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CHALLENGES MIDWIVES EXPERIENCE CARING FOR MECHANICALLY VENTILATED WOMEN IN A LABOUR WARD OF A PUBLIC TERTIARY HOSPITAL

BY

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DECLARATION

I, Nwanamidwa Ronewa Alletta, declare that this dissertation, “Challenges midwives experience caring for mechanically ventilated women in a labour ward of a public tertiary hospital”, submitted to the University of Pretoria for the degree M NURS, is my original work in conception and execution, that all references to materials cited or used in this dissertation are complete and cited appropriately, and that I have not previously submitted this work for credit at this university or any other university.

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DEDICATION

This dissertation is dedicated to my mother's uncle who is late, Advocate Mulaudzi Ailweli who taught me to always respect and treat human beings equally irrespective of what they have in life.

The man whom I promise he will accompany me to the second graduation, unfortunately he passed on due to a short illness May 2023.

May his precious soul continue to rest in peace.

To my favourite parents, my dearest mother Nwanamidwa Tshiwela, my best mothers twin Nwanamidwa Tshimangadzo.

Thank you very much for the endless support, you are loved, you are appreciated and you are enough.

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ABSTRACT

Introduction: In South Africa, especially in Gauteng Province, the healthcare system has been increasingly overcrowded by high-risk obstetrician women. These women are being cared for in the labour ward by a limited number of healthcare professionals. There are very few intensive care beds available, leading to women not being transferred to intensive care units after being mechanically ventilated in the labour ward. A standard labour ward must be able to provide short-term mechanical ventilation while awaiting the transfer of the women to a critical care unit. There seems to be a lack of skills among the midwives who take care of these critically ill women who are mechanically ventilated in the labour ward.

Aim: The study explored the challenges midwives experience taking care of mechanically ventilated women in a standard labour ward in Gauteng Province, South Africa.

Methodology: A qualitative research design was used to explore the challenges midwives experience caring for mechanically ventilated women in a standard labour ward at a public hospital in Gauteng province, South Africa. The method of non-probability purposive and convenience sampling aided in obtaining in-depth discussion from the midwives, who were chosen on the basis of their knowledge and experience with the research subject.

Results: The research provided insight into the challenges midwives experience caring for high-risk women who need intensive care. The themes focused on midwives' challenges in caring for mechanically ventilated women. Challenges included midwives' competency challenges, midwives' medical-legal challenges, inter- and intra-professional challenges, and healthcare system-related challenges.

Recommendations: For midwives to render proper nursing care, all midwives who work with mechanically ventilated pregnant women should be trained. Early referrals should be made to higher levels of care, like the intensive care unit, where multidisciplinary levels of staff and treatment are available. Training recommended includes training the midwives about the mechanical ventilator machine settings and caring for pregnant women who are mechanically ventilated.

Keywords: midwives, nursing, mechanically ventilated women, labour ward, and tertiary hospital

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LIST OF ABBREVIATIONS

ABBREVIATION	MEANING
ICU	Intensive Care Unit
CEO	Chief Executive Officer
DoH	Department of Health
MDGs	Millennium Development Goals
MMR	Maternal mortality ratio and the infant mortality ratio
WHO	World Health Organization
IV	Intravenous
HDU	High dependency unit
CVP	Central venous pressure
HELLP	Haemolysis Elevated Liver Enzymes Low Platelet
DIC	Disseminated Intravascular Coagulation
PE	Pulmonary oedema
SDG	Sustainable development goal
EmOC	Emergency obstetric care
CO2	Carbon dioxide
PaCO2	Partial pressure of carbon dioxide
OCCUs	Obstetric critical care units
O2	Oxygen
MAFU	Maternal and Foetal assessment Unit

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CHAPTER 1: ORIENTATION TO THE STUDY

1.1 INTRODUCTION AND BACKGROUND

Mechanical ventilation is an important component of respiratory support therapy in a variety of clinical settings, including for pregnant women who require intensive care during the antepartum, intrapartum and postpartum period in the labour ward. Midwives must understand the physiological and pathophysiological changes in the respiratory system that occur during pregnancy and its complications. Mechanical ventilation expertise is crucial for limiting harm and reducing maternal and neonatal morbidity and mortality (Ernesto et al., 2020:1).

Intensive care unit (ICU) beds are often not available, even in large tertiary hospitals, which may contribute to maternal mortality (Langenegger et al., 2019:132). There are challenges in the provision of maternal critical care in resource-limited settings, including not having enough trained personnel and a lack of supporting infrastructure and equipment (Vasco et al., 2019:90). A study in the United Kingdom found that obstetric high-dependency care provision might be inequitable at the local level (James et al., 2019:2). Safe and equitable obstetric high-dependency care requires organizationally efficient systems. Ernesto et al. (2020:1) emphasize that mechanical ventilation knowledge is critical for limiting damage and reducing maternal and neonatal morbidity and mortality. Proper understanding and implementation of mechanical ventilation strategies are essential to ensuring the safety and health of both the mother and the foetus. This includes determining appropriate ventilator settings, monitoring mother and foetal well-being, and coordinating treatment across a multidisciplinary team to address the particular challenges of pregnancy and labour. By doing so, healthcare providers can optimize outcomes and reduce the risks associated with respiratory support during these critical periods. Obstetric critical care needs a higher level of midwifery care than the normal maternity ward and more hours per woman per day (Critical Care of the Obstetric Patient Policy., 2019:1).

In 2016, a survey conducted by the International Confederation of Midwives (ICM), the World Health Organization, and the White Ribbon Alliance gathered data from midwives in 93 countries. The survey revealed that 68% of the midwives who participated felt overworked because there weren't enough staff (www.who.int, 2016) It is necessary to underline that the working conditions of midwives are rather difficult everywhere in the world. Failure to address the issue will negatively impact recruitment and retention, exacerbating the scarcity of midwives (Carvajal et al., 2023:1).

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Despite international commitment to Sustainable Development Goal 3, Sub-Saharan Africa has a high maternal mortality rate. In Malawi, for example, this is because of infrastructure deficiencies, such as the lack of ICUs to care for critically ill obstetric women (Prin et al., 2019:1). In their study that was done in Cape Town, Vasco et al. (2019:86) suggested that to improve maternal critical care, training programmes should incorporate new techniques and technology that assist in the prediction of critical illness in pregnant women. The goal must be improved outcomes, and this can be achieved through early transfer to an appropriate level of care. Vasco et al. (2019:86) indicated that in high-income countries, the rate of admission to ICUs is below 1% (0.08–0.76%), but in low- and middle-income countries, it ranges from 0.13 percent to 4.6 percent.

According to a study done by Adatara et al. (2021:2), Ghana's maternal mortality rate is very high, with roughly 308 deaths per 100,000 live births in 2017. The study found that midwives face many challenges in providing adequate women-centred care in rural Ghana, and the challenges included inadequate infrastructure (lack of bed and physical space), shortage of midwifery staff, logistical challenges, lack of motivation, and limited in-service training opportunities. Maternal deaths are more common in rural settings due to the larger incidence of competent birth attendants in high-resource settings; they have about 74% of birth attendants compared to resource-limited settings, where they have about 43% of birth attendants (Apanga and Awoonor-Williams, 2018:1).

In South Africa and especially in Gauteng province, the healthcare system has been increasingly overcrowded by obstetrics women (Langenegger et al., 2019:132). When the labour wards are overcrowded, these women are cared for by a limited number of healthcare professionals under chaotic working conditions, and if women complicate and become critically ill, transfer to ICUs for specialized care becomes challenging. Different factors lead to the ventilation of critically ill obstetric women and underlying conditions. Some of the obstetric issues that may lead to women being ventilated are post-partum haemorrhage, which can result in hypovolemic shock; pulmonary oedema, which can be caused by fluid overload; cardiac issues; and pre-eclampsia-related complications leading to organ dysfunction, including acute respiratory distress syndrome, necessitating ventilator support to maintain adequate oxygenation and ventilation (Zhao et al., 2021:5-7).

The researcher, a midwife in the research setting, observed that critically ill obstetric women were often mechanically ventilated in a labour ward where midwives had little or no knowledge of nursing ventilated women and operating a ventilator machine. Staff members caring for critically ill obstetrics women must have specialized knowledge and experience. In Southern

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Africa, women who should be managed in an ICU or high-dependency unit are managed in a general ward (Joynt et al., 2019:53–54). At times, women are ventilated and cared for in a labour ward instead of in an ICU, especially in the public sector (Joynt et al., 2019:53–54).

Scott and Foley (2018:18) define intensive/critical care as "care that must be provided on a minute-to-minute basis for a patient who is critically ill.'' Healthcare professionals working in these units should be fully trained and experienced to operate ventilator machines and provide close patient monitoring. In a labour ward, critically ill-ventilated women will not always receive close monitoring due to the layout, staffing, and availability of necessary resources.

A study done in the Eastern Cape by Wibbelink, James and Thomson (2022:10) clearly indicated that stress was observed among the midwife participants mainly due to staff inefficiency due to shortages resulting in a very busy working schedule. The physical environment was a cause for concern since employees had to deal with closely packed work spaces, ineffective equipment, and inadequate tools.

Obstetrical critical care units provide dedicated level 2 and 3 critical care in hospitals. These units can provide long-term ventilation for critically ill women until they are stable (Langenegger et al., 2019:132). Labour wards are usually equipped to handle obstetric emergencies and childbirth-related procedures. When women require ventilation due to respiratory distress or other obstetric complications during labour or immediately after birth, the labour ward may commence short-term mechanical ventilation to stabilize the women while plans are made to transfer to a critical care unit. However, from the researcher's personal experience of working in the labour ward, transferring a woman to an ICU may not always be immediately feasible due to factors like bed availability. There seems to be a lack of skills among midwives in the labour ward in rendering the best possible care for mechanically ventilated women, as the only training that these midwives can access is when a specialist nurse from the ICU comes to the labour ward area to connect a ventilator machine and set it up.

Women who are mechanically ventilated in a labour ward are cared for in the labour ward for extended periods rather than being transferred to an ICU for further care and management, and women ventilated in the casualty department, theatre, and high care areas usually get prioritized first to get the next available bed in the ICU over ventilated women in the labour ward. This puts midwives under pressure, and it is not known if midwives caring for mechanically ventilated women are fully equipped with the skills to provide the best possible care for these women. Exploring the challenges midwives experience taking care of

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mechanically ventilated women in the labour ward of a public tertiary-level hospital will help to recommend better ways of managing and transferring mechanically ventilated women to ICUs.

1.2 PROBLEM STATEMENT

Langenegger and Hall (2021:3) indicated that obstetricians practicing in tertiary hospitals in low- and middle-income countries are increasingly confronted with critically ill women. Moreover, doctors and nurses with little critical care experience are charged with caring for these women in a crowded labour ward with minimal access to intensive care unit services. A study in India found that “38 percent of the patients could not receive critical care unit care due to a lack or shortage of facilities” (Kaur et al., 2017:382). Maternal mortality was considerably decreased and maternal outcomes improved when well-managed high dependency and ICUs were established at healthcare facilities that managed large numbers of high-risk maternity cases (Surekha et al., 2018:1).

According to Maphumulo and Bhengu (2019:2), Africa has less than one health worker per 1,000 people, compared to ten in Europe. The uneven distribution of health experts between the private and public sectors exacerbates health issues. Maphumulo and Bengu (2019:4) stated that only 16% of South Africans are covered by medical aid plans, which are administered by the private sector. According to ECONEX, a South African organization that provides information on health care (2013:1), the public sector is under-resourced and under-funded.

The competence of health care workers can help prevent maternal deaths of critically ill women in South Africa (Mahada, Tshitangano and Mudau, 2023:1252-1253). Labour wards of tertiary hospitals in South Africa mostly deal with high-risk obstetrics women. Once these women complicate, they are mechanically ventilated and need an ICU for further care and management.

The researcher witnessed increasingly high numbers of women being mechanically ventilated in a normal labour ward where she works as a midwife, and these women were cared for by midwives instead of by an ICU-trained nurse. The midwives were caring for mechanically ventilated women with inadequate knowledge and training but relied on advice from ICU colleagues due to the unavailability of ICU beds. The maternal mortality and morbidity committee of the hospital stated that midwives in the labour ward are not competent enough to monitor, assess, and evaluate mechanically ventilated women. The mechanically ventilated women therefore did not seem to be receiving the best possible care, and the researcher observed that the women's condition often got worse, with more complications leading to

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maternal deaths. The selected tertiary hospital where the study was conducted had 28 maternal deaths in 2020, and 14 women died while being mechanically ventilated. Eight women were mechanically ventilated in the labour ward.

Best patient care practice specifies that women who are critically ill and need ventilation should be stabilised in the labour ward and transferred to an intensive care unit where there are qualified and experienced healthcare workers (South African Nursing Council competencies for critical care nurse specialist (adult), 2014:1). This is often not the case; therefore, the researcher wished to understand the challenges that midwives with inadequate skills experienced while caring for women being mechanically ventilated in a normal labour ward at the selected tertiary hospital in Gauteng province, South Africa.

1.3 AIM, RESEARCH QUESTION AND OBJECTIVES OF THE STUDY

The study aimed to explore and describe the challenges midwives experienced while taking care of ventilated women in a labour ward of a public tertiary hospital.

To achieve the aim, the study wished to answer the following research question:
What challenges do midwives experience when taking care of ventilated women in a labour ward at a public hospital?

The objectives of the study were to:

- To explore and describe the challenges midwives experienced while taking care of ventilated women in a labour ward of a public tertiary hospital.
- To make recommendations to improve the challenges midwives experienced while taking care of ventilated women in a labour ward of a public tertiary hospital.

1.4 SIGNIFICANCE OF THE STUDY

The findings of the study should assist hospitals with staff and resource management and the development of policies to take care of ventilated women in a labour ward. Hospitals may be provided with resources and more critical care-skilled nurses to manage ventilated women in labour wards. Exploring the current practice and problems of caring for ventilated women in the labour ward should assist in the revision of existing policies to make them more practical. The community at large might benefit from the study because maternal mortality and morbidity rates may be reduced if the study's recommendations are implemented. This, in turn, would help to reduce litigation as women would be cared for by

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competent nurses. The findings should further benefit nursing education by adding to local and international knowledge in terms of providing optimal care for critically ill ventilated obstetric women.

1.5 DELINEATION

The study focused on challenges midwives experienced taking care of ventilated women in a labour ward at a selected public hospital in Gauteng province, South Africa.

1.6 PARADIGM AND ASSUMPTIONS

The researcher used interpretivism as a paradigm. Interpretivists wish to understand individuals and their interpretations of the world around them. Interpretivism is a subject-based strategy that emphasizes the subjective importance of active perception and alteration of reality to achieve effective organizational outcomes (Pervin and Mokhtar, 2022:421). In this study, the interpretive paradigm relied on subjective interaction between the researcher and participants to employ meaning-oriented approaches when interviewing participants. Interpretivism is underpinned by ontological, epistemological, and methodological assumptions.

1.6.1 Ontological assumptions

Ontology is the study of being or reality and deals with the nature of reality and truth. According to Bradshaw, Atkinson and Doody (2017:2), ontology is interested in what makes something real, what the real world is like, and what can be learned about it. The same authors add that the ontological perspective of qualitative descriptive research is relativism, which maintains that reality is subjective and differs from person to person. The interpretive research paradigm includes strategies such as interviews for the researcher to understand the challenges that midwives face. This helped the researcher interpret the participant midwives' opinions, feelings, and experiences. The researcher was looking for recommendations from the midwives as participants.

1.6.2 Epistemological assumptions

Epistemology is concerned with the nature of knowledge, its possibility, scope, and general basis. Epistemology relates to how knowledge may be formed, developed, and transmitted, as well as what it means to know and what the relationship between the would-be knower and what can be known is like (Polit and Beck, 2017:10). Subjectivism is the epistemological perspective of qualitative research; it recognizes the existence of all objects and relies solely on the subjective awareness of everyone (Bradshaw, Atkinson and Doody, 2017:2).

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Accordingly, the researcher explored the challenges that midwives faced while nursing critically ill ventilated women by engaging with the participants.

1.6.3 Methodological assumptions

Methodology is a strategy or plan of action that links methods to outcomes and governs researchers' choice and use of methods and the process of the research. Methodological assumptions consider how researchers go about discovering what they believe can be known. A qualitative descriptive design goes beyond a precise representation of the data and tries to interpret the findings without straying too far from them (Bradshaw, Atkinson and Doody, 2017:3). The researcher therefore used semi-structured interviews to explore and describe the challenges the participants faced and experienced.

1.7 RESEARCH DESIGN AND METHODS

The researcher selected a qualitative, exploratory, descriptive, and contextual research design and methods to explore and describe the challenges midwives experienced caring for mechanically ventilated women in a labour ward of a selected public tertiary hospital. A descriptive and exploratory research design enabled the researcher to describe the participants' experiences regarding caring for mechanically ventilated women in the labour ward of the selected hospital. Purposive and convenience sampling was used to select 13 participants.

The researcher collected data using in-depth, semi-structured interviews and took field notes as well. The data from the interviews were analysed using thematic analysis. Thematic analysis is the process of creating themes by coding qualitative data (Dawadi, 2020:62). Trustworthiness was ensured through credibility, confirmability, transformability, dependability, and authenticity. The researcher upheld the ethical considerations of a scientific inquiry involving human beings, including approval and permission to conduct the study, informed consent, confidentiality, anonymity, beneficence, and justice. The research methodology is discussed in Chapter 3 and summarized in Table 1.1.

