Experiences and Perceptions of Non-intensive Care trained nurses in caring for patients on mechanical ventilators in Mahalapye District Hospital, Botswana

By

Gabarate Bohutsana

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DECLARATION

I, Gabarate Bohutsana declare that this dissertation hereby submitted for the award of the degree of Master of Science in Critical Care Nursing is my own work and has not been submitted either wholly or in part for another degree to this University or any other or to my institution of Higher learning.

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ABSTRACT

There is increasing patient acuity in Intensive Care Units (ICUs) in Botswana, with a growing demand for mechanical ventilation. As a result, non-intensive care-trained nurses are increasingly involved in caring for patients on mechanical ventilators in the ICUs. There seems to be little research on non-intensive care trained nurses' experiences and perceptions in caring for patients on mechanical ventilation in Botswana, yet they play a significant role in the care of ventilated patients. This poses a gap in understanding these nurses' specific experiences and perceptions in their roles in caring for patients on mechanical ventilators.

This study explored the experiences and perceptions of non-intensive care trained nurses caring for patients on mechanical ventilators in Mahalapye District Hospital in Botswana. A qualitative, descriptive phenomenological design was used in this study. The researcher purposively selected eight non-intensive trained nurses who had cared for patients on mechanical ventilators for at least one year. Data was collected through face-to-face interviews, transcribed verbatim, and analysed using thematic analysis following Braun and Clarke's (2006) six-step approach. Five major themes and eleven sub-themes emerged from this study. Theme one, emotional burden and exhaustion in caring for patients on mechanical ventilators, had a sub-theme: stress and burnout. Theme two, perceived lack of knowledge and learning on the job, had three sub-themes: knowledge and skill gaps in ventilator management; coping strategies employed for knowledge and skill development; and the need for training and professional development. Theme three is resource and organisational challenges, while theme four, support and teamwork in ventilated patient care delivery, had two sub-themes: support and collaboration, and challenges in collaboration. Theme five, positive perceptions of caring for ventilated patients and professional fulfilment, has two sub-themes.

Non-intensive care-trained nurses face challenges in caring for mechanically ventilated patients, including emotional distress, knowledge gaps, and resource limitations. Addressing these issues through targeted training, emotional support programmes and improved resource allocation is essential to enhancing the quality of nursing care for ventilated patients and could improve patient outcomes.

Keywords: Non-intensive care trained nurses, mechanical ventilation, Intensive care unit, experiences, perceptions, ventilated patient.

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DEDICATION

I dedicate this study to my beloved family, whose unwavering support, love, and encouragement have been my greatest source of strength. To my mother, for her sacrifices and endless belief in my abilities, and my brothers, for their constant motivation and companionship; and to my children for their patience, love and prayers which kept me strong. Thank you for your prayers and words of encouragement.

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LIST OF ABBREVIATIONS

ICS	Intensive Care Society
ICUs	Intensive care units
FICM	Faculty of Intensive Care Medicine
FiO2	Fraction of inspired oxygen
MDH	Mahalapye District Hospital
MV	Mechanical ventilation
NCDs	Non-communicable and communicable diseases
NHRA	National Health Research Committee
PEEP	Positive End Expiratory Pressure
PR	Physical restraint
SMH	Sekgoma Memorial District Hospital
VAP	Ventilator-associated pneumonia
UNZABREC	University of Zambia Biomedical Research Ethics Committee

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CHAPTER ONE

INTRODUCTION AND BACKGROUND

1.1 Introduction

The use of mechanical ventilation (MV) is an important intervention in the management of critically ill patients in intensive and critical care units (Sweity et al., 2022), and the role of nurses is crucial in the care of ventilated patients. Through various responsibilities and interventions, critical care nurses play a critical role in enhancing the effectiveness of mechanical ventilation, preventing harm, and optimizing patient outcomes (Hassen et al., 2023). As healthcare systems adapt to changing patient needs, such as increasing rates of chronic diseases like diabetes and hypertension, there is an increasing need for non-intensive care-trained nurses to care for critically ill patients in intensive care units (ICUs) on MV. These nurses are essential to the overall care of patients on ventilation, even in the absence of standard, specialized, longer-term training.

Non-intensive care training provides a unique opportunity to patients on MV by promoting accessibility and availability of the nursing care needed. To effectively plan for future provision of nursing care to patients on MV by non-intensive care trained nurses, the experiences and perceptions of these nurses towards caring for patients on MV must be known and understood. Lived experiences of non-intensive care training can be used to understand caring as an expression in nursing, especially when it comes to how such experiences represent the knowledge or skills that the individual has gained from exposure to that specific situation (Abdulkadir et al., 2022). As such, exploring the experiences and perceptions of these non-intensive care trained nurses in caring for patients on mechanical ventilation is important.

Based on my observations and experiences, most nurses working in ICUs in Botswana, particularly in the hospitals where I have worked, are not trained in intensive care and take part in providing care for patients on mechanical ventilation. This has inspired me to explore how these nurses view and experience caring for MV patients without specialised training in intensive care.

This chapter presents an overview of the study that encompasses an introduction, background information on the research problem, statement of the problem, study justification, purpose of the study, research questions, conceptual definitions, and operationalized definitions.

1.2 Background

Mechanical ventilation is one of the most common treatment modalities in the care of critically ill patients, and up to (90%) of patients globally require mechanical ventilation for all or a portion of their time in the intensive care unit (Frutos-vivar, 2017; Namadian et al., 2021). According to Guilhermino et al. (2018), one of the main reasons for ICU admissions is mechanical ventilation, and over the next ten years, it is anticipated that this intervention will become more common.

In developed countries, 2–3 million intensive care unit patients receive invasive mechanical ventilation per year at estimated costs of 15-27 billion dollars (Hassen et al., 2023). In the United States, half of ICU patients require MV, and (15%) of healthcare spending goes towards the expense of the care (Owens, 2018). Most of the patients receive MV, with older patients making up a major proportion (Ma et al., 2021). Furthermore, Nagata et al. (2019) reported that approximately 7.3% of MV patients in Japan required prolonged MV for more than 21 days. Similarly, a study conducted in Sweden reported that out of 39,510 ICU admissions, (4%) patients required mechanical ventilation for more than seven days, and (18%) patients required MV for more than 21 days (Cederwall et al., 2021). Bouza et al. (2021) reported that MV use increased by (3.4%) annually among adult patients in a study conducted in Spain on MV use in adults 65 years of age and older. Moreover, Zisk-Rony et al. (2019) reported that the number of ventilated patients in Israel increased from 31 patients per day to 67 patients per day in the last two decades. A study conducted in Nigeria by Tobi et al. (2017) reported that (34.4%) of patients in the ICU receive MV, with respiratory distress and airway protection being the main reasons for MV. Hunegnaw et al., (2022) in Ethiopia reported that the prevalence of mechanical ventilation among ICU admitted patients was (43.1%), while Mazwi et al. (2023) reported that in the public sector in South Africa, out of 1,185 ICU patients, the majority were mechanically ventilated. Botswana, like other sub-Saharan African countries, is experiencing an increase in non-communicable and communicable diseases (NCDs), which is causing a rise in critical illnesses and consequently need for MV.

