring them to hospitals.	4	3	2	1
4. Midwives assess the cause of preterm labour and give proper management.	4	3	2	1
5. All women with preterm labour are cut episiotomy when assisting preterm labour to avoid brain tissue injuries.	4	3	2	1
6. Midwives prepare the labour room warmly when anticipating preterm birth	4	3	2	1
7. Midwives call for paediatrician when anticipating preterm birth.	4	3	2	1
8. Midwives alert nursery in time when anticipating preterm birth.	4	3	2	1
9. Midwives prepare the resuscitation area well in advance when anticipating preterm birth.	4	3	2	1

10. There is a trained neonatal/paediatric nurse covering all shifts.	4	3	2	1
SECTION D Puerperium				
1. Midwives always maintain all measures to reduce infection in the neonatal unit.	4	3	2	1
2. All midwives in the neonatal unit are trained on the skill helping baby breath (HBB).	4	3	2	1
3. Midwives encourage breastfeeding within the first hour of life.	4	3	2	1
4. Midwives always provide the preterm baby with warm feeds.	4	3	2	1
5. Midwives care for the pressure parts of the preterm baby.	4	3	2	1
6. Midwives change position of preterm babies frequently to prevent skin breakages.	4	3	2	1
7. Midwives provide or arrange counselling to the mothers of preterm babies for emotional and psychological support.	4	3	2	1
8. Midwives always prevent cold stress to all preterm babies.	4	3	2	1
9. Kangaroo mother care is practiced with all preterm babies.	4	3	2	1
10. Midwives prevent brain injuries at all times when handling the preterm baby	4	3	2	1
11. All family members are included in the care of the preterm baby.	4	3	2	1
SECTION E Resources				
1. All units have well explained midwifery-centred policy supporting your care.	4	3	2	1
2. Midwives are always provided with all equipment needed to provide quality care.	4	3	2	1
3. All units have doctor/nurse specialists designated for neonatal unit for 24 hours.	4	3	2	1
4. All units have adequate staff for 24 hours.	4	3	2	1

5. There is a special room for premature babies.	4	3	2	1
SECTION F Effective support				
1. All units have enough midwifery training on the care of preterm babies.	4	3	2	1
2. There is a programme on the in-service or periodic drills on the HBB skill.				
3. All units have a mentor available for 24 hours.	4	3	2	1
4. All midwives receive additional training on the care of preterm babies.	4	3	2	1
5. All midwives receive counselling after experiencing a difficult situation in the unit.	4	3	2	1
6. All midwives have time to conduct research and use evidenced-based care.	4	3	2	1

ANNEXURE 7

TEMPLATE OF A CHECKLIST QUESTIONNAIRE FOR VALIDATION OF DEVELOPED GUIDELINES

VALIDATION OF THE DEVELOPED MIDWIFERY-CENTRED GUIDELINES BY MIDWIVES AND MANAGERS

Validation questions	Yes	No
1. Are the guidelines goals and practice goals in agreement or in harmony?		
2. Is the intended context of the guidelines in agreement or in harmony with the practice?		
3. Is there, or might there be similarity between the guidelines and practice variable?		
4. Are the explanations of the guidelines sufficient to be used as basis for midwifery action?		
5. Is there research evidence/literature supporting the theory?		
6. Will the users of these guidelines influence the practical functioning of the midwifery units?		