Table 1.1 Research design and methodology

Aspect	Description
Research design	The study utilized an exploratory research design to explore the challenges faced by midwives in a standard labour ward at a selected public hospital and make recommendations to overcome the challenges (see Chapter 3.2.1).

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	The researcher used a descriptive research approach to give a thorough account of the challenges midwives experience when caring for mechanically ventilated women in a labour ward of a public tertiary hospital (see Chapter 3.2.2).
Context	One maternity/labour ward in a selected public provincial tertiary hospital in Ekurhuleni, Gauteng (see Chapter 3.3.3)
Population	Midwives working in the maternity unit of a selected public hospital in Ekurhuleni (see Chapter 3.4)
Sampling	• Non-probability purposive sampling • Participants were midwives working in the maternity unit of the selected hospital with at least two years' experience, had nursed one or two ventilated women and encountered challenges in nursing critically ill ventilated women. • The sample consisted of 13 midwives. • Data saturation was reached after 8 interviews (see Chapter 3.5)
Data collection	One-on-one interviews (see Chapter 3.6)
Data analysis	A qualitative content analysis approach was used (see Chapter 3.8)
Trustworthiness	Strategies to enhance trustworthiness included: credibility, dependability, confirmability, transferability and authenticity (see Chapter 3.9)

1.8 DEFINITIONS OF KEY TERMS

In this study, the following terms were used, as defined below:

- **Challenge**

A challenge is a new, difficult, or complex task that necessitates effort, skill, and determination for its achievement (Cambridge Dictionary, 2019). In this study, challenges referred to the difficulties or complex tasks midwives encountered caring for ventilated women in a labour ward unit.

- **Mechanical ventilation**

Mechanical ventilation refers to the technique of using devices to assist in the movement of oxygen and carbon dioxide between the atmosphere and the alveoli to improve pulmonary gas exchange (Walter, 2021:1452). In this study, mechanical ventilation referred to a process

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where the ventilator was connected to obstetric women via an artificial airway that ran through their mouth and into their main airway. The women would need the ventilator until after they were transferred to an ICU.

- **Intensive/critical care unit**

An intensive care unit (ICU) is a type of critical care unit that delivers intense care medication and specialized care to critically ill patients, as well as injuries and life-threatening diseases. The unit is fitted with specialized equipment and qualified staff who keep a close eye on suitable medicine and observations (Marshall et al., 2017:271). In this study, intensive care is care that is provided at a higher level of care than provided in ordinary wards, and the care should be provided by midwifery staff with ICU training.

- **Midwife**

The South African Nursing Council (SANC, 2005) defines a midwife as a person who is qualified and competent to independently practice midwifery in the manner and level prescribed and who can assume responsibility and accountability for such practice. In this study, a midwife referred to any professional nurse registered with the South African Nursing Council with the qualifications of midwifery who had been working in a maternity ward for at least two years.

- **Labour ward**

In this study, a labour ward is a ward or department of a hospital for the care and admission of women in the process of childbirth (Garg and Dewan, 2022:203). Labour ward refers to such a ward in the research setting.

- Obstetrician

An obstetrician is a medical doctor who focuses on pregnant women and helping people from the time they find out they are pregnant up to the time after birth. They diagnose and manage illness that only occur in pregnancy, and they also do surgical procedures associated with child birth (sasog.co.za, 2024).

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- Advanced Midwife specialist

A Midwife Specialist is a registered Professional Nurse and Midwife who has post-basic knowledge and skills specifically in Midwifery and hold a certificate in Midwifery in line with the South African Nursing Council. According to the explanation of the Midwife Specialist role, they work as leaders, clinical specialists and consultants, managers, researchers, change agents, and advocates in Midwifery including Neonatal Care as well as giving direction at the Local, National, Regional, and International Levels (South African Nursing Council COMPETENCIES FOR MIDWIFE SPECIALIST, 2014:1).

- Enrolled Nurse

An enrolled nurse shall perform such nursing care as may be allowed by his enrolment under the supervision, direction or tacit approval of a registered of midwife (SANC, 2005)

1.9 ETHICAL CONSIDERATIONS

Ethics deals with matters of right and wrong. When humans are used as study participants, care must be taken to ensure that their well-being and rights are protected (Brink and Van Rensburg, 2018:28). Accordingly, the researcher obtained permission to conduct the study, obtained informed consent from the participants, and observed the ethical principles of beneficence, respect for human dignity, and justice (Brink and Van Rensburg, 2018:29-31). The researcher obtained ethical clearance and permission to conduct the study from the University of Pretoria, the National Department of Health and the selected hospital, and upheld the ethical principles of autonomy (informed consent), privacy, confidentiality, and beneficence during the study (see Chapter 3 for discussion).

1.10 ORGANISATION OF THE DISSERTATION

The study consists of five chapters:

- Chapter 1: Orientation to the study - introduces and describes the background, research problem, and aims and objectives of the study.
- Chapter 2: Literature review - discusses the literature reviewed related to the topic.
- Chapter 3: Research design and methodology - presents the research design and methods used to conduct the study.
- Chapter 4: Findings and literature control - analyses and interprets the data and discusses the findings.

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- Chapter 5: Conclusion of Findings, limitations, and recommendations – concludes the study, outlines the limitations encountered, and makes recommendations for practice and further study.

1.11 CONCLUSION

This chapter outlined the study, including the aim, paradigm and assumptions, research design and methods, and definitions of key terms. Chapter 2 discusses the literature review conducted for the study.

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CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

Chapter 1 outlined the research problem, aim, paradigm, research design, and methodology of the study and defined key terms. This chapter discusses the literature review conducted on the challenges midwives experience in caring for ventilated women in a labour ward.

A literature review is an organized, written presentation of what has been published on a topic and involves researching, reading, and understanding literature relevant to a study (Burns, Grove and Gray, 2017:120). A literature review involves researching, reading, and understanding literature relevant to the study (Brink, van der Walt and van Rensburg, 2018:55). The purpose of a literature review is to convey what is currently known regarding the topic of interest and to assist researchers in comprehending and extending their knowledge of the phenomenon under study (Polit and Beck, 2017:733).

2.2 MIDWIVES CARING FOR MECHANICALLY VENTILATED WOMEN GLOBALLY

In the UK, the provision of level 3 maternal care is recommended for women who require mechanical ventilation for respiratory support or support of two or more organs (Koukoubanis et al., 2021:4). James et al. (2019:3) found that midwives employed in tertiary referral centres offer obstetric high-dependency care. Obstetric high-dependency care refers to a temporary level of care for women who need procedures beyond the (specialized) "high risk" obstetric care provided regularly in a consultant-led labour ward (James et al., 2019:3).

In their study in Punjab, India, Preetkamal et al. (2019:1294) emphasized that the intensive care unit must be a highly specialized and sophisticated area of the hospital that is specifically designed, staffed, furnished, and equipped for the management of critically ill women, injuries, or complications to provide the intensive monitoring necessary for managing critical illness in pregnancy. Moreover, training in emergency obstetrics is necessary to identify and treat complications immediately (Preetkamal et al., 2019:1294–1295).

Acute pulmonary oedema is a severe disease with high maternal morbidity and mortality rates. A study of 50 women in north-eastern Brazil found that pulmonary oedema occurred antepartum, postpartum, or intrapartum, with hypertension being the most common cause. Fluid overload was an important trigger in the 24 hours preceding acute pulmonary oedema (Pordeus et al., 2018:1). Women with acute respiratory failure caused by cardiogenic

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pulmonary oedema may require mechanical ventilation, which can lead to additional lung injury (Amado-Rodríguez et al., 2022:1).

In India, Jamal et al. (2018:1840) found that conditions that required ICU admissions included pregnancy-related hypertensive disorders (47.8%) and postpartum haemorrhage (12.6%). Most admissions (63.4%) occurred during the postpartum period; sepsis (28.2%) and anaemia (35.2%) were both present in several cases, and 30.9% of the women needed mechanical ventilation.

In Beijing, China, Zhao et al. (2021:2) emphasized that mechanical ventilation is a crucial and fundamental life support technique for obstetric women admitted to the ICU. Although it is not common for obstetric women to require critical care, midwives must provide comprehensive care for obstetric women in critical situations. More midwifery care is needed for obstetric critical care than is often provided by the number of midwifery hours per woman per day in maternity units. In Wales, UK, there are different levels of obstetric critical care (NHS Public Health Department Wales 2023:18):

- Level one: Level one is for those who have recently left intensive care or those whose conditions could worsen and require closer monitoring and is capable of being handled in a maternity setting with one-on-one midwifery care (or nursing care under a midwife's direct supervision). Their clinical indications include the following: significant postpartum haemorrhage characterized by the need for more frequent than usual monitoring, infusion of therapeutic oxytocin, pre-eclampsia necessitating infusion of magnesium sulphate or intravenous anti-hypertensive, using a face mask with 50% or less oxygen (O2) to keep saturation levels above 90%, stable rupture of the uterus, and stable sepsis.
- Level two: Level two is a high-dependency unit requiring invasive monitoring and intervention at least twice a day, except for advanced respiratory support for the care of a single failing organ system. The midwife and the obstetric team will assess the woman. Care requires treatment from a high-dependency unit nurse with telephonic guidance from the maternity midwife, for example, the obstetrics magnesium infusion policy. Clinical indications and examples of respiratory assistance are a face mask for oxygen, continuous positive airway pressure and bi-level positive airway pressure for saturation, and a central venous pressure line for fluid management. The concurrent administration of anti-arrhythmic, antihypertensive, and vasoactive medications is necessary for advanced cardiovascular support. Neurological support encompasses

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intracranial pressure monitoring, hepatic support for acute fulminant hepatic failure, and magnesium infusion for seizures.

- Level three: Level three involves an ICU requiring either basic respiratory support in addition to the support of at least one more organ or advanced respiratory support (mechanical ventilation) alone. Upon admission to the ICU, the midwife and the obstetric team will assess the woman at least twice a day. The women will require care from an ICU nurse with phone guidance from the maternity midwife, for example, the obstetrics magnesium infusion policy. The clinical indications are invasive mechanical ventilation, advanced respiratory support, support for two or more organ systems, including respiratory and cardiovascular support, support for the kidneys and lungs, and other organ support. Additional conditions include severe HELLP syndrome, disseminated intravascular coagulation, brain haemorrhage, pulmonary embolism or oedema, and any persistently deteriorating findings or conditions.

In England, Wales, and Scotland, 21% of maternal admissions to critical care are pregnant, 46% occur on the day of birth itself, and 23% occur in the six days after birth. Most women leave the ICU in less than two days, and less than 6% remain there for more than a week. Infection, haemorrhage, and pre-eclampsia comprise almost 60% of the diagnoses that are admitted (Banerjee and Cantellow, 2021:141). Banerjee and Cantellow (2021:141) add that non-invasive ventilation is used in pregnancy, but gastric hyperinflation is a risk. Pregnancy is associated with additional risks in the obstetric airway. Conventional gas exchange targets are a PaO2 of 9 kPa (to allow sufficient foetal oxygen transfer) and a lower PaCO2 range of between 4.0 and 4.5 kPa. Hypercarbia can cause foetal acidosis, but it is not recommended in pregnancy. In late pregnancy, pleural pressure is likely to be higher, reducing transpulmonary pressure relative to airway pressure. Advanced gestation is associated with an increased tendency for de-recruitment of the posterobasal segments of the lung, so some advocate using the airway pressure release ventilation mode.

Mechanical ventilation is crucial in ICUs for pregnant women to rest their fatigued respiratory muscles and enable gas exchange. This involves invasive or non-invasive mechanical support to overcome airway resistance and lung elastic properties. Epithelial and endothelial injury causes pulmonary oedema, hypoxemia, and increased airway resistance (Ernesto et al., 2020:3).

The management of critically ill women in obstetrics is a challenge owing to the changed physiology and unpredictability of disease behaviour (Jamal et al., 2018:1840). Intensive care units see 0.4% to 16% of seriously ill obstetric women each year, and the projected mortality

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rate for these women is 5% of all admissions. If not treated appropriately and promptly, acute respiratory failure is one of the primary reasons for ICU admission and can result in serious consequences for both the mother and the foetus. Due to the cardiorespiratory changes brought on by pregnancy, obstetric women with acute respiratory failure have specific characteristics that make managing them difficult. Clinicians must be aware of these anatomical and physiological changes in order to modify the way that mechanical ventilation is managed (Ernesto et al., 2020:1).

There are several physiological changes during pregnancy (Ernesto et al., 2020:1). The nasal mucosa and oropharynx undergo substantial alterations during pregnancy, including hyperaemia, oedema, plasma leakage, glandular hypersecretion, and elevated phagocytic activity. These alterations are principally mediated by oestrogens, which cause capillary congestion and mucous gland hyperplasia. Humoral alterations lead to increased production of relaxin, which relaxes the inferior rib cage and the pelvic ligament. The anteroposterior and transverse dimensions increase as the thoracic cage's subcostal angle expands. The diaphragm is displaced by uterine growth, and 24 weeks after delivery, the chest wall returns to normal (Ernesto et al., 2020:2). Because of the elevated diaphragm and decreased abdominal downward traction, there is a 20% to 30% drop in functional residual capacity. Inspiratory capacity rises as a compensatory mechanism. Pregnancy does not appear to significantly alter flow resistance based on routine spirometric measures (Ernesto et al., 2020:2).

Oxygen consumption in obstetric women increases by 20% to 40%, reducing the maternal oxygen reserve and increasing their susceptibility to stress. The alveolar-arterial gradient increases and minute volume increases, leading to a decrease in arterial pressure of CO2 (PaCO2) during the third trimester of gestation (Ernesto et al., 2020:2). This increases the maternal-foetal oxygen gradient and facilitates gas exchange. Pregnant women are particularly susceptible to pulmonary oedema, which can be precipitated by an increased cardiac preload or pulmonary capillary permeability. Maternal oxygenation in cases of respiratory failure should be greater than 95%, or 70 mm Hg, since foetuses cannot withstand hypoxemia or acidosis (Ernesto et al., 2020:3). Due to symptoms such as dyspnea, increased ventilatory muscle strain, and ventilatory exhaustion, pregnant women with persistent acute respiratory failure should be referred for mechanical ventilation. Obstetric women may experience airway trouble due to foetal, maternal, surgical, or environmental causes (Ernesto et al., 2020:3).

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2.3 MIDWIVES CARING FOR MECHANICALLY VENTILATED WOMEN IN SUB-SAHARAN AFRICA

The maternal mortality rates in low- and middle-income countries in sub-Saharan Africa remain high. By 2030, Africa will not achieve the Sustainable Development Goal (SDG) of 70 per 100,000 live births; instead, an estimated 370 women will die in childbirth for every 100,000 live births (World Health Organization, 2023). Therefore, Africa and its partners need to implement accelerated efforts to reduce the MMR by approximately 13% per year in order to meet the 2030 Sustainable Development Goals (Tasew et al., 2022:1). Although maternal mortality has decreased dramatically globally since 2000, 810 women still die daily from avoidable pregnancy- and childbirth-related problems, with most of these fatalities occurring in sub-Saharan Africa (van Tetering et al., 2023:2).

Maternal morbidity and mortality are significant issues globally, with sub-Saharan Africa having a high maternal mortality rate. Despite the Safe Motherhood Initiative, significant reductions in maternal mortality and disability have not been achieved. The management of critically ill obstetric women is very challenging due to poverty, lack of access to healthcare, and lack of health education (Onyekwulu and Okeke 2019:1420). In a nine-year retrospective study in one tertiary hospital in Enugu, Nigeria, Onyekwulu and Okeke (2019:1422) found that the most common obstetric cases admitted into the ICU were pre-eclampsia (28.8%) and obstetric haemorrhage (24.7%). The overall mortality rate was 39%. Miscellaneous cases included thyrotoxicosis, severe asthma, anaesthetic complications, and diabetes mellitus. Most deaths occurred within the first three days of admission, with the primary causes being respiratory failure, unconsciousness, multiple organ failure, and severe sepsis. The main intervention carried out in the ICU was mechanical ventilation. Labetalol was a frequently utilized hypotensive medication in this center; inotropic drugs, such as dopamine and/or norepinephrine, were given as needed. The only blood products used in women with HELLP (Haemolysis Elevated Liver Enzymes Low Platelet) syndrome (5.5%) and disseminated intravascular coagulation (DIC) (6.8%) were fresh frozen plasma and platelet concentrate. Severe sepsis (9.6%), acute renal injury (6.8%), and cerebrovascular accident (1.4%) were among the other comorbidities noted. In cases of puerperal sepsis (n = 1), obstetric hemorrhage (n = 5), and ruptured ectopic pregnancy (salpingectomy, n = 8), an exploratory laparotomy was performed. The reason for the hysterectomy was bleeding during pregnancy.

Despite international commitment to Millennium Development Goal 5: Improve maternal health, maternal morbidity and mortality remain high in low- and middle-income countries (LMICs) in sub-Saharan Africa, partly due to infrastructure gaps, including the availability of

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ICUs. In Malawi, Prin et al. (2019:2) found that a woman's lifetime risk of maternal mortality was 1 in 38, with ICU admission being a marker of severe maternal morbidity. Kamuzu Central Hospital in Lilongwe, Malawi, is the leading public health service referral and tertiary care facility for the Central Region and the largest hospital in Malawi. In their study of 105 obstetric women admitted to the ICU between September 2017 and March 2018 at Kamuzu Central Hospital (KCH), Prin et al. (2019:4) found that 79% had undergone recent surgery; 52% had an abdominal or caesarean hysterectomy; 40% had a caesarean delivery; 95% required mechanical ventilation; and 48% required vasopressors. Overall, in-hospital mortality was 49%. The study recommended investments in improving infrastructure and care gaps, including addressing available ICU beds and blood-banking needs and increasing the number of care providers trained in managing critically ill obstetric women (Prin et al., 2019:4).