The increase in the need for MV suggests that there is a rising need for ventilator support services, which implies more critical care nurses to provide care for ventilated patients. Trained critical care nurses, also known as intensive care nurses, play a crucial role in caring for patients on ventilation due to their specialized training, ventilator management expertise, and critical thinking skills (Chamberlain et al. 2017). According to recommendations made by the Intensive Care

Society (ICS) and the Faculty of Intensive Care Medicine (FICM), in order to provide direct care, ventilated patients should have a critical care nurse-to-patient ratio of at least 1:1. Some critically ill patients, such as unstable patients who require numerous simultaneous nursing tasks and sophisticated therapies used to maintain multiple organ failure, without use of MV, may require a nurse-to-patient ratio of 1:2 to safely meet their demands (FICM and ICS; Driscoll et al. 2018). The nurse-to-patient ratio is adhered to in high-income nations like Canada, the UK, Germany, and the United States and has even been made into law in some countries, including California, the United States, and Australia (Sharma & Rani, 2020; Driscoll et al., 2018). However, most ICUs worldwide do not frequently utilize the ratios (Nakweenda et al., 2022). In a study conducted in Iran, Babazadeh et al. (2021) reported a 1:4 nurse-to-patient ratio.

The lack of sufficient trained ICU nurses, financial limitations, and rising patient demands, among other factors, make it difficult to achieve the recommended nurse-to-patient ratio in Africa (Khan et al., 2019; Squires et al., 2017). Atumanya et al. (2020) reported a nurse-to-patient ratio of more than 1:2 in ICUs in Uganda. Similarly, Nakweenda et al. (2022) in Namibia reported a nurse-to-patient ratio of up to 1:4 in ICUs. To meet the recommended nurse-to-patient ratio of 1:1 or 1:2 in the ICU, different ICU nursing staffing approaches, such as a team nursing model, adjusting nursing staffing levels as needed, utilizing agency nurses, and deploying float nurses, are utilized (Nakweenda et al., 2022). ICU staffing models such as team nursing involve the allocation of non-intensive care trained nurses who also provide care for critically ill patients, including those on MV, to try to meet the recommended nurse-patient ratio.

Crawford et al., (2023) reports that there is a lack of nurses with critical care training as a result of the undervaluation of critical care on a worldwide scale. The shortage of nurses in critical care in sub-Saharan African countries is a result of several causes, including a lack of nursing schools, a lack of resources, and economic difficulties (Gutsan et al. 2018). Non-intensive care trained nurses perform several specialized duties which are almost the same as for critical care nurses, including paying attention to key aspects such as endotracheal tube management, monitoring of ventilator settings, and maintaining optimal oral hygiene (Juliana et al., 2021; Maddumage et al., 2017). They (non-intensive care trained nurses) also monitor and maintain endotracheal cuff pressure within the range of 20 to 30 cmH2O to prevent complications like aspiration and tracheal damage (Akdogan et al., 2017; Ziyaeifard et al., 2017). To optimize patient ventilation and oxygenation, non-intensive care trained nurses perform ongoing respiratory assessments and adjust ventilator settings according to the patient's needs (Assouline et al., 2023). Furthermore, non-intensive care trained nurses care for ventilator circuits by routinely cleaning and replacing them as needed to prevent infection (Santos et al., 2020). Oral hygiene, including the use of (0.12%) chlorhexidine, is conducted to minimise oral bacterial colonisation, thereby reducing the risk of ventilator-associated pneumonia (Cruz et al., 2023). Alongside these responsibilities, non-intensive care-trained nurses take care of patient positioning, maintaining a bedside elevation between 30° and 45° to prevent aspiration. Despite not having received standard specialized training in intensive care, non-intensive care trained nurses are oriented towards nursing care measures for ventilated patients, and they play an important role in ensuring the overall well-being of ventilated patients by integrating these various aspects of care into their practice in caring for ventilated patients.

Caring for critically ill, mechanically ventilated patients admitted to the Intensive Care Unit often brings forth many experiences and perceptions for the nurses. According to Limbu et al. (2019), ICU nurses perceived that in caring for ventilated patients, these nurses knew more about how to use a ventilator but felt incompetent when it came to using it. They expressed that to improve their proficiency in providing care for patients on ventilators, they needed training. Moreover, Akroute et al. (2022) reported that ICU nurses encountered difficulties as well as a sense of fulfillment in providing care for ventilated adult patients with tracheostomies. The study reported that trying to understand voiceless tracheostomy patients who are unable to vocally communicate their symptoms, levels of discomfort, or demands caused stress for ICU nurses. However, the study also reported that ICU nurses also expressed pride in caring for patients and that it was emotionally fulfilling, particularly when patients were discharged from the ICU. Being able to communicate with ventilated patients on tracheostomy allows ICU nurses to understand the patients' needs, take appropriate action, and contribute to positive patient outcomes. Engaging in communication and interactions with ventilated patients enhances nurses' sense of purpose and satisfaction in their role as they fulfill their professional responsibilities.

Olorunfemi et al. (2024), further asserted that ICU nurses reported that care for patients on a ventilator is difficult and stressful. According to the study, ICU nurses expressed feelings of nervousness and fear, especially when faced with the challenge of providing complex patient care for patients on MV. The ICU nurses reported that taking care of ventilated patients requires more work and attention to prevent potential complications like extubation, which could cause the patients to suffer hypoxemia, arrhythmias, and vocal tracheal injury. However, Mukuve and Nuuyoma (2023) reported that ICU nurses experienced feeling competent in caring for ventilated patients. The ICU nurses reported they have gained experience by learning from the guidance of doctors and specialized intensive care nurses. The study reported that the ICU nurses reported that they felt confident in recognising problems in ventilated patients and were able to manage them or notify the doctor. Despite reporting competence, the study reported that the ICU nurses reported that they needed training to enhance their knowledge and skills in caring for critically ill ventilated patients. This suggests that caring for patients on MV requires proper theoretical knowledge and skills is needed to be competent and knowledgeable, and be able to intervene in the nursing care

Most of the studies reviewed in the literature reported on intensive care nurses' experiences caring for patients on MV in the ICU. There seems to be little literature examining specifically the experiences and perceptions of non-intensive care trained nurses in caring for patients on MV to explore their subjective view in handling the responsibility of caring for patients who are on MV. Therefore, the objective of this study is to explore the experiences and perceptions of non-intensive care trained nurses while caring for patients on mechanical ventilators. The findings could help in supporting the development of strategies that enhance the quality of care provided to ventilated patients and optimize the role of non-intensive care trained nurses in Botswana.