Comments

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ANNEXURE 8

MINI-CHECKLIST AGREE REPORTING 2016

Methodological Guideline Quality – Mini-Checklist								
1. The guideline has been written in a generally comprehensible manner and its key recommendations are easy to identify.								
<input type="checkbox"/> YES		<input type="checkbox"/> TO SOME EXTENT		<input type="checkbox"/> NO				
2. The guideline's target audiences and scope of application were specified.								
<input type="checkbox"/> YES		<input type="checkbox"/> TO SOME EXTENT		<input type="checkbox"/> NO				
3. The background, the objectives of the guideline, and the patients for whom the guideline is relevant were clearly described.								
<input type="checkbox"/> YES		<input type="checkbox"/> TO SOME EXTENT		<input type="checkbox"/> NO				
4. The persons that developed the guideline are named, and their financial independence and any conflicts of interest are clearly documented.								
<input type="checkbox"/> YES		<input type="checkbox"/> TO SOME EXTENT		<input type="checkbox"/> NO				
5. The search for evidence was systematic and the criteria used to select evidence were described.								
<input type="checkbox"/> YES		<input type="checkbox"/> TO SOME EXTENT		<input type="checkbox"/> NO				
6. The guideline recommendations are unambiguous and the evidence they are based on is clearly presented.								
<input type="checkbox"/> YES		<input type="checkbox"/> TO SOME EXTENT		<input type="checkbox"/> NO				
7. Different treatment options are presented that take account of potential benefits, side effects and risks.								
<input type="checkbox"/> YES		<input type="checkbox"/> TO SOME EXTENT		<input type="checkbox"/> NO				
8. Clear information is provided on how up-to-date the guideline is and for how long this is expected to be the case.								
<input type="checkbox"/> YES		<input type="checkbox"/> TO SOME EXTENT		<input type="checkbox"/> NO				
Overall assessment of the quality of the guideline based on above results:								
Very poor	1	2	3	4	5	6	7	Very good
Would you recommend others use the guideline?								
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Yes	Yes, with certain reservations	No						

ANNEXURE 9A

LETTER TO REQUEST PERMISSION TO CONDUCT A WORKSHOP



To the District Senior Manager Vhembe district

Dear Sir/Madam

REQUEST FOR PERMISSION TO MEET WITH THE MIDWIVES AND PRESENT RESEARCH FINDINGS OF THE RESEARCH ENTITLED "DEVELOPING THE MIDWIFERY PRACTICE GUIDELINES TO PROMOTE QUALITY CARE OF PRETERM BABIES IN RESOURCE LIMITED OBSTETRIC UNITS OF LIMPOPO PROVINCE"

I am a Doctor of Nursing candidate in the Nursing Department at the University of Venda in the School of Health Sciences. My research topic is: **"Developing the midwifery practice guidelines to promote quality care of preterm babies in resource limited obstetric units of Limpopo Province"**

Thank you for granting me the permission to access the facilities and conduct my study during the period between December 2016 to May 2017. Data had been analyzed and findings revealed some challenges that need to be addressed. The revealed challenges faced by midwives include lack of specific preconception care guidelines, no guidelines on emotional and psychological support of midwives after they had been exposed to stressful situation from home or at work and lack of resources in the obstetric units of Limpopo province which included lack of technological machines, medicines and other medical supplies. The next phase would be to involve the midwives and managers in the development of the guidelines to address the challenges. I am hereby request a permission to meet experienced midwives where I would present the findings and offer them the opportunity to participate as guidelines development group.

The group should consist of 12–15 experienced midwives and managers to attend the session. The selected participants will then give input and suggestions for the guideline development. This will give them opportunity to suggest the feasible, applicable and authentic ideas useful to them, then this will assist them to own the guidelines. The names of those midwives

participated will be acknowledged in the guideline booklet. I further request you to allow me to work with the MCWH program managers to recruit the suitable midwives and managers from labour, postnatal and neonatal units.

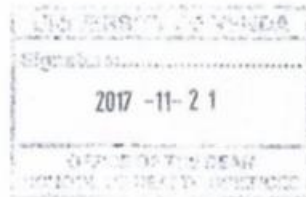
I am hoping that this will assist in improving the quality of lives of preterm babies, and help in the reduction of perinatal morbidity and mortality in the Limpopo Province.

All the supporting documents are attached

Thank you


Student: Mrs. Malwela T Malwela

Supervisor: Prof Maputle MS Maputle



ANNEXURE 9B

PERMISSION TO CONDUCT A WORKSHOP WITH THE MIDWIVES IN VHEMBE DISTRICT



LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

**DEPARTMENT OF HEALTH
VHEMBE DISTRICT**

ENQ : PHAMPHE M. P.
REF : 10/5/2/1.
DATE : 19/01/2018

TO : HOSPITAL CEOs

CC : NURSING SERVICE MANAGER

SUBJECT : REQUEST FOR MIDWIVES TO PARTICIPATE IN THE
DEVELOPMENT OF MIDWIFERY GUIDELINES TO
PROMOTE CARE OF PRETERM BABIES

1. The above matter has reference.
2. With reference to the Limpopo Department of Health's approval of a study by a postgraduate student Malwela T (Ref 4/2/2), kindly take note of this formal invitation of midwives to attend a meeting with the Researcher to review study results and to develop guidelines which aims to promote quality of preterm babies.
3. Activities of the day include that the Researcher will present findings on the study of preterm care in resource limited obstetric units. Midwives will then be facilitated to develop guidelines as informed by the results of the study.
4. Quality of care with the obstetric unit is critical in order to influence morbidity and mortality rates. On this background, midwives are invited to attend the meeting scheduled as follows:

Date: 30- 31 /01/2018
Time: 09h00
Venue: District Boardroom.