In low-income countries like Ethiopia, the rate of obstetric deaths in intensive care units is significant (Tasew et al., 2022:2). In their study of obstetric mortality in the intensive care unit of Addis Ababa Public Hospital in 2020/21, Tasew et al. (2022:2) found a maternal mortality ratio of 156/100000, with preeclampsia, postpartum hemorrhage, and puerperal sepsis contributing significantly. A study done by Hassen et al. (2023:1) indicated the following: More than half of the midwives (51.4%) had poor knowledge of mechanical ventilation, with 76.7% not knowing the amount of PaO2 needed to initiate a mechanical ventilator and 63.7% not knowing the parameters of the mechanical ventilator, and the majority (58.9%) of midwives had poor practice in caring for mechanically ventilated women, with 90.4% not suctioning as needed and 72.6% not instilling normal saline before suctioning.

Large tertiary referral hospitals in sub-Saharan Africa are located in crowded urban areas, which were often the epicentres of the COVID-19 pandemic. A study in six referral hospitals in Guinea, Nigeria, Tanzania, and Uganda assessed how maternal healthcare was provided during the first year of the COVID-19 pandemic (Semaan et al., 2022:1). The main challenges were lack of knowledge of COVID-19, shortage of personal protective equipment, and no rapid testing for women suspected of COVID-19. The study found that routine maternal care provision was maintained in the hospitals despite the challenges, and the skilled health personnel contributed to guideline development for pregnant women suspected or confirmed with COVID-19 (Semaan et al., 2022:14–15).

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2.4 CONTINUATION OF MIDWIVES NURSING VENTILATED WOMEN IN LABOUR WARDS IN SUB SAHARAN, SOUTH AFRICA

Pregnancy is a natural physiological process that normally ends uneventfully. However, there are times when admission to an ICU is necessary (Motiang, 2017:12). In a retrospective study of 210 pregnant and postpartum women admitted to the ICU of an academic hospital in Ga-Rankuwa, Gauteng, from 2008 to 2011, Motiang (2017:13) found that the most common causes of admission were pre-existing cardiac disease (44.3%), eclampsia and pre-eclampsia (20%), obstetric haemorrhage (16.2%), and pulmonary oedema (6.2%), and 61% received ventilatory support, with a median length of ICU stay of 24 hours. The maternal mortality rate was 9%, with intracerebral haemorrhage being the major cause of death. Most of the women (87.1%) were haemodynamically stable and needed minimal intervention. Many of the women were admitted to the ICU for monitoring and did not require ICU care (Motiang, 2017:14).

Obstetric medicine is the management and care of medically complicated pregnancies during the pre-, intra- or postpartum period. These complications can be caused by pre-existing medical conditions or conditions presenting during pregnancy for the first time. Obstetric medicine is a fairly well-established sub-speciality in several developed countries. South Africa is regarded as a developing country; however, it has no structured obstetric medicine training programme (Wium, Vannevel and Bothma, 2018:27). The South African medical system is divided into private and public care, and over 80% of births take place in the public sector. Most public sector obstetric medical care in South Africa is provided by midwives in primary care facilities. Of all births, 60% take place at primary level Community Health Centres and District Hospitals, 25% at regional hospitals and 15% at tertiary hospitals. Complicated or predicted high-risk women are referred to secondary or tertiary hospitals for specialized care by trained obstetricians, and academic hospitals have a maternal and foetal medicine unit (MAFU) with MAFU sub-specialists (Wium, Vannevel and Bothma, 2018:28-29).

A retrospective descriptive study conducted in Gqeberha in the Eastern Cape by Makrexeni and Mabenge (2023:1) investigated the characteristics, clinical data, and outcomes of 1498 obstetric women admitted to the HCU of Dora Nginza Hospital and transferred to the ICU at Livingstone Hospital. The most common reasons for admission to the HCU were respiratory infections (75/1498; 5.0%), chronic diseases (96/1498; 6.4%), obstetric haemorrhage (481/1498; 32.1%), and hypertensive disorders (843/1498; 5.3%). Of the women, 31/1498 (2.1%) were transferred to the ICU in the Livingstone Hospital due to postpartum haemorrhage (25.8%) and pregnancy-related hypertensive disorders (29.0%).

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A study at a tertiary hospital in Limpopo Province examined the characteristics of obstetric women admitted to the ICU (Ntuli et al., 2015:8). The most common reasons for obstetric ICU admissions were pre-eclampsia or eclampsia (52.9%) and obstetric haemorrhage (18.1%), and the MMR was 34.8% (Ntuli et al., 2015:8). Additionally, pulmonary oedema was frequently a side effect of preeclampsia. Acute pulmonary oedema affects 0.08% to 1.5% of women during pregnancy and postpartum. It accounts for 1.5% of ICU admissions and occurs in 9.3% of patients with near-miss criteria.

In 2021, Hastings-Tolsma et al. (2021:1) examined the experience of midwives in providing care to labouring women in Gauteng in private and public hospitals or an independent maternity hospital. The participant midwives expressed frustration with systems that failed to allow independent functioning, disallowed them a voice in making decisions and creating change, and policies that prevented utilization consistent with the scope of practice. Those in public settings expressed concern with restricted resource appropriation, congested labour wards, and a lack of medical professionals. The study indicated a clear need to upscale midwifery education and establish care competencies to be met in providing clinical services (Hastings-Tolsma et al., 2021:1).

A study at Tygerberg Hospital in Parow, Cape Town, investigated the outcomes of critically ill obstetric women managed in an obstetrician-led critical care unit (Langenegger et al., 2019:132). An obstetric critical care unit aims to be able to provide complete intensive care and short-term ventilation before transferring the woman to a general intensive care unit, or if no such bed is available. Women with severe maternal morbidity managed in the labour ward of Tygerberg Hospital were studied over three months before the establishment of the obstetrician-led obstetric critical care unit. One year later, women in the obstetric critical care unit were studied using the same methods. The before-obstetric critical care unit audit included 63 women (Langenegger et al., 2019:133). In the second period, 60 women were admitted to the obstetric critical care unit. There were no significant differences between the two groups in baseline characteristics, admission indications, or their acute physiology and chronic health evaluation scores (Langenegger et al., 2019:134). Continuous positive airway pressure was used more in the second group. There were seven maternal deaths in the first group, but none in the second group. The study demonstrated a significant reduction in maternal deaths when women were managed in an obstetric critical care unit and not in a standard labour ward unit (Langenegger et al., 2019:136).

Langenegger et al. (2019:132) assessed the provision and organization of maternal critical care services in South Africa. The primary causes of critical illness, criteria to determine which

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women would benefit from obstetric critical care intervention, and evidence-based strategies or outcomes are lacking in existing models. The South African Department of Health currently does not support the creation of obstetric critical care units (OCCUs) as a means of addressing unnecessary mortality because of these omissions and inadequate resources (Langenegger et al., 2019:132–134).

2.5 BARRIERS TO ICU ACCESS

Nearly 15% of all pregnancies end in fatal perinatal obstetric complications, including bleeding, infections, hypertension, obstructed labour and complications of abortion. Between 1990 and 2015, an estimated 10.7 million women died due to obstetric complications, and 66% of these maternal deaths were attributed to sub-Saharan Africa (Geleto et al., 2018:2). Emergency obstetric care (EmOC) facilities, including basic and comprehensive types, have been instrumental in reducing maternal mortality rates (MMR) since 1990 (Geleto et al., 2018:2–3). In sub-Saharan Africa, however, there is poor utilization of EmOC among women with obstetric complications. Different factors can hinder women's ability to access and use emergency obstetric services. Therefore, Geleto et al. (2018:2-3) conducted a systematic review on barriers to accessing and using EmOC in sub-Saharan Africa. The study used Thaddeus and Maine's (1994) 'three delays' model to identify barriers to accessing and utilizing EmOC. Geleto et al. (2018:2-3) found that in sub-Saharan Africa, access to EmOC services is influenced by factors such as unavailability, lack of knowledge about pregnancy complications, poor awareness of availability, and poor quality of services. Socio-cultural factors, accessibility and affordability of the service, and quality of care may also impact the length of each delay (Geleto et al., 2018:3).

2.6 CONCLUSION

This chapter discussed the literature review conducted for the study on midwives caring for mechanically ventilated women globally in sub-Saharan Africa and South Africa, challenges encountered, and barriers to ICU access.

The literature review makes the case that some women that are taken care of by midwives become critically ill during their pregnancy and labour and require specialized care, but there are limited resources available when they require mechanical ventilation. Some women are cared for in maternity wards.

Chapter 3 describes the research design and methodology of the study.

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CHAPTER 3: RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

Chapter 2 discussed the literature review. This chapter describes the research design and methodology, including the population, sampling, data collection and analysis, trustworthiness, and ethical considerations.

3.2 RESEARCH DESIGN

A research design is an overall plan for addressing a research question, including the specifications for enhancing the integrity of the study (Polit and Beck, 2017:793). The researcher selected a qualitative, explorative, and descriptive research design for the study. Qualitative research is the investigation of phenomena, typically in an in-depth and holistic fashion, through the collection of rich narrative materials using a flexible research design (Polit and Beck, 2017:741). Qualitative studies use several designs and methods to study the phenomenon and generate in-depth information (Moser and Korstjens, 2017:271). A qualitative research design aims to describe and understand the phenomenon being studied by gathering data from an insider perspective in a naturalistic setting (Patel and Patel, 2019:49).

The researcher considered a qualitative research design appropriate to explore and describe the challenges midwives experienced when taking care of ventilated women in a labour ward in an in-depth way. The study was conducted in a labour ward at a selected public hospital in Gauteng province, the natural setting where midwives experienced the research phenomenon.

3.2.1 Types of research designs

3.2.1.1 Qualitative

A qualitative research design is used when little is known about the phenomenon and to provide the answer to the research question (Brink and van Rensburg, 2022:122). The researcher selected this research design to have the inquiry based on the participants' perspectives (Polit and Beck, 2017:743). Qualitative research uses a real-life approach that seeks to understand the phenomenon under study through the individuals' life experiences (Patel and Patel, 2019:49). The main purpose of conducting qualitative research is to discover the nature of people's experiences and views of the phenomenon under study through exploring, describing, and understanding it (Brink and van Rensburg, 2022:122).

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In this study, a qualitative research design was utilized to enable the researcher to interact with the midwives to explore and understand the midwives' perspectives and views on their real-life work experiences through interviews.

3.2.1.2 Explorative

Exploratory studies focus on gaining insight into a phenomenon or situation (Polit and Beck, 2017:728). An explorative research design was used in the study to explore the challenges midwives experienced taking care of ventilated women in a labour ward at a selected public hospital and to make recommendations to overcome them. Exploratory research is done to learn more about the topic being examined and to acquire deeper insight (Patel and Patel, 2019:49–50).

The researcher explored the participants' challenges they experienced during their practice to gain deeper insight and learn more about their suggestions to address the problem.

3.2.1.3 Descriptive

Descriptive studies wish to observe, describe, and accurately portray the characteristics of specific situations and phenomena as they occur naturally. A systematic description of a situation or phenomenon explains what individuals think, feel, and perceive about their experiences and situations (Polit and Beck, 2017:726).

A descriptive research design allowed the researcher to present the topic as it occurred and to characterize the thoughts, feelings, and perceptions of midwives.

3.2.2 RESEARCH METHODOLOGY

Research methodology is the plan for conducting the specific steps of a study. Research methods are the techniques, steps, or procedures researchers use to collect, structure, and analyze data systematically (Polit and Beck, 2017:741). The research methodology includes the population, sample and sampling, and data collection, analysis, and interpretation.

3.2.2.1 Context

Qualitative research considers "the natural contexts in which individuals or groups function" (Moser and Korstjens, 2017:275). The research setting is the location where the data is collected. Qualitative researchers typically gather data in the field at the location where

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participants experience the phenomenon (Burns et al., 2017:353). In this study, the setting was the participants' workplace, an obstetric maternity unit in a selected tertiary public hospital in Ekurhuleni North Municipality, Gauteng. The purpose of the study was to understand the problem under study in the context of the participants' everyday lives. Accordingly, the participants were interviewed at the maternity obstetric labour ward unit where they worked. The setting was natural and not altered in any way, where face-to-face interviews were conducted to collect data.

South Africa has nine provinces, and the study was conducted in Gauteng province. Gauteng province is divided into six districts, and the focus was on the West Rand District municipality, which is one of the six districts. The study was conducted in Ekurhuleni Metropolitan Municipality, which is subdivided into Germiston, Alberton, Benoni, Edenvale, Kempton Park/Tembisa, Westville, and Rieger Park.

There are eight public hospitals in the Ekurhuleni Metropolitan Municipality. The selected public tertiary hospital serves a population of approximately 4.1 million and receives referrals from 34 local clinics, three maternity obstetric units (MOUs), and two community healthcare centres. The hospital's department of obstetrics and gynaecology statistics show approximately 1,500 births per month, which makes it the second-largest hospital with the most births in Gauteng. The labour ward has 22 beds, with four beds in the labour admission ward, seven labour ward high care beds, and 11 labour ward delivery beds. The maternity unit consists of healthcare professionals such as obstetricians, midwives, and advanced midwife specialists, and these healthcare professionals are trained to deal with obstetric emergencies and have minimal experience caring for ventilated women, where they face increasingly high numbers of critically ill women being ventilated in the maternity unit. When a ventilator is needed, they must borrow it from the ICU.

The staffing is as follows per shift: day shift (7/19) or night shift (19/7). In each shift, there are eight midwives and two enrolled nurses, with two allocated to labour ward high care. One midwife is allocated in the theatre, and four midwives are allocated in the delivery rooms. The selected public tertiary hospital has 10 ICU beds, of which only one is allocated for maternity women. At least one woman is ventilated in a period of one or two months. These women are often diagnosed with severe pre-eclampsia, HELLP syndrome, and pulmonary oedema. Figure 3.1 depicts the health district selected for the study.

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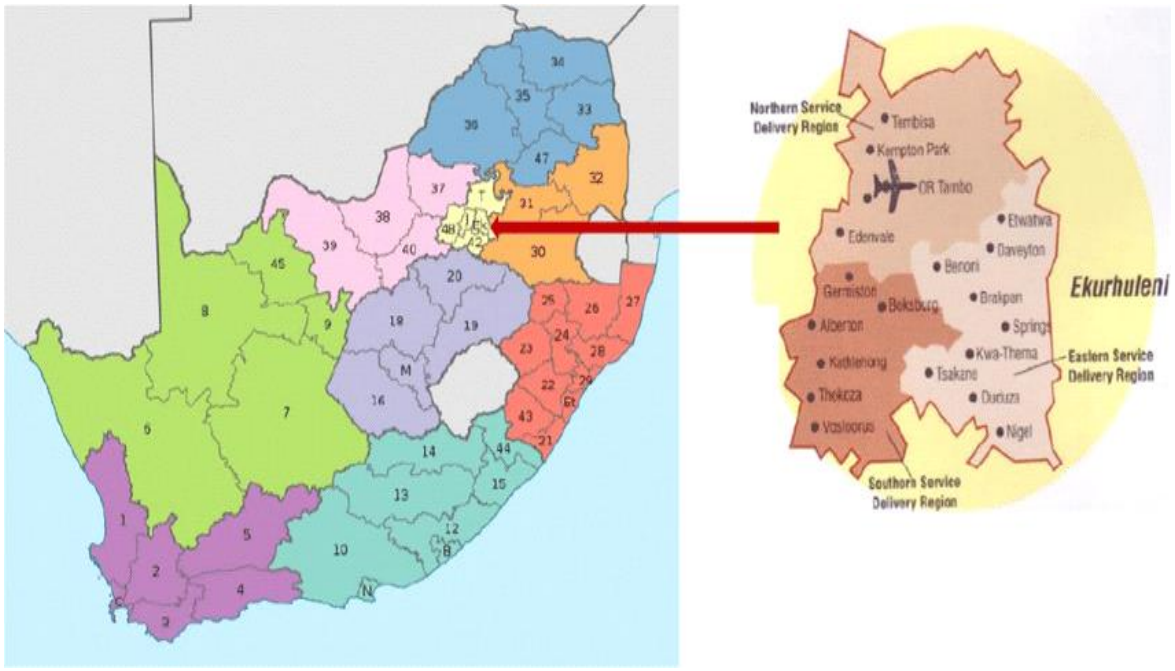

Figure 3.1 Map of South African health districts and Ekurhuleni

Sources: https://en.wikipedia.org/wiki/Districts_of_South_Africa and Ekurhuleni Integrated Development Plan Booklet, 2004

3.2.2.2 Population

A population is the entire aggregate of people or objects in which a researcher is interested (Polit and Beck, 2017:739). In this study, the population consisted of midwives permanently working in the maternity unit of the selected public hospital. About 34 trained midwives, 8 enrolled nurses were permanently employed in the labour ward delivery area at the hospital. Of the 34 midwives, only four were advanced midwife specialists and the others were midwives with no speciality.

3.2.2.3 Sampling and Sample

A sample is a group of people or elements that are selected for the study. Sampling is the process of selecting a part of the population to represent the total population (Brink and van Rensburg, 2022:140-141). Purposeful or non-probability sampling is used in qualitative research to select study participants because they understand the research problem and phenomenon under study.