1.3 Statement of the problem

There is increasing patient acuity in ICUs in Botswana, with a growing demand for MV amidst a shortage of specialized intensive care nurses (Milan et al 2020). As a result, non-intensive care-trained nurses are increasingly being involved in the care of patients on mechanical ventilators in the ICUs**.** All the nurses in ICU at Mahalapye District Hospital are non-intensive care trained nurses and their roles therefore include caring for patients on mechanical ventilators which require specialized training (Mahalapye District Hospital, 2024). Non-intensive care trained nurses rely on basic nursing education, which does not sufficiently equip them for practice in critical care settings (Barnes *et al*., 2017; Gundo *et al*., 2019), which requires specialised knowledge and skills. As a result, hospital management makes efforts to close the competence gaps of non-intensive care-trained nurses in caring for ventilated patients. These nurses are orientated towards nursing care measures for ventilated patients when allocated to work in ICU to enhance their competency and promote patient safety. This is to prepare these non-intensive care nurses to contribute effectively to the comprehensive care of patients undergoing mechanical ventilation. However, their experiences and perceptions about caring for such patients may be varied considering that they lack adequate specialised training on the use of mechanical ventilators. In addition, non-intensive care trained nurses' experiences and perceptions at Mahalapye District Hospital are not known as the researcher could not find any study that explored the experiences and perceptions of non-intensive care trained nurses in caring for patients on mechanical ventilators, hence the need for this study. Experiences and perceptions of non-trained nurses may significantly affect patient care in terms of patient outcomes, increasing levels of stress and burnout, and skill gaps. Table 1 below shows the percentages of patient outcomes in terms of mortality and nurses 'sick leave, which may be as a result of stress and burnout.

Table 1: Number of patients admitted and on MV and Nurses' Sick Leave at Mahalapye District Hospitals, Mahalapye, Botswana for the period 2021-2023

Year	Total no of admission	Total no of patient on MV	Total no of deaths	Total no of deaths of patient on MV	Percentage of deaths of admitted patients	Percentage of deaths of patients on MV	No of Nurses	Total no of nurses on sick leaves	Percentage of nurses on sick leave
2021	106	8	25	5	23%	63%	8	24	25%
2022	113	9	27	6	23%	67%	8	26	27%
2023	99	11	20	4	21%	36%	8	Not recorded	Not recorded

Source: MDH, 2023

The number of deaths in MDH ICU was observed to be at (23%) of the admitted patients in 2021, with (63%) deaths of the total number of ventilated patients, while (23%) deaths of admitted patients and (67%) deaths of total number of mechanically ventilated patients were recorded in

2022. In 2023, (21%) total deaths were reported and (36%) deaths of ventilated patients. These statistics indicate an average of (22%) deaths of admitted patients and an average of (55%) deaths of patients on MV in a year in MDH ICU. Moreover, the table shows that in 2021, 24 nurses' sick leaves were recorded, accounting for (25%) of nurses on sick leaves, and in 2022, 26 sick leaves were reported, representing (27%) of nurses on sick leave.

Given this context of MDH ICU, the high incidences of patients deaths and increasing number of sick leaves among nurses between 2021 and 2023, we do not know what these non- intensive care trained nurses are going through, their experiences and perceptions in caring for critically ill ventilated patients. Lützerath et al (2022) and Ose et al (2022) assert that work-related sick leaves in ICU are caused by high physical workload, fast paced work, and staff shortage. In addition, stressors related to care of critically ill patients on mechanical ventilators contribute to burnout among ICU nurses, which may result in lower job satisfaction, increased sick leaves or absenteeism, decreased quality of care, and increased patient mortality in ICU (Cishahayo et al., 2019; Kimura et al., 2023; Mahmoudi et al., 2020; Matlakala, 2023).These could indicate that experiences and perceptions of non-intensive care trained nurses caring for MV patients might have a negative impact on patient outcome such as patients complications and increased patient mortality. Despite this prevalent practice, there seems to be little research conducted in two Mahalapye District Hospital in Botswana, specifically exploring how these nurses view and handle the responsibilities of caring for patients on mechanical ventilators. This has created a gap in understanding of their experiences and perceptions in caring for patients on MV. Hence, the primary objective of this study is to explore the experiences and perceptions of non-intensive care-trained nurses in caring for patients on MV.

1.4 Study Justification

Developing an understanding of the subjective perceptions and experiences of non-intensive care trained nurses caring for ventilated patients is important, as this can help improve the quality of nursing care (Mantovan et al., 2020). This can help identify gaps in knowledge and skills which could guide in targeted training and support for these nurses to enhance their competencies and skills in ventilated patient care provision and improved patient outcomes. Exploring the experiences and perceptions of non-intensive trained nurses in caring for ventilated patients could result in identifying the positive experiences and the challenges they face in their roles in caring for ventilated patients. In addition the study could identify gaps in support that non-intensive care trained require and the training needs that would need to be addressed to enhance their knowledge and skills in caring for ventilated patients.

The insights and experiences that will be given by the non-intensive care trained nurses in this study could be valuable in the development of healthcare policies and standards of care for ventilated patients. The findings could help inform national healthcare policymakers and administrators to recognise the positive experiences and challenges encountered by non-intensive care trained nurses, the contributing factors, and the support they require in caring for ventilated patients. This could serve as the foundation for developing appropriate strategies such as standardized protocols and guidelines that improve safety and quality of nursing care provided by non-intensive care-trained nurses and consequently, enhance patients' outcomes. The findings of the study could also help identify the specific capacity-building needs of non-intensive care-trained nurses. This may help guide the development of training programmes and interventions that will improve the knowledge, skills, and competency of non-intensive care trained nurses in caring for patients on MV. Moreover, the study findings could help in contributing to good health and well-being, and quality education. By identifying gaps in knowledge and skills, the study could contribute to improving the quality of care towards the ventilated patients thereby enhancing patient outcomes. In addition, the study could highlight the need for targeted training programmes for non-intensive care-trained nurses, ensuring ongoing professional development and competency in ventilated patient care.

Some studies have been conducted to examine the experiences and perceptions of intensive care nurses in caring for patients on mechanical ventilators. Bäcklund et al. (2018) reported that intensive care nurses experienced job satisfaction when caring for mechanically ventilated patients under light sedation due to improved patient communication but also faced frustration and workload challenges when unable to relieve patient suffering. The inclusion criteria for the study participants were registered nurses with specialist training in intensive care. This created a gap on understanding the perspectives and experiences of non-intensive care trained nurses in caring for mechanically ventilated patients who are under light sedation. Similarly, IJssennagger et al. (2018) reported that intensive care nurses experienced greater communication difficulties with ventilated patients than physicians, but the study did not distinguish between specialized and non-specialized nurses, leaving a gap in understanding the experiences of non-intensive care-trained nurses. These studies help inform the development of interventions addressing nursing care of ventilated patients among intensive care nurses. However, the researcher could not find any that focused on non-intensive care trained nurses, yet they play a significant role in the care of ventilated patients. This poses a gap in understanding the specific experiences and perceptions of non-intensive care-trained nurses in the view of their roles in providing care for ventilated patients, which need to be addressed to enhance ventilated patients nursing care and outcomes.

1.5 Purpose of the study

The purpose of this study was to explore the experiences and perceptions of non-intensive care-trained nurses in providing care for patients on MV. The findings could inform the development of targeted interventions, such as specialised training programs, which could include structured short courses and workshops focused on mechanical ventilation management and emergency response. These interventions would be tailored specifically for non-intensive care-trained nurses to enhance their competence, confidence, and ability to provide safe and effective care, contribute to improving patient outcomes and safety in ICUs.