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5. Each hospital is requested to release an experienced midwife from Maternity and Neonatal ward (total 2 per facility).

N.B: Refreshments will be provided for the participants'

We are anticipating to meet you as invited.

Regards



Chief Director: Health Services'

19/1/2018


Date

Private Bag x5009, Thohoyandou, 0950
Tel: (015) 962 1000, Direct Line (015) 962 0265. Fax: (015) 962 2373 Website: www.dhsd Limpopo.gov.za

The heartland of Southern Africa - *development is about people*

ANNEXURE 10

WORKSHOP ATTENDANCE REGISTER



University of Venda

Guideline development group Venue: Vhembe District office Boardroom
 Attendance register dates: 30-31 January 2018

Surname and initials	Designation	Contact no.	Hospital	Signature
JELS N.M.	PROFESSIONAL NURSE	0760927753	MESSINA HOSP	
SITHANA R.M	Ass. Director: Maternal	0824006707	District	[Signature]
WASHABANE L.J	Ass. Director Child	0822281484	District	[Signature]
MANGENI Z.M	Professional nurse	0781469249	Malansile	[Signature]
RATHEKARI M.F	Professional Nurse	0782886165	Silomo	[Signature]
BUDELI F.A	Registered Professional	0722155207	Silomo	[Signature]
MABOBO M.M	R.N	0824588611	Elim	[Signature]
RIKHOBO T.C	RPN	0824691100	Elim	[Signature]
REUDIGENO M.A	RPN	0822936574	DFH	[Signature]
NYEMAHOLA M.E	RPN	0822142038	DFH	[Signature]
MOTHE M.M	ADM	0792221166	LTI MEMPH	[Signature]
MUSASA M.P	RPN	071999562	LIT	[Signature]
MABWASA M.A	Professional nurse	0826941983	LIT	[Signature]
JELS N.M.	PROFESSIONAL NURSE	0760927753	MESSINA HOSP	[Signature]
MANGENI Z.M	PROFESSIONAL NURSE	0781469249	Malansile	[Signature]
RATHEKARI M.F	RPN	0782886165	Silomo	[Signature]
BUDELI F.A	RPN	0822281484	District	[Signature]
RATHEKARI M.F	RPN	0782886165	Silomo	[Signature]

Coordinators: [Signature]

Yusufusa MP	RPN	0711449562	0810874
Mdlathe M.M	Adm	0792241646	0810110
Mabantshe M.A	Adm	08234941983	081005241
MABOBO M.M	RPN	0824588611	081005241
RIKHOKO T.L	RPN	0824699110	081005241

Malwela Thirumaw, Imveluma
 Mkhams, Rafiat Ajoka ~~081005241~~ 2018.

ANNEXURE 11

A MIDWIFE TRANSCRIPT

Researcher *Can you explain what you are doing as a midwife to reduce preterm birth and save the lives of preterm babies?*

Participant My part in the ward is when we get patients from home, whereby we try by all means to identify the problem from all patients who are coming through screening them, and then we start using a Partogram in their assessment though some may be left behind but we do try. We try by all means to involve the multidisciplinary team in assessing the patient and helping them. The other thing is mostly advising especially when we are admitting the woman we pass them information about the things following pregnancy that they must have to visit the clinic where they will be taught how to manage their pregnancy.

Another thing that we are doing when we are engaging with the women, when we are attending the women we try by all means to communicate amongst ourselves even giving each other report about the women so that we identify and show each other those who are high risk so that we have the caution from the beginning, conditions such as “vho” hypertension, we try to stress on them, and then in-between ourselves staff we have what we call lectures amongst ourselves about his conditions so that we can be able to identify the risks before they become a problem.