In this study, the researcher used convenience sampling (Stratton, 2021:373). Only available midwives were invited to volunteer to participate in the study until data saturation was reached. Midwives who met the inclusion criteria were asked to participate. To be included in the study,

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the participants had to have worked in the maternity unit of the selected hospital for over two years, and have cared for at least one or two ventilated women. Midwives who had worked in the labour ward for less than two years and had never cared for critically ill ventilated women were not included in the study. The eight enrolled nurses working in the labour ward were excluded.

The researcher used non-probability purposive sampling to select information-rich participants based on their knowledge and experience of the topic under study (Stratton, 2021:373). The researcher used convenience sampling to obtain information from participants with a diverse range of experience and knowledge. The sample consisted of 13 midwives.

3.2.2.4 Data collection

Data collection is the process of collecting information (data) related to the research question in a systematic way to address a research problem (Polit and Beck, 2017:725). In this study, data was collected using semi-structured interviews (Polit and Beck, 2017:732), using an interview guide (see Annexure D).

The researcher presented the title of the research topic and its significance to four different shifts that work in the labour ward and encouraged midwives who were interested to participate. Face-to-face semi-structured interviews (DeJonckheere and Vaughn, 2019:1) allowed the researcher to acquire a deeper understanding of the challenges faced by the participants while caring for critically ill ventilated women. The CEO and nursing directors were informed about the study and the inclusion and exclusion criteria to invite potential participants eligible for inclusion before the interviews were scheduled. Dates were sent to potential participants to choose a convenient date and time.

The researcher obtained informed consent from the participants before the interviews. The interviews were conducted in the labour ward in a private room which was comfortable and without interruptions. Conducting face-to-face interviews enabled the researcher to read and interpret non-verbal messages by observing participants' body language, expression and tone of voice and maintaining eye contact (Thseen, 2020:3). The researcher asked the participants to describe the challenges they experienced when taking care of ventilated women in a labour ward at the public hospital. The participants were interviewed during their lunchtime or on their off days at a time convenient to them. Each interview took between 30 and 45 minutes. Using open-ended questions allowed the participants to give thorough and detailed responses about

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their experiences, problems, and perceptions. The interviews were audio-recorded with the participant's consent (see Annexure B).

Semi-structured interviews were conducted until data saturation was reached and no new information emerged (Hennink, Kaiser and Marconi, 2016:592). In this study, data saturation was reached at participant number 12.

3.2.2.5 Bias

Bias can affect research findings. Biases are prejudices that develop as a result of structural mistakes in social research, which can happen at any point in the process, including data collection, literature analysis, and the research (Borowska-Beszta, 2017:56). The researcher used bracketing to eliminate bias. Bracketing is the process of detecting and setting aside previous assumptions and attitudes about the topic being studied (Brink and van Rensburg, 2022:124).

To reduce bias during data collection, the researcher:

- Adopted a transparent and reflective approach during the study, including data collection and analysis, and report writing.
- Bracketed previous notions about the challenges midwives experience caring for mechanically ventilated women in the labour ward of the selected hospital.
- Asked no leading questions during the interviews but used probing questions to gain a clear understanding of the phenomenon.

3.2.2.6 Data analysis

The data from the interviews were analysed using thematic analysis. Thematic analysis is the process of creating themes by coding qualitative data (Dawadi, 2020:62).

Data analysis is the systematic organization and synthesis of data to give order, structure and meaning to qualitative data collected (Polit and Beck, 2017:530). Data analysis entails categorising, ordering, manipulating, summarising and describing the data in meaningful terms (Brink and van Rensburg, 2022:55). Data analysis commences with data organisation. Qualitative data analysis involves examining non-numerical text, such as written material, video recordings, audio recordings, drawings, and photographs, rather than the numbers considered in quantitative studies (Brink and van Rensburg, 2022:206-208). The researcher used a five-step data analysis approach:

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- Assemble and arrange information

The researcher collected printed transcripts of the interviews.

- Examine and study the information

The researcher immersed herself in the data by reading the transcripts of the interviews several times. The researcher jotted down words, phrases and insights.

- Produce the first codes

The researcher made use of idea maps, sticky notes and highlighters to connect important words and phrases and made notes in the margins to help with categorization and coding.

- Examine the codes, make revisions, and determine themes

The researcher linked ideas and codes and identified recurrent themes.

- Present topics in a coherent way

The researcher linked related codes and themes into topics in order to achieve the goal of the study and tell the narrative. The researcher ensured the categories were saturated and mutually exclusive presented (Ravindran, 2019:44).

The researcher reached a consensus with the independent coder on the themes and subthemes and presented the findings in Chapter 4.

3.3 TRUSTWORTHINESS

Trustworthiness refers to the degree of confidence that qualitative researchers have in their data (Stahl and King, 2020:26), using the strategies of credibility, dependability, confirmability, and transferability (Stahl and King, 2020:26–28). Trustworthiness is the employment of procedures to ensure the accuracy of research findings by showing how the interpretations of

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the data and conclusions drawn reflect participants' experiences (Stahl and King, 2020:26–28).

3.3.1 Credibility

Credibility refers to how confident the qualitative researcher is in the truth and interpretation of the data (Polit and Beck, 2017:559). The researcher ensured prolonged engagement in the face-to-face interviews, which lasted between 45 and 60 minutes, and observed the participants' behaviours. The interviews were audio-recorded so that no information was left out. Data saturation was achieved when no new information emerged from the data and all relevant conceptual categories had been identified and investigated (Polit and Beck, 2017:561). The researcher continued with five more interviews after data saturation was reached.

3.3.2 Transferability

Transferability refers to the extent to which findings can be transferred to or have applicability in other settings or groups (Polit and Beck, 2017:560). In this study, transferability was not intended, as the study was conducted in one selected hospital in one province of South Africa. However, the researcher described the research process and context to promote transferability. In addition, the purposive selection of participants with sufficient knowledge of the phenomenon under study promoted transferability (Polit and Beck, 2017:560).

3.3.3 Confirmability

Confirmability is a criterion for integrity and neutrality in qualitative research and refers to the objectivity of the findings, which means that the data represent the information that the participants provided and that the researcher has not manipulated the interpretations of the data (Polit and Beck, 2017:559). The researcher must ensure that the data is intersubjective. The interpretation should be based on the evidence rather than personal likes and beliefs. Confirmability was ensured by using an experienced researcher who was not involved during data collection to do independent coding of the data and evaluate the accuracy of the data. The supervisors also checked if the information, such as population and sampling methods, was described.

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3.3.4 Dependability

Polit and Beck (2017:559) describe dependability as the stability of data over time and conditions. The research findings will remain unchanged should the study be repeated in different settings with different participants. In this study, the researcher used data triangulation to establish dependability. According to Brink and Van Rensburg (2022:131), the researcher must verify that the analysis procedure adheres to the recognized design requirements. An experienced researcher reviewed the methodology and checked whether the data was analysed correctly. To establish dependability, verbatim transcripts of the interviews were sent to an independent coder for verification of the findings (Brink and Van Rensburg, 2022:207).

3.3.5 Authenticity

Authenticity refers to the degree to which researchers faithfully and fairly show a range of realities. Authenticity expresses the tone of the participants' lived experiences and fairly describes their experiences so that it is a genuine reflection of their realities, perceptions, and experiences (Polit and Beck, 2017:560). Researchers strive to conduct research that is well designed in order to generate well-founded and trustworthy evidence. In this study, the researcher was open and thorough, kept field notes and transcribed audio-recorded data, and provided participants' direct quotations for readers to read and understand.

3.4 ETHICAL CONSIDERATIONS

Ethics deals with matters of right and wrong. When humans are used as study participants, care must be taken to ensure that their wellbeing and rights are protected (Polit and Beck, 2017:139–141; Afrin, 2018:30). Accordingly, the researcher obtained permission to conduct the study, obtained informed consent from the participants, and observed the ethical principles of beneficence, respect for human dignity, and justice (Polit and Beck, 2017:139). The researcher obtained ethical clearance and permission to conduct the study from the Ethics Committee of the Faculty of Health Sciences, University of Pretoria, the National Department of Health, and the selected hospital, and upheld the ethical principles of autonomy (informed consent), privacy, confidentiality, and beneficence during the study.

3.4.1 Approval and permission

The researcher obtained approval and permission to conduct the study from the Research Ethics Committee of the Faculty of Health Sciences ethical clearance number: 51/2022, University of Pretoria (see Annexure B) and from the CEO and labour ward unit managers of the selected hospital, as well as the Ekurhuleni Health District ethics committee.

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3.4.2 Autonomy and informed consent

The principle of respect for human dignity refers to participants' autonomy and right to self-determination, which means that participants have the right to decide whether to participate or not in the study (Brink and Van Rensburg, 2022:35). Before conducting the interviews, the researcher explained the purpose and significance of the study and informed the participants that participation was voluntary and that they could withdraw from the study at any time should they wish to do so. The researcher explained that all information (data) would be kept confidentially under lock and key and available only to the researcher and her supervisors (Brink, van der Walt, and Van Rensburg, 2018:31–34). The participants were allowed to ask any questions they had before signing informed consent (see Annexure B). The participants gave voluntary informed consent and signed two consent forms: one for the participant and the other for the researcher.

3.4.3 Beneficence

The principle of beneficence refers to the researcher's duty to minimise harm and maximise benefits to the participants (Polit and Beck, 2017:139). The principle also stipulates that human research must aim to benefit participants (Brink and Van Rensburg, 2022:7). The researcher made sure the individuals were not subjected to any discomfort or suffering, whether it was social, psychological, emotional, or spiritual. The participants were not coerced to take part. Beneficence includes the following:

Freedom from harm and discomfort

The researcher weighed the psychological risks, including anxiety, depression, and guilt, and the advantages to the participants. The study had more benefits than risks, and the findings would contribute to improving care for ventilated women and training midwives in the provision of basic ventilation care.

Protection from exploitation

Participants were protected against exploitation by keeping all the information provided by them private (Barrow, Brannan, and Khandhar, 2020:3).

3.4.4 Justice

The principle of justice upholds participants' right to fair treatment (Polit and Beck, 2017:141). The researcher selected the participants purposefully based on the relevance of their

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information and experience, treated them fairly, and was not discriminatory towards them. There was no victimization or loss of benefits for individuals who declined to participate in the study. Only individuals who met the inclusion criteria were selected, which further ensured justice.

3.4.5 Confidentiality and privacy

The participants were assured that any information provided would remain confidential and private (Burns et al., 2018:170). The interviews were conducted in a private room with only the researcher and the participant present.

The researcher ensured that the study was minimally intrusive, respected the participants' privacy, and informed the participants that their data would be kept strictly confidential (Polit and Beck, 2017:141). Limiting unauthorized access to the data secures confidentiality. To avoid unauthorized access, all paper-based and audio-recorded data will be locked away for 15 years on a personal computer only accessible to the researcher.

3.4.6 Anonymity

Anonymity entails keeping information gathered from the participants and their identities private (Burns et al., 2017:170). In order to maintain the participants' privacy and anonymity, no names were used. By using pseudonyms, the researcher ensured that no connection could be made between the individual participants and the data.

3.5 CONCLUSION

This chapter describes the research design and methodology of the study, including the population, sample, data collection, trustworthiness, and ethical considerations. Chapter 4 discusses the data analysis, interpretation, and findings.

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CHAPTER 4: DISCUSSION OF FINDINGS AND LITERATURE CONTROL AND PRESENTATION

4.1 INTRODUCTION

Chapter 3 describes the research design and methodology. This chapter discusses the findings and literature review regarding the challenges midwives experienced while taking care of ventilated women in a standard labour ward in a selected public hospital in Ekurhuleni, Gauteng Province, South Africa. Data were collected after the COVID-19 pandemic.

4.2 PARTICIPANTS' DEMOGRAPHIC PROFILE

Thirteen midwives (N = 13) participated in the study. The participants' demographic profile included occupation, level of experience, and the unit or ward where they were employed. Nine of the participants were midwives and four were advanced midwife specialists, and their years of experience ranged between three and 40 years (see Table 4.1). The advanced midwife specialists worked in the labour ward high care area as shift leaders, and the midwives worked in the labour ward floor area and high care area, rotating on different days.

Table 4.1 Participants' demographic profile

Number	Occupation	Ward/unit employed	Level of experience in years
1	Midwife	Labour ward high care	40
2	Midwife	Labour ward floor	3
3	Advanced Midwife specialist	Labour ward high care	8
4	Advanced Midwife specialist	Labour ward high care	15
5	Midwife	Labour ward floor	8
6	Midwife	Labour ward care	12
7	Midwife	Labour ward floor	6
8	Midwife	Labour ward floor	7
9	Advanced Midwife specialist	Labour ward floor	13
10	Midwife	Labour ward floor	20
11	Advanced Midwife specialist	Labour ward high care	7

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12	Midwife	Labour ward	3
13	Midwife	Labour ward floor	5

4.3 THEMES AND SUBTHEMES

Seven themes and related subthemes emerged from the data. Table 4.2 lists the themes and sub-themes. The discussion of findings is evidenced by participants' quotations in italics, followed by relevant related literature findings.

Table 4.2 Themes and subthemes

Themes	Subthemes
1. Participants' experience of caring for ventilated women	1.1 Indications and care of ventilated women 1.2 Care through support from medical practitioners 1.3 Practitioner care through support from ICU nurses 1.4 Coping through support from ICU nurses
2. Participants' emotional experience	2.1 Feeling inadequate 2.2 Feeling tension and anxiety 2.3 Feeling exhausted
3. Participants' competency challenges	3.1 Inadequate knowledge and training 3.2 Inadequate experience and skills 3.3 Inadequate technical skills
4. Participants' medical-legal challenges	4.1 Midwife-related risks 4.2 women-related risks
5. Inter- and intra-professional challenges	5.1 Challenges to obtain help from ICU nurses 5.2 Medical practitioners' lack of availability 5.3 Medical practitioners' lack of competency
6. Healthcare system-related challenges	6.1 Inadequate equipment and infrastructure 6.2 Inadequate resources
7. Participants' recommendations for care for ventilated women	7.1 Capacitation of nurses 7.2 Ensure women access to ICU care

4.3.1 Theme 1: Participants' experiences of caring for ventilated women

The participants described their experiences of caring for ventilated women in four subthemes: 1.1 indications and care of ventilated women; 1.2 care through support from medical

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practitioners; 1.3 care through support from ICU nurses; and lastly, 1.4 coping through support from ICU nurses.

4.3.1.1 Sub-theme 1.1: Indications and care of ventilated women

The participants described their experiences caring for ventilated women, focusing on their indications and care. One of the participants provided care for a 36-week pregnant woman with pulmonary oedema who needed ventilation due to cardio-pulmonary complications. Another woman experienced severe breathing difficulties, being unable to maintain her saturation independently and using all accessory muscles to try and breathe independently.

The participants indicated that for ventilated women, they monitored vital signs, blood pressure, respiration, medication, and the woman's endotracheal tube secretions. Suctioning was necessary two to four hours a day, depending on the woman's condition. A woman was sedated to prevent restlessness and complications, and the foreign endotracheal tube necessitated suctioning. The woman's condition was monitored for any deterioration or improvement.

Please note: all the participants used the word patient, referring to women in this study, during interviews.
According to participants,

> ***P2**: Okay, the patient was a pulmonary oedema patient; she was pregnant at 36 weeks gestation, so she was not coping on oxygen, so she has to be ventilated, to be transferred to ICU.*
>
> ***P10**: … Due to complications of the labour ward, the patient had elevated BPs (elevated blood pressures) and while we were busy attending to the patient, the patient arrested. Then we had to resuscitate. And then finally the doctors, according to the outcome of the blood gases, found out that the patient needs to be ventilated.*
>
> ***P12**: …. Patient was having severe difficulty in breathing. Patient could not maintain saturation on her own. Mm, patient was using all the accessory muscles to try and breathe by herself, so I was doing hourly observation. You're doing BPs, respiration, because the patient was in high care, intake and output. Mm, looking at the saturation. You're continuing with medication as prescribed and you're watching for any deterioration or any improvement,*

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and you report to the doctor as required. And then you record your findings now and then, it's mostly hourly observation and close monitoring, so you're mostly there with the patient.

***P13**: So usually with your ventilated patients, it isn't that they have a foreign airway. Yes, they build up a lot of secretions. So the main thing that we know we are supposed to do is suctioning the patient. Suctioning will depend on how much secretions the patient is producing or the condition of the patient. So if the patient is not producing a lot of secretions then maybe it's going to be like two-hourly or four-hourly secretions, depending on each patient and you know the patient is not functional and the patient will be sedated, because if the patient wakes up they might pull out the tube. Or something might happen. So the patient needs to be done two-hourly turnings. So we know for the prevention of pressure sores and things like that…*

***P4**: Yooh, after being left with the patient, truly speaking, my duty was to monitor the vital signs, that's what I knew, if the vital signs are within normal range that's what I understand, saturation...*

***P7**: We did blood pressure, the vital signs actually…*

One well-known side effect of preeclampsia is acute pulmonary oedema, which raises the risk of morbidity and mortality in both the mother and the foetus. Up to 2.9% of women with preeclampsia and 30% of women may experience it before delivery. It is the leading cause of death in hypertensive pregnant women and a common reason for admission to the ICU (Tayde et al., 2018:15).