1.6 Research question

What are the experiences and perceptions of non-intensive care trained nurses in caring for patients on mechanical ventilators in Mahalapye District Hospital in Botswana?

1.6 Definition of terms

Table 2: Definition of terms

Term	Conceptual definitions	Operational definitions
Experience	This refers to the events that have happened to an individual that influence their thoughts and behaviors (Paulsen, 2020).	Experience refers to subjective encounters such as anxiety, thoughts and feelings, and practical situations that non-intensive care trained nurses' at Mahalapye District Hospital in Botswana encounter while caring for patients on mechanical ventilators.
Perception	Perception refers to the action of the mind by which an external object is identified as the source of its sensation (De Lange et al., 2018).	In this study perception refers to non-intensive care trained nurses' subjective viewpoints, opinions, beliefs, and interpretations in caring for patients on mechanical ventilators at Mahalapye District Hospital in Botswana.
Caring	Caring refers to "activities performed by nurses in a compassionate, supportive, and therapeutic environment to promote comfort and healing. Nursing care also should focus on preventing unnecessary suffering." (American Association of the Critical Nurses' Synergy Model for Patient Care, 2017).	In this study, caring refers to providing patients on mechanical ventilators with supportive actions, compassion, understanding, and advocacy in order to address their physical, emotional, psychological, social and spiritual needs.
Mechanical ventilator	A mechanical ventilator is a machine used to support patients with breathing when unable to breathe sufficiently on their own due to a critical illness or to replace their natural breathing mechanism (Shelledy et al., 2019).	A mechanical ventilator in the study refers to a machine used to support patients with breathing when unable to breathe sufficiently on their own due to a critical illness or to replace their natural breathing mechanism.
Mechanical ventilation	Mechanical ventilation is the process of using a ventilator machine to artificially support respiratory function. (Elliot et al., 2018).	In the study, mechanical ventilation refers to the process of using a ventilator machine to artificially support respiratory function.
Non-intensive care trained nurses	Non-intensive care-trained nurse refers to a nurse providing care to critically ill patients in the intensive care unit who has not received specialized training in intensive care nursing (Al Harthy et al., 2023).	Non-intensive care-trained nurse in this study refers to a nurse registered with the Botswana Nursing and Midwifery Council who has not received postgraduate diploma or bachelor degree training in intensive care nursing caring for patients on mechanical ventilation at Mahalapye District Hospital

1.7 Conclusion

The care of critically ill patients on MV in ICUs requires a multidisciplinary approach, with nurses playing a crucial role in ensuring optimal patient outcomes (Hassen et al., 2023; Jackson and Cairns, 2021). The increasing demand for mechanical ventilation and the shortage of specialized ICU nurses have led to non-intensive care-trained nurses taking on the important responsibilities of caring for patients on MV. The study aims to explore the experiences and perceptions of non-intensive care-trained nurses in two district hospitals in the central district of Botswana when caring for patients on mechanical ventilators. By exploring the subjective views of non-intensive care trained nurses, valuable insights could be gained to improve the quality of nursing care provided to ventilated patients (Saritas et al., 2019) and enhance the role of non-intensive care trained nurses in critical care settings. The findings of the study could inform healthcare policies and standards of care for ventilated patients. Additionally, the study could identify specific capacity-building needs and inform the development of training programs to enhance the knowledge, skills, and competency of non-intensive care trained nurses in caring for patients on MV.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The literature on the nursing care of patients on mechanical ventilators, and the experiences and perceptions of ICU nurses in providing care for patients on mechanical ventilation are presented in this chapter. Both recent quantitative and qualitative studies have been explored to provide the current and consistent literature on the subject. Search databases used are Medline, Pub Med, and Willey online library, Google Scholar, Research4life from 2017 to 2024, with search words; mechanical ventilation, nurses' experiences, nurses lived experiences, nurses' perceptions, and caring in ICUs. However, it seems that there has been little research conducted in exploring the experiences and perceptions of non-intensive care trained-nurses in caring for patients on mechanical ventilators. Therefore, related literature on experiences and perceptions of intensive care nurses in caring for patients on mechanical ventilators, as both the intensive care nurses and non-intensive care nurses are part of the team caring for patients on mechanical ventilators.

This chapter consists of literature covering nursing care for patients on MV, and ICU nurses' experiences and perceptions in caring for patients on MV, to help the researcher familiarise with the existing information and knowledge in the subject under study.

2.2 Nursing care for patients on mechanical ventilators

Nurses in ICU perform various critical roles on patients on MV, such as monitoring of ventilator settings, observing how patient respond to MV, and carrying out nursing intervention to correct patients' responses. These roles are important in ensuring improved patient outcomes in intensive care settings. In caring for patients on a ventilator, non-intensive care trained nurses monitor and adjust basic ventilator support features such as the ventilator mode, settings, and alarms. Regular adjustments of tidal volume, respiratory rate, Positive End Expiratory Pressure (PEEP), and Fraction of inspired oxygen (FiO2) are based on ongoing assessments of the patient's respiratory status. Nurses respond promptly to ventilator alarms, which may indicate ventilator or patient problem such as airway obstruction or disconnection, Marta et al (2019), it is critical to identify problems including respiratory distress, dyspnea, and increased breathing effort as well as the interventions to address those (Hassan et al., 2023). Therefore non-intensive care nurses make autonomous decisions in interventions, especially in the Botswana setup where the doctor is not available 24 hours a day. They intervene while awaiting the doctor to arrive, to help prevent the risk of severe complications, and enhance the patient's ventilation and oxygenation, leading to better patient outcomes (Schwartzstein et al, 2023;Telias et al., 2022). According to Paul et al. (2020), to deliver the best patient-centered care and prevent complications, it is important to have the ability to quickly recognise and handle common patient and ventilator-related problems.

Nurses also play an important role in preventing ventilator complications such as pneumonia and lung injury in ventilated patients. This is achieved through ICU nurses employing infection control strategies, such as maintaining good oral hygiene to prevent infections of the oral cavity, maintaining patients positioned to prevent pressure ulcers or pneumonia, and promoting early mobilisation (Boltey et al., 2017). When patients are intubated, their natural defenses against infections are compromised (Cooper, 2021). The endotracheal tube interferes with normal mucus secretion and clearance and bypasses the normal filtration, warming, and humidification processes of the airway. As a result, microorganisms may get into the respiratory system and cause infections like ventilator-associated pneumonia (VAP). Therefore, non-intensive care trained nurses regularly provide oral care to ventilated patients, and this is achieved through the use of mouth swabs, mouth rinses, tooth brushing, and chlorhexidine (Gershonovitch et al., 2020). Moreover, non-intensive care nurse-trained nurses assist in the early mobilisation and repositioning of ventilated patients to prevent complications. They regularly change the patient's position while performing passive range of motion exercises. Alaparthi et al. (2020); Zhang et al. (2018) assert that early mobilisation of ventilated patients may have positive outcomes like decreased delirium, muscle atrophy, and duration of mechanical ventilation, shortened ICU stay, improved physical function, and improved quality of life. Therefore, non-intensive care trained nurses are crucial in caring for patients undergoing MV and in preventing ventilator-related complications.