Researcher *Can you outline the resources in the unit that assist you to save the lives of preterm babies?*

Participant We do have the gloves, the (CTGs) we use to have them but now they are damaged no longer working, we only have two that are working but the others are not working. Even those that are working we could not do tracing because they lack tracing papers that we use for non-stress test, it was difficult, but even for detection of foetal distress it was more difficult because we do not have enough CTGs, but the space is not available. We have 6 labour rooms but only two CTGs.

Researcher *Can you share the challenges you are facing that affects your role of saving the lives of preterm babies?*

Participant Mmmmm. With the challenges I can say first with that one of not having enough

staff, no enough resources so that we can help the patients. Another thing 'eh' we are having a challenge of, can I say 'eh' limited skills or human resource as sometimes when we want to report the patient to doctor, the doctor is busy in theatre in that time and then you are having a patient that need 'eh' urgent help and the doctors are faced with too much of a challenge

And another thing I think is communication between the manager and the nurses here at the base communication is mostly not functional because here we have a vacant post of our line manager. When something happens, you find that there is miscommunication because no one is solemnly responsible of taking the issues to higher level managers, somehow, we end up with communication problems.

Mmmm. Also I can say our hospital is having influx of patients because the clinics are not delivering women at all so all the women that are going for ANC in 19 clinics they are all coming to hospital to deliver which in turn it becomes too much of a burden looking at the staff allocated in labour ward because the ratio is too much some patients are not checked as they supposed to be

- Researcher** *Follow up on what you said, what is making this clinic not to conduct deliveries.*
- Participant** Mmmm. They are giving the reason that they are not paid for their call, then another factor that they are giving is that some of the clinics are being renovated so they are no longer working during the night so the challenge that we encounter is that even during the day they don't deliver when the woman reaches 9 month they tell them when you feel go to hospital even those that are reluctant and report labour at the clinic they transfer them to hospital.
- Researcher** *Can you explain the available policies/guidelines that are guiding you in the neonatal unit and enhance quality of life of preterm babies?*
- Participant** 'Eish' is there any available policies let me think I'm not sure.
- Researcher** *Let me assist you, for example maternal guidelines.*
- Participant** Ee (yes) smiling, we do have the maternity guideline, maternal guidelines is the only one that we have.
- Researcher** *Follow up, don't you have some files in the units with revised or specific guidelines.*
- Participant** 'Ja' (yes) there are some files in the unit is just that now I am trying to think of other policies and are not coming.
- Researcher** *Can you suggest any form of support hat can assist midwives to save the lives of preterm babies?*
- Participant** Mmm. Form of support I think more staff is needed especially in this hospital of

ours, they need to provide us with more staff and equipment's thereof. And even 'ooh!' we get burn out so if at least they could help us with debriefings you know the counselling and especially when we lose those babies that we are trying by all means to protect it becomes difficult, so if they could help us with that it would be good. Ooh yes even when I look into the topic I think you are on the right track if they can provide us with the guidelines that that help us to help without the involvement of a doctor because when you look at the staff most is the inclusion of the multidisciplinary which limit the midwife. Where we are working now is difficult, a district hospital has few doctors, right now we don't have the operational manager if hired it will bridge the gap of these miscommunication.

Researcher *Do you have any other relevant information on this subject?*

Participant I think we can stress too much on peer teaching, help each other and then we do it making sure that everyone is covered. Even workshops that are going to update the things we are doing because things are changing, if they involve us in that thing of workshop it can improve the working conditions. The other one that I can stress on is updating of available programs because you find out that current programs are old.

Researcher *Thank you!*

Participant Okay welcomed.

ANNEXURE 12

A MANAGER'S TRANSCRIPT

Researcher *Can you explain what you are doing as a midwife (manager) to reduce preterm birth and save the lives of preterm babies?*

Participant Mmm, okay as a midwife is my role to save the lives of preterm babies, I do this by encouraging early booking by the mothers so that we can identify any complications and we can treat immediately for example STI'S, that can cause preterm labour, now other complications will include HIV because other people can get preterm labour because of HIV-positive status. So you need to identify all those complications, so immediately when you see that these patients have this conditions you need to give the steroids, if labour starts you need to do tocolysis, if the patient is in the clinic they need to give steroids, tocolysis, and refer for high risk clinic or to maternity because sometimes you may find that the labour is advanced but anyway if, if is having repeated preterm, you need to link that mother with the doctor and discuss this so that the future pregnancy is timed/planned. Another thing "eeh", if may be the mother has an incompetent cervix/cervical incompetency they should do the Shirodkar to can prevent preterm labour., and then another thing is the antibiotic in case of infections they should give the antibiotics according to the guidelines, even blood tests can be taken and to identify the infections.