The treatment for acute pulmonary oedema also depends on the underlying illness and the degree of hypoxemia. More oxygen and haemodynamic optimization are part of the first treatment, which lowers the left ventricular preload and afterload. The use of diuretics, vasodilators, and positive pressure breathing can accomplish this (Tayde et al., 2018:15–16). The participants monitored the women's vital signs, blood pressure, and respiration while monitoring their medication and monitoring for any deterioration or improvement. Vital signs are crucial in identifying individuals who are at risk of deteriorating in emergency rooms and hospital wards (Idar et al., 2019:1).

In this study, a woman's foreign endotracheal tube had secretions that necessitated suctioning, which could be two to four-hourly depending on the woman's condition. The woman was sedated to prevent her from being restless and extubating herself and other complications.

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Chatwin et al. (2018:99) state that because the patient's capacity to swallow, cough, and expel secretions may be impaired, the majority of patients with an artificial airway require suctioning to maintain airway patency. Additionally, because the artificial airway is a foreign item, it causes more secretions to be produced. The endotracheal tube in the patient's throat is painful and uncomfortable, and if the patient is restless or fighting the tube or the vent, it will make it much more difficult to control the different ventilation and oxygenation parameters (Mora Carpio and Mora, 2022:3).

4.3.1.2 Subtheme 1.2: Care through support from medical practitioners

The second subtheme was the participants' experiences caring for ventilated women, focusing on the support provided by medical practitioners. The participants indicated that they did not have experience with the ventilator but on one occasion, in order for the intubation to be successful for the women, the labour ward doctor had to call the anaesthetist from theatre, and they successfully intubated the women and taught the midwives how to monitor the ventilator machine.

According to participants,

> ***P4**: Okay, we were with the doctor, it was a male doctor, he even called anaesthetist from theatre.*
>
> ***P10**: It is a challenge, you know, to ventilate a patient, to intubate. Most of the time the doctors are intubating, we assist by giving the doctors whatever they call for, like the endotracheal tubes, the adrenalines and stuff like that, so the experience is good.*
>
> ***P12**: Jah, so the patient could not really breathe on her own, mm we called the doctor, because the patient had to be intubated and ventilated stat. … the process was a good learning experience.*
>
> ***P13**: …usually the doctor will call the physician who is really based in ICU, who will assist the patient and say, "Okay, these are the settings the patient needs to be on, or even with ventilating itself the doctor from the physician will be the one who ventilates the patient.*

The participants shared their experiences of a woman who became critically ill in the labour ward. The experience was challenging, but the participants provided the necessary support and equipment to the medical practitioner, such as endotracheal tubes and adrenaline, and all the equipment required to intubate the women.

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According to Spijkerman (2021:13), in a perfect world, the role of anaesthetists is to take advantage of every chance to teach their colleagues. According to Mora and Mora (2019:2), a few steps need to be completed before starting mechanical ventilation. The endotracheal tube's correct placement needs to be confirmed. End-tidal capnography, or a mix of radiological and clinical observations, may be used to achieve this. Fluids or vasopressors should be used as indicated on an individual basis to guarantee proper cardiovascular support and make sure the right analgesics and sedatives are at hand.

4.3.1.3 Subtheme 1.3: Care through support from ICU nurses

The third sub-theme was the participants' experiences of caring for mechanically ventilated women, focusing on the support provided by ICU nurses. The participants stated that they were unfamiliar with the ventilator. They indicated how the ICU nurses supported them so that they could provide care to women. The participants also indicated how the instructions they were given helped maintain the woman's condition. The ICU nurses suggested that the women be given muscle relaxers to help relax muscles, which led to their improvement in one example provided.

According to participants,

> ***P1**: But this sister from ICU suggested that the patient should be given muscle relaxers, so that it can help all the muscles relax.*
>
> **Interviewer:** *Yes, so what happened to the patient?"*
>
> ***P1**: So this patient had a, the patient was de-saturating, so the doctors were happy that the patient is improving after being given muscle relaxant.*
>
> ***P4**: The trained ICU sisters were called; so that they can do the settings of machine, as I don't have any knowledge of what is happening in the machine.*
>
> ***P7**: … even the sisters from ICU were helping us.*
>
> ***P8**: …she came, the sister from ICU came and connected the ventilator because I did not know anything about the machine, not even where to switch it on… Nobody knew. That's why I was nursing the patient via my phone to the sister in ICU.*
>
> ***P8:** At the end of the shift, knowing that the patient had survived the day and I managed to hand the patient over to the sister in ICU who came for overtime, made me feel much better.*

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***P13**: …and they usually will call ICU sisters as well who'll then say, "These are the settings the patient needs to be on. This is what you should press, this is what you should do, this is how you need to maintain the patient."*

Muscle relaxants help lessen ventilator-associated lung injury in acute respiratory distress patients (Wu et al., 2021:2).

4.3.1.4 Subtheme 1.4: Coping through support from ICU nurses

This subtheme discusses the participants' experiences of caring for ventilated women, highlighting the importance of seeking support from ICU nurses. The participants indicated the need to call ICU nurses for assistance, as they were not familiar with the settings of the ventilator machine. Overall, the participants found it essential to seek support from ICU nurses when caring for ventilated women. For nurses and midwives to effectively manage the emotional demands of providing healthcare, they depend on the support of their co-workers.

According to participants,

***P2:** Because we have a lack of skills with ventilation in our ward, we had to call sisters from the main ICU to come and assist us with the machine itself and the settings.*

***P8**: I was nursing the patient being nursed by a sister in ICU via my cell phone, so when I saw something that I do not understand, I will call the sister in ICU and then she will tell me that press there and reduce this…*

***P12**: … We had to call the sister from the ICU because we were not very familiar with the settings of the ventilator machine. So one sister had to come down and make the setting for us and that's when we proceeded with the intubation after the sister from ICU was here.*

***P13:** … So we usually ask ICU sisters, who are trained, to come and set the machine for us and give us directions on how to wean up or wean down the patient.*

The degree and quality of social support, whether perceived or received, influence how the emotional demands of providing healthcare affect employees' attitudes about their jobs (Lartey et al., 2020:9). Successful critical care delivery cannot be achieved by any one professional discipline acting alone. Therefore, intra- and multi-disciplinary teamwork, planning, and communicating are crucial (Lww.com, 2019).

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4.3.2 Theme 2: Participants' emotional experiences

This theme explored the participants' experiences caring for ventilated women and their emotional experiences. Three sub-themes emerged from this theme: 2.1 Feeling inadequate, 2.2 Feeling tension and anxiety, and 2.3 Feeling overwhelmed.

4.3.2.1 Subtheme 2.1: Feeling inadequate

The participants expressed frustration, feeling inadequate, and being unsure of their skills. They wanted the women to progress but were unable to obtain training. They felt uncomfortable taking care of mechanically ventilated women due to a lack of staffing and in-service training. The participants also indicated that they felt as if they failed the women, and this affected their self-confidence.

According to participants,

> ***P1****: So it makes nurses feel inadequate.*
>
> ***P7:*** *I feel so bad, because I want the patient to progress. I am feeling so bad because I would like to know, I want to know that machine. Unfortunately, we don't go for training, so the problem is I want to see the progress of the patient.*
>
> ***P11:*** *Like really, I don't feel comfortable taking care of mechanically ventilated patients because I feel like, I don't know what I am doing. I feel like I don't even have skills, I'm not competent. I start to doubt myself about my nursing skills, and it's not like I don't know anything, it's because we are not trained, and we spend most of the time in the labour ward.*
>
> ***P12:*** *To be honest, it makes me feel uncomfortable. One, because we don't have enough staff. Two, because we are not getting enough in-service training on it, so I am not very confident. Already I am not doing right by my patient, I am failing my patient.*
>
> ***P13:*** *…so we don't have experience with patients, we are not necessarily confident with what we are doing.*

The midwifery profession is among the most stressful occupations due to the challenges of supporting mothers dealing with pain, managing unpredictable maternal and/or neonatal emergencies, providing emotional care to women in the transition to motherhood, and competently performing a range of clinical procedures (Mohammad et al., 2022:1).

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4.3.2.2 Subtheme 2.2: Feeling tension and anxiety

The participants often experienced tension and anxiety when caring for women on ventilators. They felt uneasy and nervous as they were not providing proper care to the women. They were worried about ignoring important interventions that could have saved the woman's life. The participants explained the feelings as panic, fear for the women's lives because of their lack of skills, feelings of incompetency, and feeling unsure of how to proceed.

According to participants,

> ***P2:*** *I am not comfortable with it at all. It makes me nervous because I feel like the patients are not getting the proper care that they should be getting.*
>
> ***P3:*** *It frustrates me. It just makes me feel anxious because that's what I'm saying. I guess I mentioned regarding the alarms, you don't know what to do and sometimes I just feel like: what if I am ignoring something that is important that is going to save a patient's life? The worst feeling is that I am always anxious and need to run around asking people because I'm not like properly trained in nursing a patient on a ventilator.*
>
> ***P5:*** *We wait for them. By that time we will be doing chest compressions and giving oxygen and then panicking because we don't know what will happen to the patient.*
>
> ***P8:*** *… Not even having an insight of what it is that I am reducing and if I do reduce that thing, whatever is going to happen to the patient? So it was just a scary experiment, experience, but I did it, because I had to.*
>
> ***P8:*** *… That scared me because I didn't know whether I was doing good or bad and being helped by someone via a phone not even there in person to show me that touch here, reduce here and increase there, it was scary. It was just a scary experience for me.*

In a study on changes in anxiety and depression among public health workers during the COVID-19 pandemic response, Stone et al. (2023:1244) concluded that public health issues such as depression, anxiety, and stress have a detrimental effect on midwives' physical and mental well-being, their ability to provide high-quality care, and the satisfaction of women.

Midwives are prone to an increased risk of psychological distress, including anxiety, because the nature of their work is emotionally demanding (Mohammad et al., 2022:1-2). Emotional pressure is something midwives encounter, and it may have an impact on their general health, leading to depression, anxiety, and burnout (Båtsman, Fahlbeck, and Hildingsson, 2020:6-7).

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4.3.2.3 Subtheme 2.3: Feeling overwhelmed

Midwives often experience emotional distress and depression due to feeling overwhelmed and drained (Båtsman, Fahlbeck and Hildingsson, 2020; Lartey et al., 2020; Mohammad et al., 2022). The participants felt like they were in the dark and not confident in their profession. They felt overwhelmed because of a lack of knowledge and being aware of the risk inadequate interventions might hold for the mother and baby.

According to participants,

> ***P4:*** *It made me feel depressed; it is way too much.*
>
> ***P4:*** *I felt overwhelmed, drained, exhausted.*
>
> ***P10:*** *So it is really overwhelming to nurse such a patient, especially in a normal setup.*
>
> ***P11:*** *… Like you are just in the dark, you don't know what you are doing, you're just in the dark.*
>
> ***P12:*** *It makes me sad in a way because it's also risky. You know, looking at your profession and life on its own, it is risky. You are dealing with the patient and you're not confident in what you are doing. It's not just a patient, it's a patient and it's a baby. It's actually two people at once. So it is overwhelming.*

In a study conducted in a resource-constrained setting, Mukuve and Nuuyoma (2023:4) found that nurses were emotionally and physically exhausted helping women on mechanical ventilation due to sleep deprivation and feelings of work overload. Lack of resources to assist their patients may cause stress and emotional discomfort (Kelly and Porr, 2018:1). Healthcare professionals deal with a wide range of health concerns, and the industry is a stressful environment. Healthcare professionals' mental well-being is often negatively impacted by the demanding nature of their work, leading to emotional exhaustion (Lartey et al., 2020:2).

4.3.3 Theme 3: Participants' competency challenges

Theme 3 had three sub-themes: 3.1 inadequate knowledge and training; 3.2 inadequate experience and skills; and 3.3 inadequate technical skills.

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4.3.3.1 Subtheme 3.1: Inadequate knowledge and training

The participants faced numerous challenges in their roles, including inadequate knowledge and training, the need for in-service training, and the need to adapt to the changing needs of their women. One of the main challenges was the connection of a ventilator, as they often needed to call nurses from the ICU to connect the ventilator. They also lacked in-service training on interpreting blood gas results and responding appropriately to changes in the woman's condition. Additionally, they were not trained to treat women on ventilators, as they were not trained in the ICU aspects of care.

According to participants,

P3: *Because even now, I couldn't say I can do it on my own because most of the time when somebody comes to set the ventilator, it's like everybody is in a hurry. You don't get time to get to learn how to do that…. All I can say is, when we were doing advanced midwifery, we just rotated and so, as I said, I can only do the basics like doing vitals…. suctioning, giving treatment.*

P4: *Yes, because, like I mentioned earlier, I am not ICU trained and then sometimes you have to change some prescribed intravenous (IV) fluids based on the blood gas results so you see we don't have any knowledge about those things, so that was my main challenge.*

P9: *Then again, these patients, there are tests that are run, and they shift… the potassium goes down, they are in metabolic acidosis and then you need to interpret the whole blood gas, change…and this does not require a doctor. The nurse must be competent enough to change the machine settings that are for the ventilator machine.*

P10: *So that is another challenge we face. So it is really a big challenge and, another thing, if you are nursing that patient that is on a ventilator, you don't know most of the things because we were not trained. A vent patient must be nursed by a sister that is trained on how to treat a patient on the ventilator, and the challenge is that we are not trained.*

P12: *I realized we do not get a lot of in-service training with ventilators, so even interpreting what is going on there was quite a challenge because we don't know what it means. We have just been given brief in-service training of 'this is what you should watch out for', but we are not sure if we are exactly doing the right thing or the wrong thing.*

In Addis Ababa, Ethiopia, Hassen et al. (2023:4-5) found poor knowledge of mechanical ventilators and ventilatory care practices among ICU nurses in selected public hospitals. When

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it came to caring for patients on mechanical ventilators, 58.9% of the nurses had inadequate practice. As team leaders, nurses need to be well-prepared to manage crises at any healthcare system level in an effective, informed, and organized way (Miranda, Alves Pereira-Junior and Mazzo, 2021:2).

4.3.3.2 Subtheme 3.2: Inadequate experience and skills

The participants lacked experience in setting up the ventilator machine, which was a significant challenge. Assessing ventilated women is also challenging, as it differs from midwives' routine assessments. The skills and equipment used on the ventilator machine are also crucial, as midwives must monitor vital signs and respond to alarms they do not know how to rectify or respond to. The participants found this challenging and could endanger pregnant women who present with something outside the participants' knowledge or routine care. Sometimes participants called the ICU nurses to assist them, but it was difficult to understand the nurses' telephonic explanations.

According to participants,

> ***P1:*** *But it is a challenge because as midwives we don't know those settings, because the person from ICU started by changing everything on the machine, so it is very important to understand the best move for this condition.*
>
> ***P5:*** *The main challenge is that ... ehhh ... the machine will alarm, there will be an alarm with red, and there is something like red. So we will not know what we are supposed to do. We will keep on asking the people with experience from ICU to tell them that the machine is alarming. Then they will say 'go back to the machine and check maybe there is PK or what ….' Then we go back to the machine, we check what is written there, come back and read it for them. Then they say 'go to the machine there is a certain button', but when we do that we will be scared of what if we are wrong to the patient? It becomes very difficult while we are waiting for them to tell us that the bed is ready.*
>
> ***P9:*** *And the most important is that, like I have indicated, you have to set the machine. The machine must be changed every time the patient's condition changes.*
>
> ***P9:*** *Now if the patient ventilation or the patient is de-saturating, you need to go and change ..., and I tell you that is not that easy or as simple as saying that you just press that button.*
>
> ***P10:*** *So when you are nursing that patient, you become overwhelmed. Yes, the alarms will go on to tell you that something is wrong, but when you run to the machine, you don't know*

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where to press because you were not given in-service training or you were not trained to nurse the patient.

P13: *As a midwife we are not exposed to working with patients who are mechanically ventilated every day, so is difficult with setting the machine, like at what level of ventilation a patient should be on. So we don't know those things.*

A study conducted in a rural public hospital indicated that poor medical care provision that calls into question a midwife's competency would usually involve an unacceptably low standard of professional performance that endangers women's lives (Magqadiyane, 2020:1040). This typically happens when midwives display a lack of competency in their procedure abilities, making it impossible for them to provide a woman with safe and effective practice. Magqadiyane (2020:1040-1041) states that competence in the ideal scenario is a combination of abilities to provide nursing care to a woman in order to attain and preserve optimal health from the start of her pregnancy through every stage of labour and delivery. If a midwife can integrate and use the information, judgment, attitudes, values, and skills needed to practice safely and ethically in a given job and situation, then that midwife is deemed competent.

4.3.3.3 Subtheme 3.3: Inadequate technical skills

The participants faced several competency challenges in their role as midwives. One of the main challenges is inadequate technical skills, as they may not know the settings for the ventilator or the purpose of the alarms. When the ventilator is already set, the nurse may not know where to start or press the button to increase or decrease the ventilation. This can lead to complications, and continuing to nurse the women without rectifying the mistake. The main challenge is the alarms, however, as this can be overwhelming and challenging, especially when the woman is de-saturating or the machine is beeping. In addition, midwives may not have been exposed to working with women who are mechanically ventilated daily, making it difficult to set the appropriate ventilation level.