Patients on MV frequently feel discomfort, agitation, anxiety, and delirium (Gitti et al., 2022; Urner et al., 2018). Therefore, nurses ensure proper sedation and pain management for patients on MV which are crucial for optimising patient comfort, reducing the risk of ventilator-induced lung injury, and minimising agitation-related complications (Pearson and Patel, (2020). Temesgen et al (2021) and Tripathy (2021), poorly managed pain and agitation are associated with worsening of the critical condition, an increase in sympathetic tone, and a higher incidence of accidental medical device removals by accident, including vascular catheters and endotracheal tubes. Furthermore, inadequate pain treatment might interfere with the synchronisation of the patient and ventilator (Yamashita et al., 2017). As such, non-intensive care trained nurses regularly assess ventilated patients for pain, anxiety, agitation, restlessness, and delirium and carry out interventions that could be pharmacological or non-pharmacological to control pain. According to Urner et al. (2018) and Kent et al. (2017), treating pain in critically ill patients involves prevention, assessment, and treatment. Non-intensive care trained nurses routinely assess the pain of ventilated patients based on self-reports and using behavioral pain assessment tools and intervene accordingly to provide patient comfort. Non-intensive care trained nurses anticipate and prevent pain with analgesia during nursing care procedures such as position change, mobilisation, inserting catheters, and wound care. The aim is to have a calm, comfortable, and collaborative patient to enhance active cognition stimulation, communication with the healthcare team, active mobilisation, and early release from the endotracheal tube and MV, all of which are critical for patient-centered outcomes (Gitti et al., 2022).

2.3 Socio-demographic characteristics of non-intensive care trained nurses

Understanding the socio-demographic characteristics of non-intensive care-trained nurses who care for patients on mechanical ventilators is important, as these factors could influence their experiences and perceptions (Rababa et al., 2023). Key factors include age, gender, level of education, and years of nursing experience and caring for ventilated patients. The level of education of non-intensive care-trained nurses could impact their knowledge and clinical practices. Alhamad and Elsayed (2024) and Getahun et al. (2022) asserted that nurses with advanced education demonstrated better adherence to ventilator-associated pneumonia preventive practices in ICU settings. Studies by Elhabashy et al. (2024) and Hashish et al. (2020) reported that a higher educational level is directly associated with a higher level of nurses' competency. The studies reported that nurses with baccalaureate degrees are more capable of providing competent care, have greater skills and knowledge, are more confident, and take the initiative to keep up to date on new information. According to Innab et al. (2022), nurses with bachelor's degrees knew more about pain management and had more positive attitudes about it than nurses with diplomas. Furthermore, nurses with a master's degree and those who took postgraduate pain management courses demonstrated noticeably superior knowledge than their counterparts with only an associate degree, according to Sweity et al. (2022). These could indicate that advanced academic preparation among non-intensive care-trained nurses could be important in enhancing their competence, which is a crucial aspect of care for mechanically ventilated patients.

Clinical experience is closely linked to competency in patient care, with experienced nurses exhibiting higher levels of clinical proficiency and confidence in handling complex situations (Shibiru et al., 2023). Cheng (2024) reported that years of nursing experience had a significant relationship with nurses' readiness and willingness to care for COVID-19 patients on mechanical ventilators. This suggests that experienced nurses may feel more prepared and confident in their ability to manage ventilated patients. In addition, a study by Alhamad and Elsayed (2024) reported that there is a significant relationship between age, nursing experience, ICU experience, and training on VAP prevention. The study reported higher knowledge levels and adherence to VAP preventative measures among nurses over the age of thirty, those with six or more years of nursing experience, and those with more than a year of intensive care unit experience. This may indicate the importance of continuous clinical exposure in enhancing non-intensive care-trained nurses' knowledge and practical skills in caring for ventilated patients. Furthermore, Lee and Kang (2020) reported that nurses' professional knowledge, skill proficiency, self-efficacy, and coping abilities were positively impacted by higher education levels, more nursing experience, and specialised training programmes which contributed to greater confidence and a more proactive attitude towards patient care.

2.4 ICU nurses’ experiences in caring for patients on mechanical ventilators

Mechanical ventilation is important for critically ill patients, but it is uncomfortable and irritating, which adds to the difficulties and challenges of care provision (Elliot 2018).This can affect the experiences of nurses differently as some may feel good to provide lifesaving care to patients while some may feel overwhelmed by care demands and seeing patients suffering in spite of their efforts in care provision. Alrabae et al. (2021), ICU nurses reported that caring for patients in the ICU is physically and emotionally demanding. Dikmen et al. (2022) reports that ICU nurses perceived caring for critically ill patients stressful as they experienced empathy, sadness and fear associated with their roles in caring for critically ill patient in ICU. The ICU nurses reported experiencing happiness when patients were successfully discharged. Fear, stress, sadness and unhappiness were expressed due to the critical conditions of patients and challenges in providing sufficient care due to high number of patient. Additionally, family members were reported as important but their reactions and demands reported as cause of stress among ICU nurses. However, Cheng et al. (2021) reported that even during COVID-19 pandemic the majority of ICU nurses had a good behavioral intention to care for patients on MV.

Mukuve and Nuuyoma, (2023) report that when providing care for patients on mechanical ventilation, nurses in ICU had a range of emotional responses. They found the work rewarding and felt knowledgeable and confident in their duties in providing care for patients on mechanical ventilation. The ICU nurses in the study did, however, have emotional difficulties due to their concerns about the patients' well-being and progress, the pain and distress the patients undergo while on mechanical ventilation, and the risk of contracting infections. Nurses perceive caring for patients on mechanical ventilation to be physically and emotionally exhausting (Nadia et al., 2023; Tolotti et al., 2023). Patients on MV are often critically ill, and their condition can change rapidly and therefore require continuous monitoring and intervention by ICU nurses. ICU nurses may experience emotional strain and fatigue as a result of the intense, constant monitoring and intervention needed for ventilated patient. In addition, the fluctuations in patient conditions and the continuous need to make critical decisions could cause increased stress and anxiety among ICU nurses. Furthermore, ICU nurses may empathise with ventilated patients' suffering and feel a strong sense of responsibility for the patients' well-being. The emotional burden of caring for ventilated patients over time could lead to burnout and compassion fatigue, Alharbi et al. (2019) and Al-Majid et al. (2018) among the ICU nurses.

Urner et al. (2018) state that a complex interaction of physiological, pathological, and environmental factors frequently promotes and influences a mix of pain, restlessness, anxiety, and delirium in critically ill patients who require mechanical ventilation. To manage their agitation, anxiety, and ventilator dyssynchrony, these patients are given sedative medications (Guttormson et al., 2019). Less sedative medication is now used due to a recent paradigm change in therapy, which has been shown to improve survival, the length of ICU stay, and the number of days spent on mechanical ventilation (Devlin et al., 2018). Hetland et al. (2018), reports that a variety of factors affect how ICU nurses give sedatives to patients on mechanical ventilation, including the patient's specific needs, the nurse's synthesis of clinical evidence, applications of best practices, and different perspectives on professional and personal practice.