Another thing is the spacing, because if they are not spacing then the uterus cannot be able to hold, and then what else again, I don't know. Again, if we fail to do tocolysis we allow the baby to be delivered but the problem is that here we do not have all the equipment's to save the lives of preterm babies, if the preterm labour is identified early we transfer to level three hospital. Now if it can happen that the mother delivers we can admit the baby in the high risk neonatal care where we put the baby under servo, and the baby will be given the bronchodilators and kept nil for 24hours.

Am I not too fast?

Researcher *No, I am recoding.*

Participant Okay, we also give the baby the antibiotics prophylaxis as it is prone to infections, they must also take even the bassline blood test, and furthermore we give the

newborn routine care. Then we need to check the weight of the baby weekly, and some of the preterm you find that “ba” they have anaemia, of which we check the Hb, each and every week on Wednesdays i.e. every Wednesday. So when they grow may be to 1.2kg or 1kg this shows that the baby is coping well we start KMC skin to skin and then we even start to train them to start self-feeding, we use cup feeding first and then furthermore intermittent breastfeeding and if they cope we put them on breastfeeding and then we even have” eeh” the audit tool for those preterm babies we score them and then see their progress and then continue KMC and then we discharge them according to guidelines. The KMC guidelines usually tells us to discharge them at 1.8kg, then we discharge them home and the doctor will do review may be weekly to check the baby progress, that it.

Researcher *Follow up, what do you do as a midwife do to prevent this? Do not focus on what doctors or machines do.*

Participant Ooh that, we in case of ANC we do assessment and check if the mother is having any existing condition whatever, may be any history of complications like Caesarean section or any other laparotomy done or may be any injuries on pelvis that may have impact on pregnancy and labour, also the basic blood tests in ANC to pick up whatever condition so that we can treat, or whatever condition that predispose to preterm for example excluding anaemia , furthermore you need to adhere to protocols’ e.g. giving of iron supplements , yes and then we encourage them even taking the well-balanced diet , counsel them about STI’S, about them all , also HIV and then they are counselled if they see any alarming signs they need to report to us. And then you palpate them, you determine the gestational age if is doubtful refer.

Researcher *Can you outline the resources in the unit that assist you to save the lives of preterm babies?*

Participant Jaa, the resources that I have, I have 1 neonatal unit, 2 paediatricians, 1 medical officer (MO), I have got 2 interns, I have got 1 neonatal nurse, and then I have got one advanced midwife, in neonatal unit I have got 4 professional nurses, then I have go even 4 enrolled nurses, then I have got 4 ENA’S, and then 80% of them have been trained the management of sick and small babies and then HBB, helping baby breath and some few ESMOE training.

Now with regard to equipment’s I have got 11 servos, I have got 15 pulse oximeters, I have got 10 IVI infusion pumps, some servos have built in phototherapies, and I have got 3 mobile phototherapies, I have got also 3 ventilators, and then 3 NCPAP, I have got ”mmm” okay what we call this what we use to check HB, H metre, and then what we call glucometer, what and what left, I left “mmm” I have got 2 closed incubators I have got 2,4,6 KMC beds.

Admission room

Mmm, we do not have admission room per se, when entering this building there is a big table that you saw coming in here, is our welcoming area where you find a bench and a table. the sisters welcome the patients there and when they entered there are two beds for admission we have got patients dresses, then we have partogram, urinalysis equipment's, they have got only three CTG'S that are functional and also yesterday I have received the infusion pump for the mothers, yes 3 and then data scopes BP'S I have got four some are still gone for repairs.