According to participants,

P1: *But it is a challenge because as midwives we don't know those settings, because this person from ICU started by changing everything on the machine, so it is very important to understand this is the best move for this condition.*

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P2: *We were not coping with the patient because the machine kept on setting off alarms. We didn't know how to manage it, and we didn't know what the alarms were for.*

P3: *The other challenge is also when the ventilator is already set, now the patient is intubated. The other challenge that I have is that the machine every time will alarm and each and every time when the machine is alarming, I think it says to us: 'Can you just fix something?' Most of the time we don't even know where to start, where to press, where to increase or decrease. We just press what do we call this, we just switch off the alarm. But the problem persists and we continue nursing the patient while we never rectify the mistake that is required by the ventilator.*

P7: *… When the machine is beeping, that's the challenge, because we don't know how to set the machine, we don't know how to stop the machine, you don't know where to go.*

P9: *And the most importantly, like I have indicated, is that you have to set the machine. The machine must be changed every time the patient's condition changes. Now if the patient ventilation or the patient is desaturating, you need to go and change, and am telling you that is not that easier or as simple as one say that you just press that button.*

P10: *So, when you are nursing that patient you become overwhelmed. Yes, the alarms will go on to tell you that something is wrong, but when you run to the machine you don't know where to press because you were not given in-service training or you were not trained to nurse the patient.*

It is essential that nurses providing intensive care in South Africa obtain orientation and training to improve their knowledge and abilities because they are responsible for monitoring patients' devices and alarms. Furthermore, to guarantee that patients are treated effectively, the nurses must have a thorough awareness of clinical alarms (Ramlaul, Chironda and Brysiewicz, 2021:57).

4.3.4 Theme 4: Participants' medical-legal challenges

The theme discusses the challenges faced by the participants and nurses in terms of medical-legal risks to women with mechanically ventilated conditions. Two sub-themes emerged from this theme: 4.1 participant-related risks and 4.2 women-related risks.

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4.3.4.1 Subtheme 4.1: Participant-related risks

The participants indicated that they faced various challenges in their medical-legal roles, including the need to record women's information, use ICU charts, and focus on delivering women. They also faced risks with paperwork, using high-care books, and not being familiar with charts, and took risks with their professional positions and women's lives, as they might not provide quality care without experience. They could also be putting themselves in danger, as they were responsible for any negative consequences.

According to participants,

> ***P1:*** *But when you are going to do something, you don't know if you will be in trouble. And if you are in trouble, how are you going to come out? Then it becomes a problem.*
>
> ***P2:*** *With paperwork, yes, because we don't do their ICU chart, we don't know how to use ICU charts. We use our high care book, which is wrong because we are not recording everything that is needed for the patient.*
>
> ***P3:*** *Yeah, and the other thing is the chart. It's so big, and I am not familiar with that chart. Like where do we put what and where should we record the findings. …and most of the time we focus on those delivering women and forget to nurse the patient on the ventilator.*
>
> ***P5:*** *It's like I am taking risk with my profession or even taking a risk with the life of the patient because if we have this type of patient in the ward without experience, I mean we are not providing the quality care… And also, I am putting myself in danger because I have accepted to nurse this patient but I don't have experience, I don't know what to do so if anything happens there, I mean if anything bad happens to the patient, I will be responsible because I am the one taking care of the patient… Yes and then so that we can nurse patients … eh … without fear of losing our profession.*
>
> ***P11:*** *We don't even use those charts here in the labour ward. We are just nursing that patient as … eh eh … a normal patient in bed. We don't use it; I have never seen that form.*

Nurses' health and well-being are influenced by work demands, leading to increased medical errors and compromised patient safety (Melnyk et al., 2018:126–127). A nurse is required to maintain complete and accurate records of all nursing actions performed on the patient. Failure to do so is considered professional misconduct, for which the SANC may take disciplinary action against offending nurses (SANC, 2005).

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4.3.4.2 Subtheme 4.2: women-related risks

The participants indicated that they were not ICU-trained or experienced, which could lead to negligence and inadequate nursing care. Some women's conditions deteriorated and saturation levels decreased when they were in the ward instead of in the ICU, and the participants felt they were not adequately caring for the women due to their lack of knowledge and experience of the ventilator machine, bag-valve mask, and intubation procedures.

According to participants,

P1: *A patient was fighting against the ventilator, because the fact is that the patient is ventilated is to ease breathing. And if we left the patient for a long time, she would get tired and crash again, and that patient was already resuscitated twice. The saturation levels were below 80% so we put the patient into ventilation again. When we put the patient into ventilation the SATS were going up, but the patient was still breathing fast so now we had three doctors, and they suggested that we transfer the patient running, guess what? You know when you put the endotracheal tube in, you have to secure it properly. So, when we arrived there the patient was extubated, the tube was out.*

P3: *I think I should just mention the one that I saw … but it was so unfortunate. Like it was the worst one, the one we didn't expect which was death. Because it took time, I don't know even the ambubag, there was something wrong with the ambubag. So, I think if we had ventilated the patient in time, she would have survived.*

P4: *… But most of things on that machine, honestly speaking, I know nothing about, so you see I am putting the patient in danger… it contributes to negligence and provision of inadequate nursing care to the patient.*

P7: *The patient demised because the machine was beeping, we didn't know how to increase the volume, the PEEP whatever, we don't know about that thing.*

P13: *I feel as if the patients don't improve here because we are not looking after them how a patient should actually be looked after in a high care or ICU setting.*

P13*: So it's never going to be a situation where the patients actually improve while they are here. Only when they are stepped down from ICU, when they come back from ICU. Then you'll say that okay, the patient has improved. Because there are a lot of things going on where the patient has to go to ICU then there are inotropes to maintain their blood pressures (BPs) and pulse and those things. So I feel like the patients deteriorate more when they are in the ward.*

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According to Beane et al. (2022:3), settings with limited resources, staff, equipment, and infrastructure limitations are frequently given as obstacles to identifying and saving declining patients. Delays in identifying escalating patients' conditions can have disastrous consequences for patients and their families in low- and middle-income nations when access to critical care services and sophisticated interventions is restricted.

4.3.5 Theme 5: Inter- and intra-professional challenges

The theme discusses the participants' challenges in obtaining support from ICU nurses. Three sub-themes emerged from this theme: 5.1 challenges to obtaining support from ICU nurses; 5.2 medical practitioners' lack of availability; and 5.3 medical practitioners' lack of competency.

4.3.5.1 Subtheme 5.1: Challenges to obtain support from ICU nurses

The participants faced challenges in having a ventilated woman in a busy ward, as they needed to call for help and might not have the necessary staff. Additionally, participants received guidance from the ICU nurses telephonically because they had their own women to take care of. The constant calling for help from ICU nurses is counterproductive, wastes time, and causes confusion and delays in care.

According to participants,

P4: *We were continuously calling the staff from ICU. At some point they get irritated, because they have got other patients to take care of in their unit.*

P7: *The patient can crash again when she is in the ventilator. Our challenge is that we have to call a sister who is in ICU, and sometimes they refuse to come.*

P10: *Jah, so most of the time when we are ventilating, we call for sisters but it is a challenge because sometimes they are overflowing in ICU as well so they end up not coming up… Anyway that time the sister from ICU was busy there as well, and seeing that she was taken out of the ward that was busy, to come and help nurses like her, it was like a hell of a challenge, because she was not happy, and was grumpy. … So that is really one of the challenges of having a ventilated patient in this ward.*

P11: *ICU is very far and we need to call. Sometimes you find that we are wasting time, so let me rush and go to ICU. Then obviously you are no longer helping during the resuscitation, they need more hands, and you're focusing on calling the ICU nurse… Imagine having a shortage of staff and running to ICU, and even ICU will say they don't have a nurse available at that moment.*

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P13: *… And you don't really have someone there to guide you because the ICU sister cannot stay here, she has her own patients in ICU to take care of, so she is going to give you certain instructions. After that, you have to figure things out on your own, or you have to call the sister again to ask questions or things that you are struggling with, until a bed can become available for that patient.*

In Australia, Al-Shamaly (2021:18-19) indicated that ICU care is complex and demanding because nurses must provide high-demand care for critically sick patients while also managing a high work-life ratio, accountability, and fatality rate.

4.3.5.2 Subtheme 5.2: Medical practitioners' unavailability

The participants indicated that sometimes doctors were called to help but were not available. Sisters in the ICU were called to help, but they were busy, and once an anaesthetist was called but arrived late. The participants become desperate, feeling left on their own without support.

According to participants,

P1: *And the doctors were not in the mood, they wanted to give reports because they wanted to hand over in the morning. But we called the doctor to come and see that the patient was not improving. Everyone could see that the patient was breathing very fast and the machine alarm was loud so we tried to manoeuvre the alarms but doctors came. One of the challenges we have is doctors.*

P3: *Jah, they are there even though there are some cases where the doctor is not available, but most of the time we have the doctor in the labour ward so jah.*

P7: *We called a sister in ICU to come help us and another doctor, who didn't know this machine. So, we called doctors in ICU, but they said they were "busy".*

P10: *…there must be an anaesthetist, so on that fateful day it was difficult to get an anaesthetist. So the anaesthetist came but came late.*

For medical care, the vast majority of South Africans rely on the public healthcare system, which includes public clinics, hospitals, and medical institutions. The South African public health system is severely constrained, lacking in healthcare professionals, having inadequate leadership, and frequently allocating and utilizing scarce resources improperly (Maphumulo and Bhengu, 2019:2-3).

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4.3.5.3 Subtheme 5.3: Medical practitioners' lack of competency

Medical practitioners often lack competency in ventilating and intubation, leading to challenges in patient care. This lack of knowledge can cause problems when a patient is intubated, leading to complications in patient care and hindering the overall quality of care. Doctors also frequently rely on ICU nurses to do the ventilation procedures.

According to participants,

> ***P1:*** *So also our doctors don't know. We find one doctor sometimes that knows about ventilation, so it is really a challenge.*
>
> ***P5:*** *Our doctors don't know anything about ventilating or tubing so we have had lot of problems. We still have problems if we must ventilate a patient...*
>
> ***P5:*** *The ICU nurses are the ones doing the machine. Sometimes they do the tubing because some of the doctors don't know how to tube.*
>
> ***P8:*** *… The doctor that was on duty also did not know how to operate a ventilator.*
>
> ***P9:*** *You know, we do the ventilation with the doctors, but like I indicated earlier, it is also a challenge with the doctors, because they are also not critical care specialists.*
>
> ***P11:*** *They don't even know how to connect the ventilator because they will say, "Please go and call an ICU nurse to come and connect the ventilator for us." Obviously, if you are struggling to connect the ventilator, it means you don't know how to set pressures there, how to set whatever they are setting there? So they don't know.*

Management of mechanical ventilation is an important and complex aspect of caring for critically ill patients (Keller et al., 2019:389). When patients have respiratory failure, mechanical ventilation can save their lives, but it is complicated and demands quick thinking. Management strategies and technical operation of the ventilator are key skills for physicians. In their review, Keller et al. (2019:391) found that practising intensive care doctors did not know enough about mechanical ventilation, including evaluating ventilator waveforms for patient-ventilator desynchronise and did not follow low tidal volume ventilation regimens well enough for adult and paediatric patients with acute respiratory distress syndrome.

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Theme 6: Healthcare system-related challenges

The theme discusses health system-related challenges. Two sub-themes were derived from this theme: 6.1 inadequate equipment and infrastructure, and 6.2 inadequate human resources.

4.3.6.1 Subtheme 6.1: Inadequate equipment and infrastructure

The participants indicated that the ICU beds were often closed, forcing women to be intubated in the labour ward even though the infrastructure is not suitable for ventilated women. Overloaded departments like the ICU and high care units also struggled, causing women to remain in the ward and the participants to provide care until an ICU bed was open. Other challenges included inadequate medical supplies such as bag-valve masks.

According to participants,

> ***P3:*** *Because if we are busy with the ambubag and the one is not working, we have to run around and take another one. But I think if the vent was working and set that time, we should have intubated… Again, I think the challenge is also the infrastructure because it is not suitable to nurse a ventilated woman. For example, our labour ward sometimes becomes overcrowded with …. what we call 'delivery room'.*
>
> ***P4:*** *… And another thing, we don't have suppliers. Some of the equipment is broken and all those things put the patients' lives in danger.*
>
> ***P9:*** *I am not happy about the setting. First of all, because it is a delivery room; our high care is combined with a delivery area… because for us to have patients being intubated and nursed in our labour wards means we don't have beds, we don't have ICU beds.*
>
> ***P12:*** *All the other departments, like the ICU and high care, were also overloaded so the patient had to remain in the ward and we had to nurse the patient the whole night.*

It has become more difficult for South Africa to retain qualified medical personnel and supply the necessary medications due to a lack of investment in healthcare facilities and equipment (Human Rights Watch, 2020). In order to meet the increasing demand, South Africa must increase the amount of money it allocates to invest in the development of its infrastructure. Maphumulo and Bhengu (2019:5) emphasise that due to insufficient funding for medicine and equipment, adverse events occur due to preventable errors. Extended waiting times caused

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by a lack of human resources and inadequate record-keeping are additional issues that need to be addressed.

4.3.6.2 Subtheme 6.2: Inadequate human resources

The participants indicated that the labour ward faced challenges due to insufficient human resources. The shortages relate to advanced midwives and senior staff members who are experienced and can work independently. Additionally, the high number of women in the ward makes it difficult to allocate resources to care for ventilated women.

According to participants,

P2: *… And human resources I would say because ventilated patients need one-on-one care, and in the labour ward that's impossible.*

P3: *And the nurse ratio again, it's a big no… and shortage of staff. I think the nurse patient ratio because in ICU it is one on one, but with us it is still difficult because of the challenges like delivering woman vs ventilated patient.*

P4: *Nursing the patient that is ventilated requires my increased presence as a nurse next to the patient hence I still have other patients in the ward to take care of. Since I am the senior personnel on the shift, I am still going back to other patients who are not under my care because I am the one who is senior, I am the who has to supervise the sisters, to teach them some of the things.*

P10: *So, when the ward is busy on its own, you cannot be nursing a ventilated patient because you need to do continuous monitoring and check the abnormalities and intervene, when you are busy there. We are running short of midwives in this hospital… nursing a ventilated patient, in a normal ward like labour ward. Firstly, we don't have the resources, one of them being not enough midwives.*

P11: *Another challenge is when we get the ICU nurse, obviously the ICU nurse is not working in the labour ward, and the patient is here in the labour ward. So we have to allocate somebody to take care of that patient, but we are short staffed. We don't have anyone to go to nurse that patient specifically, because the midwife doesn't know what to do, so it's a waste of resources.*

P12: *… It was quite difficult because we were short staffed. And we don't have a lot of advanced midwives in the field… You don't have a lot of seniors in the ward, and we don't have advanced midwives, so we have to work with whatever we have… I think the main, the*

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core, problem is staff shortage. If we could have adequate staff things would be better, because now one sister has to stretch and look after a lot of patients.

In their review on challenges of quality improvement in the healthcare of South Africa post-apartheid, Maphumulo and Bhengu (2019:3-6) found unequal resource distribution, a leadership and management crisis, an increase in the prevalence of diseases, pull and push factors, and slow progress in restructuring the healthcare system, including strategies adopted by the government to enhance the quality of healthcare delivery.

An examination of chronic staff shortages in Africa's health systems, despite efforts to improve the workforce, attributed the shortages to factors such as inadequate training capacity, rapid population growth, international migration, weak governance, career changes, and poor retention (WHO | Regional Office for Africa, 2023). The WHO predicts the staff shortage will reach 6.1 million by 2030, a 45% increase from 2013 (WHO | Regional Office for Africa, 2023).

4.3.7 Theme 7: Participants' recommendations for care for ventilated women

This theme discusses the participants' recommendations for care for ventilated women. Two sub-themes emerged from this theme: 7.1 Capacitation of midwives and 7.2 Ensure women access to ICU care.

4.3.7.1 Subtheme 7.1: Capacitation of midwives

The participants maintained that more exposure to ventilators and being willing to learn were essential skills for midwives. They suggested that midwives should be allocated for ICU training and then work in the ICU for a couple of months to obtain clinical competency. This would help midwives become more confident in caring for ventilated women and ensure they are equipped to handle the unique challenges of their profession. The participants added that midwives must also be willing to learn and empower themselves to care for ventilated women.

According to participants,

P4: *I think they must take us to school for ICU training. After being trained, you need to go and work in ICU. So in future when there is a patient who needs ventilation and there is no ICU bed in the ICU unit, they can get me from the ICU to come to the labour ward to take*

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care of that patient. Not me going for training, then come back to work in labour ward. After 10 months of training when they give me ventilated patient, so I don't know anything.

P5: *An ICU course, we need to have a bit of ICU course, even though is not a critical course. But we need knowledge about this intubation so that if we have or come across a patient we know what to do, how to set the machine, to know what is going on with the patient.*

P8: *I wish, personally I wish that we could be taken for training, because the nursing patients with ventilators we cannot run away from … our high cares are so small so there will be a need for us to nurse these patients. We are not running away from it, but we need to be equipped. We need to be taken for training and after training we need to at least work in that environment so that it does not go out and we don't forget it, because just learning for a week about a ventilator and then not practising it is just a waste of time.*

P9: *So it is really a challenge where you feel like if you could at least have that training so that you can actually be equipped in terms of the skills that are required… For ICU patients, and then if patients are kept in the labour ward, so they need to at least take midwives for training, so that at least they equip them in terms of the knowledge and the skills.*

P13: *If your high care patients, your labour high care patients, are cared for by the advanced midwife, I suggest that if there is an advanced midwife then she needs to be given a certain period of months or time where she gets exposed to ICU patients so she actually goes to the ICU and knows how to take care of ventilated patients… So whether it is a training programme and the time is six months or something where the sister is actually in the unit and works in ICU and is exposed to the ICU setting.*

In-service training refers to routine training programmes designed to support staff members' ongoing professional growth while they are on duty carrying out their assigned nursing duties. Ongoing or in-service training is sometimes referred to as "staff in service," "on-the-job training," or simply "in service" and describes the accomplishments of the employees and the updating of competencies (Jooste, 2018:216).