Bäcklund et al. (2018) reported that nurses who were providing care for patients on mechanical ventilators under light sedation experienced job satisfaction. The nurses' job satisfaction was enhanced by the patients' responses, and the care they received was made easier by their capacity to interact verbally. ICU nurses reported that they valued interacting with patients who were conscious on MV, stressing the value of effective communication in the care of patients on MV (Mortensen et al., 2019). The ability of patients to interact verbally due to light sedation allows ICU nurses to better understand patients' needs and provide individualized care. As a result, ICU nurses could experience fulfilment in providing care. ICU nurses may find it gratifying to collaborate with patients in decision-making and care planning, which could contribute to job satisfaction. Studies conducted in Iran by Babazadeh et al. (2019) and Wang et al. (2020) in China reported that ICU nurses exhibited positive attitudes in the early mobilisation of patients on MV. Improved ventilated patient outcomes as a result of early mobilisation practices could make ICU nurses experience job satisfaction and inspire their attitudes towards how they perceive early mobilisation of patients on MV. ICU nurses could be motivated to maintain early mobilisation if they believe they are having a significant impact on the ventilated patients' health outcomes.

Communication between patients and ICU nurses is important in patient care provision. Studies report that critically ill patients, especially those on mechanical ventilation, have difficulty communicating. According to a study in the Netherlands by IJssennagger et al. (2018) on caregivers' perceptions towards communication with mechanically ventilated patients, ICU nurses experienced more communication difficulties than physicians. Due to communication difficulties, (43%) of the caregivers reported losing a valuable amount of time, particularly ICU nurses (52%). A majority of respondents agreed that communication problems interfere with providing adequate patient care, affecting various aspects, including psychoemotional care, general care, symptom assessment, plan-of-care, and end-of-life care. Additionally, participants reported that communication problems had an impact on their level of job satisfaction, with nurses reporting higher levels of impact than residents and intensivists. As a consequence, feelings of not being fulfilled and frustration were reported. Participants indicated they were dissatisfied with their communication skills with mechanically ventilated patients. When nurses are unable to fulfill their perceived professional responsibilities due to communication barriers, they may experience internal conflict such as guilt over not being able to provide holistic, patient-centered care, when the nurse cannot interpret or address the patient’s care needs, this could lead to reduced job satisfaction among the ICU nurses. A high number of nurses reported they needed communication training. Similar findings of ICU nurses experiencing frustration as a result of communication difficulty with mechanically ventilated patients were reported in a qualitative study in Pakistan by Nadia et al. (2023). The ICU nurses reported that they required training on verbal and non-verbal communication with mechanically ventilated patients. Johan et al. (2017), in a descriptive study conducted in India, highlighted lack of training as a stress factor among ICU nurses. The ICU nurses in the study expressed the need for further education in critical care, as it enhances nurses’ skills and knowledge and enables them to utilize technologies used in care provision. These reviewed study focused on ICU nurses, physicians, and intensivists without specifically examining the experiences and needs of non-intensive care trained nurses in caring for patients on mechanical ventilators. While the studies provide valuable insights into the challenges faced by healthcare professionals in caring for ventilated patients, they do not specifically address the unique perspective of non-intensive care-trained nurses, who have not received specialized training in intensive care but are part of the team in caring for ventilated patients.

Mortensen et al. (2019) in Denmark investigated the viewpoints of expect and competent ICU nurses caring for non-sedated, mechanically ventilated ICU patients. The study reported shared frustrations and inadequacies in nurse-patient communication. Insecurity affected both expert and competent ICU nurses, resulting in feelings of personal failure. Some ICU nurses reported avoiding difficult circumstances. Both expert and competent ICU nurses expressed the need for additional staffing for the patients, reporting increased frustration and insecurity due to the shortage of ICU nurses. Despite the frustrations, expect ICU nurses reported that they valued interacting with patients who were conscious, emphasising the importance of effective communication. A lack of communication tools and training was reported by both ICU expert and competent nurses, and the need for training to improve verbal and nonverbal communication was reported. Another study by Holm et al. (2017) reported that both the ICU nurses and non-sedated mechanically ventilated patients experienced negative emotions and frustration when attempting to communicate with each other. According to the study, when patients' needs and desires were not addressed, intensive care unit nurses became frustrated because they could not comprehend what the patients were trying to say. The patients felt undignified and ashamed as a result of being voiceless. Moreover, Akroute et al. (2022) reported that ICU nurses reported experiencing difficulties and stress trying to understand voiceless tracheostomy patients on MV, who are unable to vocally communicate their symptoms, levels of discomfort, and needs.

Considering the experiences that ICU nurses had in these studies, it is clear that good communication is essential to delivering patient-centered care. Patients may believe that ICU nurses are not sympathetic or understanding when there is a communication gap, which can make the patient feel hopeless. Patients may give up and stop communicating altogether as a result of poor communication (Karlsen et al., 2018). Similarly, nurses may feel that they are failing to fulfil their role in meeting patients' needs, which could contribute to frustration and emotional distress. Therefore, it is important to explore how non-intensive care trained nurse in Botswana experience and perceive caring for ventilated patients, which could be of similar context of patient being slightly sedated. Moreover, these studies are conducted in developed countries and nurses report the need for more training, therefore how about non-intensive care-trained nurses experiences in their role in Botswana where there is limited training for nurses. Therefore the need to explore their experiences in providing care for mechanically ventilated patients.

Yang et al. (2017) reported that mechanically ventilated patients experience high prevalence of delirium. The high incidence is associated with adverse outcomes, such as prolonged mechanical ventilation and extended hospital stays. LeBlanc et al. (2018) examined the lived experience of intensive care nurses caring for patients with delirium. The study reported that ICU nurses perceived caring for agitated and delirious patients on mechanical ventilation to be complex. As they worked to ensure patient safety and deliver patient-centered care for patients and their families, ICU nurses experienced it to be mentally and emotionally exhausting. Nursing care for ventilated patients with delirium requires ICU nurses to make critical decisions, keep a close eye on the patient's condition and the ventilator, and ensure the patient's comfort. In addition, patients' agitation raises ICU nurses concerns regarding patient safety. Therefore, ICU nurses work to provide the necessary interventions and, at the same time, prevent the risk of harm and complications to the patient. As such, caring for ventilated patient requires ongoing monitoring and awareness for the possibility of unforeseen change of patient condition. This could lead to ICU nurses to experience mental and emotional strain.