Medical supplies

Is a challenge, the challenge is the finance, Jaa I always use to motivate for more nice equipment's because I am smart also I want to be smart, so but we have got a challenge like for the CTG, one was bought by the province, but we have challenge for servicing and repair of the equipment's. Jaa, here locally they are trying but the budget is not enough. Another thing is that we are no more using the ambubags we are now using the puffs machines. In labour ward we are running short of servos I need each delivery room to have a servo I don't need the resuscitation to be centralized. The warmth also is a challenge we don't have warmer especially in labour ward but in nursery is okay. In labour ward in case of preterm delivery we need enough warmth. In KMC also no warmers, we need them for augmentation especially during winter.

Researcher *Can you share the challenges you are facing that affects your role of saving the lives of preterm babies?*

Participant Jaa, my first challenge is staff, I don't have enough staff and then the little staff that I have I am not happy about the skills, because you have the patient you need to apply the good quality skills to prevent complications. Now I have got shortage of staff, poor skills, and they are usually absent because they are ill, because they are tired. But now another challenge is because of this changes, now this people don't want to be called the enrolled nurses anymore, they all attend to private education to train to be a registered nurse although is a good thing of course, but now they don't arrange with us, when we want to ask them to work extra mile is then that they tell us they are registered for private studies. I also become a challenge when you want to balance the ward, they are not there they, then sometimes when you arrange the allocation they tell you I am going to school, really is a challenge.

Another challenge is that of servicing equipment's that took a long process because you have to do follow the procurement process and then is really a challenge and we are failing to diagnose patients. The other thing sometimes we run short of stationery, like right now we buy for ourselves we us to pock ourselves and buy for patients sake of which is strenuous to us and is not fair.

Researcher *Can you explain the available policies/guidelines that are guiding you in the neonatal unit and enhance quality of life of preterm babies?*

Participant Jaa, I have got Maternity guidelines which is and overall guidelines. I have got HIV guidelines 2013, I have got the management of small and sick babies' guidelines, blood and blood products guidelines, STI'S, TB, I have got almost all, yes also PCR.

Researcher *Can you tell me if all of you peruse and work according to guidelines?*

Participant Of course, if we do fail, I know our coping mechanism is not the same, when you read you can do best, when I read I don't understand, then I don't do best. But if you manage the patient and you fail you refer.

Researcher *Can you suggest any form of support hat can assist midwives to save the lives of preterm babies?*

Participant Jaa, for the support "eeh" I can say the trainings for the development of skills in nurses, because nurses need to be regular in serviced, jaa sometimes when they are familiar to things they do relax so they need in-service training to revive them.

Psychological

Jaa, we need support visits from the province or wherever, the visit also assists in things that looked good in our eyes and not good to patient anyway they will correct us, they come give us advice, is good, they use to come to audit for example if we had maternal death or whatever.

Researcher *Do you have any other relevant information on this subject?*

Participant We need money we don't have money in Limpopo, money to hire staff train nurses, buy equipment's etc. that's it.

Researcher *Thank you.*

ANNEXURE 13

QUALITATIVE DATA CODING CERTIFICATE

Qualitative data analysis

Doctor of Philosophy in Health Sciences

Malwela T

THIS IS TO CERTIFY THAT:

Prof. Tebogo Maria Mothiba has co-coded the following qualitative data:

Unstructured one-to-one interviews

For the study:

**DEVELOPING THE MIDWIFERY PRACTICE GUIDELINES TO
PROMOTE QUALITY CARE OF PRETERM BABIES IN RESOURCE
LIMITED OBSTETRIC UNITS OF LIMPOPO PROVINCE**

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

Prof TM Mothiba



TM Mothiba (PhD)

ANNEXURE 14

CONFIRMATION BY LANGUAGE EDITOR AND TYPESETTER

ANNEXURE 14

CONFIRMATION BY LANGUAGE EDITOR AND TYPESETTER

Donavon C. Hiss

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14 April 2018

To Whom it May Concern

This serves to confirm that I have edited the language, spelling, grammar and style of the PhD dissertation by **Thivhulawi Malwela**, titled: **Midwifery Practice Guidelines to Promote Quality Care of Preterm Babies in Resource-Limited Obstetric Units of Limpopo Province.**" The manuscript was also professionally typeset by me.

Sincerely Yours



Dip. Freelance Journalism, Dip. Creative Writing, MSc (Medicine), PhD