Global studies on maternal fatalities have centred on the competence and assurance of midwives in their ability to deliver care (WHO, 2018). Midwives who are motivated and self-assured in their ability to provide care are essential for high-quality maternity and reproductive healthcare services. In Kenya, such midwifery-led services are linked to decreased maternal fatalities and improved health outcomes (Tallam, Kaura and Mash 2022:1).

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For all countries to reach Sustainable Development Goal 3 on health and well-being, the WHO estimates that the world will need an additional nine million nurses and midwives by the year 2030. Achieving health for all will depend on sufficient numbers of well-trained, educated, regulated, and well-supported nurses and midwives who receive pay and recognition commensurate with the services and quality of care that they provide.

4.3.7.2 Subtheme 7.2: Ensure women access to ICU care

The participants indicated that hospital management should make sure that labour ward nurses are properly trained, that there is a sufficient staffing ratio, and that the physical environment and appropriate equipment are ready to care for women on mechanical ventilation in the labour ward. The participants stated that there should be more ICU beds available, as it was better for the women to be taken to the ICU and nursed in the ICU. The participants suggested having ICU personnel in the labour ward to provide specialized care when needed. This approach would help address space limitations in the labour ward.

According to participants,

> ***P2:*** *In case we have patients that are ventilated, we make sure that they don't stay for long in labour ward. They stay for a short while. We need to get a bed in ICU then they must be transferred stat.*
>
> ***P9:*** *There should be more ICU beds. But I also suggest that since we have ICU patients in the labour ward and we don't have space, it would be good to have ICU people in the ward. We understand well that these patients belong to ICU, but it would really be a good suggestion to have ICU people in the labour ward, to look after these patients. Because those nurses have skills, and at the end of the day it's not like we are refusing… but the patients will not get proper or the specialized care. Then really having ICU on board if we cannot have beds, can't they take us for training, and then the ICU people can come and really help, and having ICU people in the labour ward would also help us.*
>
> ***P10:*** *It is better, in my view, if the patient can be taken to ICU and be nursed in ICU.*

The shortage of resources and the rising demand for ICU services present challenges for administrators and intensive care practitioners in Angola, Botswana, Mozambique, Namibia, South Africa, and other countries in Southern Africa (Joynt et al., 2019:1-2). ICU services are costly, and healthcare professionals in low- and middle-income nations constantly deal with

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the effects of scarce resources. Rationing and triage (prioritization) decisions are often required in Southern African countries due to critically limited resources, especially in the publicly funded health sector.

In Jeddah, Saudi Arabia, Wali et al. (2023:1) found that raising nurses' job satisfaction helped them stay in their current positions longer and provide patients with the best care possible. This was accomplished by addressing the causes of pressure and frustration at work (Wali et al., 2023:2).

4.4 CONCLUSION

This chapter discussed the data analysis, interpretation, and results of the study. The participant midwives indicated the challenges they experienced in caring for mechanically ventilated women in a labour ward of the selected public tertiary hospital. The results concurred with the findings of the literature reviewed. Chapter 5 summarises the findings, describes the limitations of the study, and makes recommendations for education, practice, and further research.

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CHAPTER 5: FINDINGS, LIMITATIONS, AND RECOMMENDATIONS

5.1 INTRODUCTION

This chapter concludes the study, briefly presents the findings, and limitations, and makes recommendations for nursing education, practice and further research.

5.2 AIM OF THE STUDY

The study aimed to explore and describe the challenges midwives experienced while taking care of ventilated women in a labour ward.

To achieve the aim, the study wished to answer the following question:
What challenges do midwives experience when taking care of ventilated women in a labour ward at a public hospital?

5.3 SUMMARY OF FINDINGS

The study examined the challenges experienced by midwives caring for mechanically ventilated women in the labour ward of the selected public tertiary hospital in Gauteng. The study found that the participant midwives had no skills in nursing mechanically ventilated women or operating the ventilator.

The following themes emerged from the data analysis: participants' experience of caring for mechanically ventilated women; emotional experiences; competency challenges; medical-legal challenges; inter- and intra-professional challenges; healthcare system-related challenges; and participants' recommendations for care for ventilated women.

5.3.1 Experience of caring for ventilated women

The participants cared for ventilated women by monitoring vital signs such as blood pressure and respiration. They administered medication and suctioned the woman's endotracheal tube secretions. They indicated that in caring, they relied on and received support from medical practitioners and from ICU nurses, and they coped through support from ICU nurses.

5.3.2 Emotional experiences

The participants' emotional experiences left them feeling inadequate. They experienced tension, anxiety, and overwhelming feelings. The midwives felt inadequate due to a lack of training, experience, and staffing, leading to frustration, unpreparedness, and doubts about

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their nursing skills, particularly in caring for mechanically ventilated women. Their tension and anxiety while caring for ventilated women were due to feeling uneasy, frustrated, and panicked about ignoring crucial interventions and the women's potential fate. Midwives often experience overwhelming emotional experiences, feeling depressed, drained, exhausted, and sad due to risky situations and their challenging roles in taking care of women and babies.

5.3.3 Competency challenges

The participants' competency challenges were due to inadequate knowledge, training, experience, diagnostic, and technical skills. The participants emphasized that they felt incompetent due to inadequate knowledge and training on ventilator machine connection, interpretation and decision-making, and support for ventilated women. They struggled with ventilator settings, alarms, and setting appropriate ventilation levels, which left them feeling they were providing inadequate care.

5.3.4 Medical-legal challenges

The participants identified nurse-related risks and woman-related risks as medical-legal challenges. These challenges included record-keeping, treating women as normal low-risk women in labour wards, emphasizing the importance of considering mechanical ventilation when a woman cannot maintain adequate oxygenation or ventilation, and providing care to mechanically ventilated women.

5.3.5 Inter- and intra-professional challenges

The participants indicated a lack of medical practitioners' availability and medical practitioners' lack of competency. On occasion, there was a lack of medical practitioner availability and late arrivals when needed in the labour ward. The participants also indicated that, on occasion, a medical practitioner did not know how to intubate women or operate ventilators, subsequently calling for an anaesthetist to do so.

5.3.6 Healthcare system-related challenges

Healthcare system-related challenges related to inadequate equipment and infrastructure and inadequate human resources. The participants indicated that the ICU's beds were often closed, forcing women to be intubated in the labour ward even though the infrastructure was not suitable for ventilated women. Overloaded departments like the ICU and high care units also struggled, causing women to remain in the ward and the participants to provide care until an

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ICU bed was open. Other challenges included inadequate medical equipment and supplies, such as bag-valve masks.

The participants indicated that the labour ward faced challenges due to insufficient human resources. The shortages relate to advanced midwives and senior staff members who are experienced and can work independently. Additionally, the high number of women in the ward made it difficult to allocate resources to care for ventilated women.

5.3.7 Participants' recommendations to care for ventilated women

The participants' recommendations for care for ventilated women included capacitation of midwives and ensuring women access to ICU care.

The participants maintained that more exposure to ventilators and being willing to learn were essential skills for midwives. They suggested that midwives be taken for ICU training, especially for nursing mechanically ventilated women, in postgraduate level by attending in-service training on a regular basis and then work in the ICU to gain clinical competence. This would help midwives to become more confident in caring for ventilated women and ensure they were equipped to handle the unique challenges of their profession. In addition, midwives must also be willing to learn and empower themselves to care for ventilated women.

The participants indicated that hospital management should make sure that labour ward nurses are properly trained, that there is a sufficient staffing ratio, and that the physical environment and appropriate equipment are ready to care for women on mechanical ventilation in the labour ward. Moreover, there should be more ICU beds available as it was better for the women to be taken to the ICU and nursed in the ICU. The participants suggested having ICU personnel in the labour ward to provide specialized care when needed. This approach would help address space limitations in the labour ward and ICU.

5.4 LIMITATIONS OF THE STUDY

The study was conducted in one labour ward unit of a selected tertiary public hospital in Tembisa, Ekurhuleni North, with a purposive sample of 13 participants. The use of purposive sampling to select participants for the study allows the results to only be generalized on a small scale to the target population of midwives who had challenges nursing ventilated women at that hospital. Therefore, the findings of the study cannot be generalized to the broader context or to the total population of midwives in the Ekurhuleni Health District and other areas of South Africa. Despite the limitations, the findings highlight challenges, midwives experience nursing

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ventilated women in a labour ward. Another limitation is that the researcher is not familiar with mechanically ventilating a woman.

5.5 RECOMMENDATIONS

Based on the findings, the researcher makes the following recommendations for nursing education, management, and further research.

5.5.1 Nursing education

The researcher recommends that nursing education institutions include ICU training for midwives caring for ventilated women in labour wards in the curriculum. Courses should also be developed and provided for ongoing, in-service training of midwives in caring for ventilated women. By completing an ICU course, midwives can better understand and care for ventilated women, ensuring they are equipped to assess, diagnose, and manage ventilated women effectively. Training on ventilators and related recordkeeping should be provided for staff regularly to ensure competence in operating ventilators and ensure proper functioning and accountability.

5.5.2 Nursing management

The researcher recommends that nursing managers plan for sufficient human resources and book staff members for overtime when needed in order to minimise staff shortages. In addition, doctors in the labour ward should also be trained for ICU and mechanical ventilation, especially setting and operating ventilators. Management should also make provision for emotional support for midwives to cope with the challenges of caring for and managing women on ventilation.

Management should consider the bigger picture and sufficiently plan for health care infrastructure, resources, staff allocation, and utilisation of healthcare resources to prevent overcrowding of facilities. It is the responsibility of healthcare managers to prevent nurses from being exposed to potential ethical and medical legal risks. Midwives exposed to intensive care responsibilities outside their scope of practice are being set up for potential litigation, yet they persist in not abandoning women and ensuring continuity of care. Management has a responsibility to assess and manage the situation to protect the integrity of nurses and ensure quality and safe midwifery care.

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5.5.3 Further research

Further research should be conducted on the following topics:

- An exploration of the challenges midwives experience while taking care of ventilated women in labour wards in public hospitals in the Ekurhuleni Health District (or Gauteng, Limpopo, or other provinces in South Africa).
- Medical practitioners' perceptions of caring for mechanically ventilated women in an obstetrics labour room.
- Managers' perspectives on the difficulties and factors affecting care for ventilated women in the labour ward.
- Participatory action research is used to design guidelines to manage the current situation illuminated by this research project.
- Also, the exploration and description of the challenges faced by ICU nurses providing advice and assistance to the labour ward may be beneficial.
- Further research: a multimethod design consisting of a review that will look at the global or sub-Saharan African perspective, a survey to assess the competency and knowledge of midwives in caring for mechanically ventilated women, followed by a qualitative component that may include both barriers and facilitators from the midwives' perspectives. Or looking at both the public and private hospitals.

5.6 CONCLUSION

This study explored the challenges midwives faced and experienced when caring for mechanically ventilated women in a labour ward of a public hospital in Gauteng. For midwives to render proper nursing care, all midwives who work with mechanically ventilated women should be trained. This involves training midwives on mechanical ventilator machine settings and nursing mechanically ventilated women. There should be early referrals of mechanically ventilated women to higher levels of care, like the ICU, where multidisciplinary levels of staff and treatment are available. The study provided insight into the challenges midwives experienced caring for mechanically ventilated women in a standard labour ward of a public tertiary hospital. Finally, the study made recommendations for nursing education, nursing management, and further research.

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ANNEXURE A: DECLARATION REGARDING PLAGIARISM

DECLARATION OF ORIGINALITY

UNIVERSITY OF PRETORIA

The Department of **Nursing Science** places great emphasis upon integrity and ethical conduct in the preparation of all written work submitted for academic evaluation. Academics teach you about referencing techniques and how to avoid plagiarism; it is your responsibility to act on this knowledge. If you are at any stage uncertain as to what is required, you should speak to your lecturer before any written work is submitted. You are guilty of plagiarism if you copy something from another author's work (e.g. a book, an article or a website) without Acknowledging the source and pass it off as your own. In effect you are stealing something that belongs to someone else.

This is not only the case when you copy work word-for-word (verbatim) but also when you submit someone else's work in a slightly altered form (Paraphrase) or use a line of argument without acknowledging it. Students who commit plagiarism will not be given any credit for plagiarised work. The matter may also be referred to the Disciplinary Committee (Students) for a ruling. Plagiarism is regarded as a serious contravention of the University's rules and can lead to expulsion from the University.

The declaration which follows must accompany all written work submitted while you are a student of the Department of **Nursing Science** No written work will be accepted unless the declaration has been Completed and submitted.

Full names and surname of student: **Nwanamidwa Ronewa Alletta**

Student number: **13096096**

Topic of work: **Challenges midwives experience caring for mechanically ventilated women in a labour ward of a public tertiary hospital**

Declaration

1. I understand what plagiarism is and am aware of the University's policy in this regard.
2. I declare that this research proposal is my own original work. Where other people's work has been used (either from a printed source, Internet or any other source), this has been properly acknowledged and referenced in accordance with departmental requirements.

Nwanamidwa R.A

SIGNATURE DATE: 2021-06-16

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ANNEXURE B: INFORMED CONSENT FORM

To interested participants

INTRODUCTION

You are being asked to participate in a research project. At the University of Pretoria, I am conducting research for a master's degree. This information is provided to assist you in deciding whether or not to join. You should fully understand the implications of participating in this study before agreeing to participate. If you have any questions that are not answered in this document, please contact us. You should not accept to participate unless you are entirely comfortable with all of the processes.

PURPOSE OF THIS STUDY

The aim of this study is to evaluate, explore the challenges midwives experience taking care of ventilated patients and gain a better understanding of the challenge's midwives experience taking care of ventilated patients in a standard labour ward in Gauteng Province, South Africa.

EXPLANATION OF PROCEDURES AND WHAT WILL BE EXPECTED FROM PARTICIPANTS.

This research entails answering a few questions about the challenges midwives experience taking care of ventilated patients in a standard labour ward in Gauteng Province, South Africa.

POSSIBLE RISKS AND DISCOMFORTS INVOLVED

There are no possible risks.

POSSIBLE BENEFITS OF THIS STUDY

Although you may not benefit directly. The study results may help to improve nursing care.

COMPENSATION

You will not be paid to take part in the study. There are no costs involved for you to be part of the study.

YOUR RIGHTS AS A RESEARCH PARTICIPANT

Your participation is entirely voluntary and you can refuse to participate or stop at any time without stating any reason, and no penalties will be imposed.

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ETHICS APPROVAL

This research proposal will be submitted to the Faculty of Health Sciences Research Ethics Committee, University of Pretoria, telephone numbers 012 356 3084 / 012 356 3085 in order to obtain written approval from the committee. The proposal study will be structured in accordance with the Declaration of Helsinki (last update: October 2013), which deals with the recommendations guiding doctors in biomedical research involving human/subjects. A copy of the Declaration may be obtained from the investigator should you wish to review it.

INFORMATION

If you have any questions concerning this study, you should contact my supervisor:
Prof M Yazbek, Cell: 082 576 3558.

CONFIDENTIALITY

All information obtained during the course of this study will be regarded as confidential. Each participant that is taking part will be provided with an alphanumeric coded number. This will ensure confidentiality of information so collected. Only the researcher will be able to identify you as participant. Results will be published or presented in such a fashion that patients remain unidentifiable. The hard copies of all your records will be kept in a locked facility in the Nursing department of the University of Pretoria.

CONSENT TO PARTICIPATE IN THIS STUDY

- I confirm that the person requesting my consent to take part in this study has told me about the nature and process, any risks or discomforts, and the benefits of the study.
- I have also received, read and understood the above written information about the study.
- I have had adequate time to ask questions and I have no objections to participate in this study.
- I am aware that the information obtained in the study, including personal details, will be anonymously processed and presented in the reporting of results.
- I am participating willingly.
- I have received a signed copy of this informed consent agreement.
- I give permission that the focus group can be recorded.

_____ _____

Participant's name (Please print) Date

_____ _____

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Participant's signature	Date
_____	_____
Researcher's name (Please print)	Date
_____	_____
Researcher's signature	Date

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ANNEXURE C: REQUEST LETTER FOR STUDY

LETTERS OF REQUEST

Permission to carry out a research study at your institution.

To: The manager

Permission to carry out a study research at a Tertiary hospital in Gauteng

Title of study: **Challenges midwives experience caring for mechanically ventilated women in a labour ward of a public tertiary hospital**

I am a master's student at the Department of Nursing Science at the University of Pretoria. Permission to conduct a study on the above issue at your institution is hereby requested. This study interviewed midwives who worked in labour wards with ventilated patients. I'd like to do this once they've given their permission. I plan to publish the study's findings in a professional journal. The participants' personal identities will be protected by providing each of them a random code number. I agree not to proceed with the study until I have received approval from the University of Pretoria's Faculty of Health Sciences Research Ethics Committee.

Yours sincerely
Signature: Nwanamidwa R

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ANNEXURE D: INTERVIEW GUIDE

The main concern

What are the main challenges you have been experiencing while nursing patients that are ventilated in the labour ward unit.

Inquiring (probing) questions

Can you tell me about your experience?