2.5 ICU nurses' perceptions in caring for patients on mechanical ventilators

Critically ill patients on MV experience life-threatening conditions that require continuous monitoring and interventions. Such interventions can cause patients discomfort, restlessness and agitations and delirium.(Wang et al., 2023) and Thomas et al (2021) report that there are high incidences of delirium in patients on MV due to physical environment, the severity of disease, and treatments. Therefore ICU nurse play an important role in carrying out interventions to ensure patients' safety during care provision. Tsang et al. (2019) state that the management of agitation and delirium may necessitate the use of physical restraint (PR) in the ICU. Physical restraint, as defined by Bauer et al. (2017), involves the application of any physical method or device on a patient's body, not easily removable, to restrict body movements. Perez et al. (2021) asserts that ICU nurses reported feeling of increased pressure and responsibility on use of PR during MV. ICU nurses reported that it is difficult to care for these patients and ensure their safety because of their confusion, agitation, delirium, sedation, and underlying illnesses. The ICU nurses reported that airway protection influenced their decisions to apply PR, with a focus on preventing self-extubation. However, the ICU nurses also reported that while harm is not intended by the application of PR, it often leads to negative consequences physically, emotionally, and psychologically for patients and their families. ICU nurses reported that although PR was frequently used to address restlessness and agitation that was interfering with treatment, it actually made patients more agitated. Despite this, ICU nurses still regarded PR as a necessary intervention in the care of patients. The necessity of restraints was reported as an essential component of maintaining patient safety. The study also reported that despite the consensus among participants that PR practice is warranted in intensive care, there was also recognition that they are often overused, particularly for airway protection. In addition, nurses reported having not received any formal training or education regarding PR. Furthermore, nurses reported that they had minimal knowledge or awareness of the PR policies within their own units and that they needed training.

Similar study by Salehi et al. (2020) in Iran state that ICU nurses reported experiencing negative emotions, including sadness, guilt, pity, sorrow, pain, and suffering, while using PR. These emotions were reported to have affected their self-confidence and morale and led to feelings of despair and disability. The ICU nurses reported experiencing moral distress in difficult moral situations when they needed to decide on either maintaining patient safety or patient autonomy and freedom. They expressed dissatisfaction with the lack of education on PR, standard guidelines, and equipment for PR and its appropriate use provided by hospital managers and authorities. However, Cui et al. (2021) reported that ICU nurses prioritized patient safety over patient comfort. They perceived PR as essential to prevent unplanned extubation, which is a serious adverse event to patient safety. Critical care nurses expressed confidence that PR could prevent patients from unplanned extubation and the influence of PR on patient comfort. Although PR was a routine measure, critical care nurses reported facing dilemmas in the implementation of PR. The study reported that critical care nurses reported that it was impossible to achieve a balance between patient comfort and safety. They reported feeling stressed if the patient was not restrained because of patient safety and would feel powerless and guilty due to the perception that PR negatively affects patients' comfort. ICU nurses use PR because they have a responsibility to continue life-saving interventions, even when they are aware that it can cause patients to experience pain, trauma, or a sense of dehumanisation.

Alrabae et al. (2021) reported that ICU nurses experienced high workloads, and physical and mental demands in caring for ventilated patients in intensive care units. The study findings also reported that half of the participants held positive perceptions of patient safety, stating that patient safety was not compromised in the ICU and the clinical environment was perceived as safe. However, the study reported that over a quarter of the ICU nurses expressed negative perceptions of patient safety. Another similar study conducted by Salem et al. (2019) reported that nearly half of the interviewed ICU nurses had positive perceptions of patient safety in the ICU. Turan et al. (2020), high workloads have been linked to psychological changes among ICU nurses like sadness, hopelessness, intolerance, introversion, stress, distraction, and self-insufficiency. In addition high workloads eventually compromise patient safety and the provision of quality care to patients who are critically ill, as well as having a negative effect on the wellbeing of nurses (Aprilia et al., 2019; Banda et al., 2022). The studies indicate that high workloads in ICU can negatively affect the health both patients and ICU nurses, which could result in compromised patient safety and care provision despite some nurses being reported to perceive good patient safety.

This literature reveals that ICU nurses have different perspectives in caring for patient on MV which result from their emotional experiences, and the need to fulfil their roles in patient care. In caring for patients on MV, ICU nurses face high workloads which lead to emotional distress. In addition ICU nurses view use of PR important to prevent unplanned extubation thereby prioritizing patient safety over comfort. Therefore, there is the need to explore how non-intensive care trained nurses perceive and experience caring for patients on MV, as these studies did not specifically focus on these nurses who are not specialized in intensive care.

2.6 Conclusion

Mechanical ventilation plays a critical role in supporting patients with respiratory failure, but it also presents challenges such as ventilator-associated complications (Pearson and Patel, 2020). In caring for ventilated patients, non-intensive care nurses manage ventilator settings and carry out interventions to optimise patient ventilation. Literature reports that ICU nurses face physical, emotional, and mental demands in caring for ventilated patients, Nasirizad et al.(2021), including high workloads, communication difficulties, and ethical dilemmas regarding the use of physical restraints (Canzan et al., 2021). While the studies provide valuable insights into the experiences and perceptions of ICU nurses in caring for patients on mechanical ventilators, they do not clearly specify the experiences and perceptions of non-intensive care trained nurses who care for ventilated patients to obtain their views on caring for such patients. Moreover, the studies were conducted in other countries, mostly developed countries, and the ICU nurses reported that they need training in some specific areas in the care provision of patients on MV, such as the use of PR, and communicating with patients on MV. The research could not identify related studies conducted in Mahalapye District Hospital in Botswana; as such, the need to conduct a study to explore how non-intensive care trained nurses experience and perceive their care for mechanically ventilated patients.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter gives a detailed account of the research methods and designs used in the study to achieve its objectives. The research methods consist of the research design, study setting, target population, sample and sampling method, data collection process, trustworthiness, plan for data analysis and presentation of findings, and ethical considerations,

3.2 Study design

In this study, a qualitative descriptive phenomenological research design was used to explore the experiences and perceptions of non-intensive care nurses caring for mechanically ventilated patients. Neubauer et al (2019), asserts that in order to obtain a greater understanding of how individuals perceive and interpret their lived experiences, it entails exploring those experiences. Therefore, the qualitative descriptive phenomenological design was appropriate for this study because it gave a complete account of non-intensive care trained nurses' detailed experiences and perceptions in caring for ventilated patients in MDH.

3.3 Study setting

The study was conducted at Mahalapye District Hospital (MDH) general ICU in Botswana. MDH has a bed capacity of about 250 beds, and admits an average of 150 to 210 patients per month. The services provided in the hospitals include general medicine, obstetrics and gynecology, surgical care, pediatric care, emergency care, and outpatient care; radiological services, which include X-rays and ultrasound scans; and laboratory services. The general ICU has a total of six beds and admit adults and children with medical, surgical, obstetric, and gynecological conditions. The ICU is managed by intensivist, and physician or general medical doctor manages in the absence of the intensivist. Patients requiring high-acuity care are referred to referral hospitals, as the ICU do not have sophisticated medical equipment and medical specialists such as neurologists. MDH record book indicates an admission average of eight to fifteen patients per month. MDH ICU has eight registered nurses, and all of them are non-intensive care trained. The ICU setting in MDH is where critically ill and mechanically ventilated patients are admitted and cared for, and where non-intensive care trained nurses take part in providing nursing care to patients on MV.

3.4 Study population

The study population comprised all the nurses involved in caring for patients on MV regardless of their training in critical care, in Mahalapye District hospital in Botswana.