How did you deal with mechanically ventilating the patient?

How did taking care of the ventilated patient make you feel?

What can be done to improve the care of mechanically ventilated patients?

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ANNEXURE D1: EXAMPLE OF INTERVIEW

Participant 3

Interviewer: Eh, good morning, ma'am. How are you?

Participant: Good and you.

I'm doing gooood.

Interviewer: Mhhhhh I can see here you've already signed the consent, you've already given us the the written consent and also the verbal consent about the study,

Interviewer: Ehhh just take a quick reminder about the study, the topic of the study is challenges midwives experience caring for mechanically ventilated women in labour ward of public Tertiary Hospital, I can also see they've given consent that would be audio taping our discussion and thank you for that. And again thank you for participating in this study and you can call me the researcher then I'll call you participant number one.

Interviewer: Then just a quick reminder. Therefore, confidentiality purposes and we don't mention the names of the hospital, any patients or doctors.

Participant: That's alright

Interviewer: Thank you. do you allow us to proceed with the with the interview?

Participant: Yes mam

Interviewer: the questions

Participant: Yes mam we may proceed

Interviewer: Okay. Thank you. OK, if I may start. Eh what are the main challenges you have been experiencing while nursing patients that have ventilated in the Labour work unit. Before I start that, may I ask, are you a professional nurse, General Nurse, Midwest specialist, Basic midwife, a comserve?

Participant: am a midwife specialist

Interviewer: So you're an advanced midwife

Participant: yes

Interviewer: for how long have you been working in the labour area?

Participant: Eight years

Interviewer: 8 years, OK. In this labour ward or?

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Participant: in this labour ward

Interviewer: alright.

Participant: yes

Interviewer: OK. May I please repeat the question again? What are the main challenges have you been experiencing while nursing patients that are ventilated in the labour word unit? Like the main challenges.

Participant: I think number one. Uh, to set the ventilator. Most of the time we struggle is sitting the ventilator. We'll have to wait for somebody especially from ICU or any doctor to come set. But unfortunately sometimes we delay setting and then patient end up complicating.

Yeah and the other thing is the chart, it's so big, am not familiar to that chart like where do we put what.

Interviewer: So you're saying to me, I'm not orientated to how they say the ventilator,

Participant: No. because even now, I couldn't say I can do it on my own because most of the time when somebody comes set the ventilator, it's like everybody's in their hurry. You don't get time to get to learn how to do that. Yeah.

Interviewer: Alright. Are there any more challenges except ehh setting the ventilator?

Participant: The other challenge is also when the ventilator is already set, now the patient is intubated. The other challenge that I'm having the machine every time will alarm and each and every time when the machine is alarming, I think it says to us. Can you just fix something? Most of the time we don't even know where to start where to press where to increase or decrease. We just press what do we call this, what we call we just switch off the alarm. But the problem persist and we continue nursing the patient while we never rectify the mistake that inquired by the ventilator.

Interviewer: OK, I heard you said the patients end up complicating just because you don't know what's going on with the ventilator or

Participant: yes yes

Interviewer: there is delay in time for setting the ventilator, if I may ask what kind of complications? Did does the patients go to like what kind of complications are you referring to when you're saying patients end up complicating?

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Participant: I think I can just mention the one that I saw but it was so unfortunate, like it was the worst one, the one we didn't expect which was death.

Interviewer: Oh

Participant: because it took time like I don't know even the ambubag there was something wrong with the ambubag. So I think if we change ventilated the patient in time, I think she would have survived. Jah

Interviewer: You saying if there were, there were no delay,

Participant: yeeesss. Because if we are busy with the ambubag and the one it's not working, we have to run around, take another one. But I think if the vent was working and set that time we should have intubated. Like, yeah.

Interviewer: Alright, I do get you. May we proceed to the next question?

Participant: definitely

Interviewer: Thank you. Alright, tell me how? How have you dealt with taking care of ventilated patients, like in general the basics that you are doing to the patients that are ventilated?

Participant: Jah as normally hourly vitals that's what I have been doing, administering treatment, monitoring, intake, and umm. But most of the time for blood gas as nurses in labour ward or registered midwife we don't take blood to see to see what to replace and not what to replace so doctors will be taking bloods I don't know how often. Jah they will just order us to replace or not to replace, jah, that's what we've been doing. And then sectioning because sometimes secretions make the patient to desaturate, that's all I've been doing.

Interviewer: Alright, so when you're saying doctors be eh, changing or taking care of the patients and stuff. Are they readily available? Or

Participant: Jah they are there even though they are some cases where the doctor is not available, but most of the time we have the doctor in the labour ward so jah

Interviewer: Thank you. May I please proceed to the next question?

Participant: Yes, please.

Interviewer: Uh, tell me more. How taking care of ventilated patient in standard labour ward makes you feel like in general.

Participant: It frustrates me, It just makes me feel anxious because that's what am saying. I guess I mentioned on regarding the Alarms, you don't know what to do and sometimes I just

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feel like what if am ignoring Something that is important that is going to save patients life. Worst feeling is that am always anxious and need to run around ask people because I'm not like it properly trained in nursing a patient on a ventilator.

As again the challenge I think also the infrastructure it's not like suitable enough to nurse a ventilated woman for an example our labour ward sometimes it becomes overcrowded with uuhhhmm what we call delivery room and most of the time we focus on those delivering woman and forget to nurse patient on the ventilator

Interviewer: Yeah, Yes,

And the ratio, nurse ratio again, it's a big no.

Interviewer: Yeeesss

Participant: So jah

Interviewer: Are you trained to miss the ventilator or?

Participant: am not

Interviewer: Like in general, you don't. You're saying you don't know anything. About ventilator machine

Participant: I can just say when we were doing advanced midwifery we just rotated I can only do, as I said, the basics like doing vitals. Uhhhhmm suctioning, giving treatment. Jah majority of the stuff for ventilated patient heehh ehh. So the training was that like it's not like sufficient?

Interviewer: It wasn't enough?

Participant: For me to say I can do it on my own

Interviewer: Alright thank you I do understand.

Alright, we're almost done. Let's go to the last question.

Participant: yeeesss

Interviewer: mmmhhhhh what do you think can be done to improve like this whole situation that you're currently going through as midwife? In the labor ward.

Participant: eehhh as I mentioned, I think we need proper training that let it not be like I don't need less training. It must be properly done and must be assessed whether we can do that or not and again also the regarding the infrastructure

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Interviewer: yes

Participant: And shortage of Staff I think nurse patient ratio because in ICU is one on one but with us is still difficult because of those challenges I said like delivering woman vs ventilated patient. If they can hire more staff, take us to training and so must be assessed whether we can do that or not.

Interviewer: And if I may ask a question when you say less training, what are you referring to?

Participant: Like as I said if we were doing midwifery it was only a touch up by maybe let me say for a month maybe you're in ICU, and is not every day just few days

Interviewer: soooohhh

Participant: How about at least two or three month's course like more than that

Interviewer: Oh, you recommending some short courses?

Participant: Yeah, definitely. And you might get a certificate that shows like really you qualifying and you can nurse that patient.mmmhhhh

Interviewer: Okay I do get you. Is there anything you want to say or anything you want to ask me? Or anything you're suggesting.

Participant: My suggestion is that may this studies please be carried on, so the only wish Is that can they please be implemented, since we've been having so many researches but I doubt they implement, if it's possible I just want to know why is it hard for everything to be implemented so that we can save lives like we can nurse patients holistically

Interviewer: All right. Most of the times you know the implementation, as you said, the implementation part, the infrastructure, you know changing buildings changing like. The the the whole setting of this normal labour, is going to take years and years and years. But then. But then we can come up with plans. We can come up, we can come up with plans, you know, like what can we do or how can we? Change with. Whatever we have. As you was suggesting training and staff.

Interviewer: Thank you.

Participant: Thank you very much researcher.

Interviewer: Any other questions?

Participant: No, thank you very much.

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Interviewer: This marks the end of the interview. Then you're more than welcome. To ask questions anytime.

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ANNEXURE E: DECLARATION FOR THE STORAGE OF RESEARCH DATA AND/OR DOCUMENTS

I, the Principal Investigator(s), Nwanamidwa Ronewa Alletta.
Of the following trial/study titled, CHALLENGES MIDWIVES EXPERIENCE CARING FOR MECHANICALLY VENTILATED WOMEN IN A LABOUR WARD OF A PUBLIC TERTIARY HOSPITAL

Will be storing all the research data and/or documents referring to the above mentioned trial/study at the following address: ____DEPT OF NURSING SCIENCE, HW SNYMAN NORTH 8TH FLOOR, PRINSHOF CAMPUS, PRETORIA_____

I understand that the storage for the abovementioned data and/or documents must be maintained for a minimum of 15 years from the commencement of this trial/study.

START DATE OF TRIAL/STUDY: 2021 January
END DATE OF TRIAL/STUDY: 2024 January
UNTIL WHICH YEAR WILL DATA WILL BE STORED: 2039

Name: Nwanamidwa Ronewa Alletta
Signature: R.A Nwanamidwa
Date: 2023/12/15

Clinical Review & Education

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ANNEXURE F: DECLARATION OF HELSINKI

Special Communication

World Medical Association Declaration of Helsinki

Ethical Principles for Medical Research Involving Human Subjects

World Medical Association

Adopted by the 18th WMA General Assembly, Helsinki, Finland, June 1964, and amended by the: 29th WMA General Assembly, Tokyo, Japan, October 1975

35th WMA General Assembly, Venice, Italy, October 1983 41st WMA General Assembly, Hong Kong, September 1989

48th WMA General Assembly, Somerset West, Republic of South Africa, October 1996 52nd WMA General Assembly, Edinburgh, Scotland, October 2000

53rd WMA General Assembly, Washington, DC, USA, October 2002 (Note of Clarification added)

55th WMA General Assembly, Tokyo, Japan, October 2004 (Note of Clarification added)

59th WMA General Assembly, Seoul, Republic of Korea, October 2008 64th WMA General Assembly, Fortaleza, Brazil, October 2013

Preamble

1. The World Medical Association (WMA) has developed the Dec- laration of Helsinki as a statement of ethical principles for medi- cal research involving human subjects, including research on identifiable human material and data.

The Declaration is intended to be read as a whole and each of its constituent paragraphs should be applied with consider- ation of all other relevant paragraphs.

2. Consistent with the mandate of the WMA, the Declaration is ad- dressed primarily to physicians. The WMA encourages others who are involved in medical research involving human subjects to adopt these principles.

General Principles

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3. The Declaration of Geneva of the WMA binds the physician with the words, “The health of my patient will be my first consider- ation,” and the International Code of Medical Ethics declares that, “A physician shall act in the patient's best interest when provid- ing medical care.”

4. It is the duty of the physician to promote and safeguard the health, well-being and rights of patients, including those who are involved in medical research. The physician's knowledge and con- science are dedicated to the fulfilment of this duty.

5. Medical progress is based on research that ultimately must in- clude studies involving human subjects.

6. The primary purpose of medical research involving human sub- jects is to understand the causes, development and effects of diseases and improve preventive, diagnostic and therapeutic in- terventions (methods, procedures and treatments). Even the

best proven interventions must be evaluated continually through research for their safety, effectiveness, efficiency, accessibility and quality.

7. Medical research is subject to ethical standards that promote and ensure respect for all human subjects and protect their health and rights.

8. While the primary purpose of medical research is to generate new knowledge, this goal can never take precedence over the rights and interests of individual research subjects.

9. It is the duty of physicians who are involved in medical research to protect the life, health, dignity, integrity, right to self- determination, privacy, and confidentiality of personal informa- tion of research subjects. The responsibility for the protection of research subjects must always rest with the physician or other health care professionals and never with the research subjects, even though they have given consent.

10. Physicians must consider the ethical, legal and regulatory norms and standards for research involving human subjects in their own countries as well as applicable international norms and stan- dards. No national or international ethical, legal or regulatory re- quirement should reduce or eliminate any of the protections for research subjects set forth in this Declaration.

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11. Medical research should be conducted in a manner that mini- mises possible harm to the environment.

12. Medical research involving human subjects must be conducted only by individuals with the appropriate ethics and scientific edu- cation, training and qualifications. Research on patients or healthy volunteers requires the supervision of a competent and appropriately qualified physician or other health care profes- sional.

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ANNEXURE G: INSTITUTIONAL APPROVAL

GAUTENG **PROVINCE**
REPDBLIC ICF SOUTH AFRICA

TEMBISA PROVINCIAL TERTIARY HOSPITAL
PR NO: 5602793
Cnr Flint Mazibuko Or & Rev N0mane, Olifantsfontien, 1665
Private Bag X07, O1ifantsfontein, 1665
Tel 011 923 2320
Enquiries: Dr A. Mthunzi
E-mail: Vusi.Mthunzi@gauteng.gov,za

To : **Ms Ronewa Alletta Nwanamidwa**

Subject : Permission to Conduct Research at Tembisa Provincial Tertiary Hospital Research Committee
From : Dr A Mthunzi, Chief Executive Officer, Tembisa Provincial Tertiary Hospital
Date : 17 May 2022

Ms Ronewa Alletta Nwanamidwa

This is to notify you that you have been granted permission to conduct research in our institution for the following study:

Study Title: "Challenges midwives experience caring for mechanically ventilated .women in a labour ward of a public Tertiary Hospital''.

NHRD Reference Number: GP_202204_018

Permission with the following restrictions:

- The study should not interfere with service provision.

Permission to conduct research as per study protocol
Please note the institution requires for all data collection and interaction with staff; patients or records to be.as outlined in the study protocol and within the constraints of ethics approval obtained for this *study.* Should *any* of these parameters or *professional* conduct be violated at any stage then the Tembisa Research Committee reserves the right to review and change the decision to allow the researcher to conduct research at the institution.

Please report to the undersigned chair of the Research Committee with all your documents on the first day at the institution for further instructions and introductions.

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Recommended by:
Dr M.K. Chueu
Rotating Chair of Tembisa Provincial Teniary Hospitaï Research Committee
Signature: _____
Date: /'î2 /OJ /vo1

Approved by:
Dr A. Mthuzizi
CEO, Tembisa Provincial Tertiary Hospital
Signature _____
Date: 29/05/2022

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ANNEXURE H: ETHICAL APPROVAL

The Research Ethics Committee, Faculty Health Sciences, University of Pretoria complies with ICH-GCP guidelines and has US Federal wide Assurance.
- FWA 00002567, Approved dd 18 March 2002 and Expires 18 March2027.
- IORG #: IORG0001762 OMB NO.0990-0278 Approved for use through August 31, 2023.

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Health Sciences Research Ethics Committee

23 March 2023

Approval Certificate
Annual Renewal

Ethics Reference No.: 51/2022 – Line 1

Title: **Challenges midwives experience caring for mechanically ventilated women in a labour ward of a public tertiary hospital**

Dear Miss RA Nwanamidwa

The **Annual Renewal** as supported by documents received between 2023-02/21 and 2023-03-15 for your research, was approved by the Faculty of Health Sciences Research Ethics Committee on 2023-03-15 as resolved by its quorate meeting.

Please note the following about your ethics approval:
- Renewal of ethics approval is valid for 1-year, subsequent annual renewal will become due on 2024-03-23.
- Please remember to use your protocol number (**51/2022**) on any documents or correspondence with the Research Ethics Committee regarding your research.
- Please note that the Research Ethics Committee may ask further questions, seek additional information, require further modification, monitor the conduct of your research, or suspend or withdraw ethics approval.

Ethics approval is subject to the following:
- The ethics approval is conditional on the research being conducted as stipulated by the details of all documents submitted to the Committee. In the event that a further need arises to change who the investigators are, the methods or any other aspect, such changes must be submitted as an Amendment for approval by the Committee.

We wish you the best with your research.

Yours sincerely

Dr R Sommers; MBChB; MMed (Int); MPharMed,PhD
Deputy Chairperson of the Faculty of Health Sciences Research Ethics Committee, University of Pretoria

The Faculty of Health Sciences Research Ethics Committee complies with the SA National Act 61 of 2003 as it pertains to health research and the United States Code of Federal Regulations Title 45 and 46. This committee abides by the ethical norms and principles for research, established by the Declaration of Helsinki, the South African Medical Research Council Guidelines as well as the Guidelines for Ethical Research: Principles Structures and Processes, Second Edition 2015 (Department of Health).

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ANNEXURE I: LETTER FROM THE EDITOR

Cell/Mobile: 073-782-3923

53 Glover Avenue
Doringkloof
0157 Centurion

29 February 2024

TO WHOM IT MAY CONCERN

I hereby certify that I have edited Ronewa Nwanamidwa's master's dissertation, **Challenges midwives experience caring for mechanically ventilated women in a labour ward of a public tertiary hospital**, for language and content.

IM Cooper
Iauma M Cooper
192-290-4

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ANNEXURE J: CODING CERTIFICATE

Dr Annatjie van der Wath (M Cur, PhD) annavdw@mweb.co.za

CODING CERTIFICATE

Qualitative Data Analysis

This serves to confirm that Annatjie van der Wath has co-coded the following qualitative data: 12 interviews for the study:

CHALLENGES MIDWIVES EXPERIENCE CARING FOR MECHANICALLY VENTILATED WOMEN IN A LABOUR WARD OF A PUBLIC TERTIARY HOSPITAL

I declare that the candidate, Nwanamidwa, Ronewa Alletta, and I have reached consensus on the major themes and categories as reflected in the findings during a consensus discussion.

Annatjie van der Wath (M Cur, Ph D) annavdw@mweb.co.za

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