3.4.1 Target population

The target population for this study were all non-intensive care-trained nurses who were directly involved in the care of patients on MV at Mahalapye District Hospital in Botswana.

3.4.2 Accessible population

The accessible population included non-intensive care trained nurses from the target population who were available during the time of the study and willing to participate.

3.5 Sampling

3.5.1 Sampling technique

Purposive sampling was used in this study to recruit participants who had relevant experience in caring for mechanically ventilated patients. Purposive sampling allowed researchers to identify potential participants who could contribute an understanding of the topic being researched (Keba et al., 2021). The researcher selected non-intensive care-trained nurses who were directly involved in ventilated patient care for more than one year in MDH ICU, as the researcher believed they had sufficient exposure to caring for ventilated patients, ensuring that the data collected was rich and relevant. This approach allowed engaging participants who had firsthand knowledge and could provide in-depth insights, Shaheen and Pradhan (2019) and Kaba et al. (2021), into their experiences and perceptions in caring for ventilated patients.

3.5.2 Sample size

The sample size was determined by data saturation, which was the point at which no new idea is generated by the participants (Brink et al., 2018). Giorgi (1997) and Sandelowski (1995) suggested that a sample size of 6-12 participants is sufficient to capture the essence of the phenomenon under study. In this study, data saturation was reached on the 6^{th} participant, and a total of 8 participants were interviewed.

3. 6 Inclusion and exclusion criteria

3. 6.1 Inclusion criteria

3.6.1.1 Non-intensive care trained nurses caring for patients on mechanical ventilators.

3.6.1.2 Non-intensive care trained nurses who have cared for patients on mechanical ventilators for more than one year.

3.6.1.3 Non-intensive care-trained nurses who agree to participate in the study and sign a consent form.

3.6.2 Exclusion criteria

3.6.2.1 Non-intensive care trained care nurses who have cared for patients on mechanical ventilators but not available for various reasons, such as sickness, during the time of data collection.

3.7 Data collection approaches

3.7.1 Data collection tool

Data was collected using unstructured interviews following an interview schedule that the researcher created based on the literature review and research question. Interviews helped in keeping the interview focused on the intended concept and interviewing participants in a systematic way. The first part of the interview schedule comprised of participants' socio-demographic characteristics, while the second part comprised of two open-ended core questions focusing on the concepts in the research question. The two core questions are; question one: what have been your experiences of providing care for patients on mechanical ventilators? Question two: can you tell me about how you perceive caring for patients on mechanical ventilator? These questions were followed by probing open-ended questions guided by response from participants for the researcher to get clarification and in-depth understanding. Open-ended questions facilitated in-depth discussion with the participants as they expressed their experiences and views of caring for ventilated patients, as stated by Moser and Korstjens (2018). Some of the probing questions were as follows:

Question one: What have been your experiences of providing care for patients on mechanical ventilators?

Probes:

1. Have you received any formal training on mechanical ventilation? If not, how did you acquire the skills needed to care for ventilated patients?
2. Could you describe a situation where you felt challenged and uncertain during the care provision of a ventilated patient?
3. How did you handle this challenge?

Question two: Can you tell me about how you perceive caring for patients on mechanical ventilators?

Probes:

4. How has caring for ventilated patients affected your confidence and professional development?
5. How has your perception of care for the ventilated patient been shaped by the support of your colleagues?
6. What do you think could be done to improve the nursing care of patients on mechanical ventilation by the non-intensive care trained nurses in the ICU here?

3.7.2 Data collection technique

The researcher conducted in-depth, face-to-face interviews with non-intensive care trained nurses working in MDH ICU. The data collection process began by engaging the head of the ICU, who assisted in identifying eligible participants. The researcher then approached each potential participant individually during their work hours in the ICU, explaining the study's purpose, procedures, and the importance of their participation. Those who agreed to take part were given the participant information sheet which explained the background of the study, the purpose of the study, the procedures, and the importance of their participation, emphasizing what the researcher explained. Interview dates and times were arranged based on participants' availability to ensure minimal disruption to their duties. The interviews were conducted in the doctor's office which was seen as quiet by the researcher suitable for ensuring confidentiality. At the start of each interview, participants were greeted warmly, and their consent for participation and audio recording was obtained, then demographic information, including age, gender, education level, years of nursing experience, and years of experience caring for ventilated patients, were recorded. The researcher followed the interview guide to maintain consistency, asking core questions and using probing questions to encourage elaboration and gain a deeper understanding of participants' experiences. Interviews were audio recorded with participants' permission, and additional notes were taken in a journal. Each session lasted approximately 45 minutes to one hour. At the end of the interview, the researcher summarized key points and allowed participants to provide further comments or clarifications. Participants were then thanked for their time and contributions.

3.8 Trustworthiness

Trustworthiness in qualitative research ensures the credibility and reliability of the data collected. This study adhered to the principles of credibility, dependability, conformability, and transferability as outlined by Lincoln and Guba (1985) and Stahl and King (2020), ensuring that the findings accurately represent the experiences and perceptions of non-intensive care-trained nurses caring for ventilated patients.

3.8.1 Credibility

Credibility refers to the accuracy and truthfulness of the data collected and analyzed (Stahl & King, 2020). To establish credibility, the researcher spent adequate time building rapport with participants before and during the interviews, allowing them to feel comfortable sharing their experiences and perceptions. The researcher remained engaged in the data collection process until data saturation was reached, ensuring that no new themes emerged. To maintain the accuracy of the data, interviews were audio-recorded and transcribed verbatim. After transcription, member checking was conducted by giving participants their transcribed interviews to review and verify that their responses were accurately captured. This process helped ensure that the findings genuinely reflected participants' experiences and minimized any misinterpretation of their narratives (Netshisaulu et al., 2019).

3.8.2 Dependability

Dependability refers to whether the findings can be applied to a similar context, setting, and other participants, and produce similar findings (Megheirkouni & Moir, 2023). Dependability was ensured by the researcher documenting the research process, including study design, data collection techniques, and methods of analysis. This documentation was reviewed by the supervisor and co-supervisor, who provided feedback, with necessary revisions and corrections made before proceeding with data collection. By maintaining a clear well documented systematic research process the researcher ensured that the study could be replicated in a similar setting with comparable results.

3.8.3 Conformability

Conformability refers to the potential for congruency of data in terms of accuracy, relevance, or meaning, and that the data was provided by the participants (Stahl & King, 2020). It ensures that the data and findings accurately represent participants' voices without being influenced by the researcher's biases. To minimize personal influence, the researcher employed bracketing, setting aside preconceived notions, assumptions, and prior experiences related to caring for ventilated patients. Additionally, the interviews were audio-recorded and supplemented with written notes, ensuring that findings were based solely on participants' narratives. During data analysis, emerging themes were cross-checked against original transcripts, to confirm the correctness of findings and interpretations (Polit & Beck, 2021).

3.8.4 Transferability

Transferability was ensured by providing detailed descriptions of the study setting, participant selection process, data collection procedures, and analysis methods, allowing other researchers to determine whether the findings apply to their contexts. Purposeful sampling was employed to obtain rich data from non-intensive care-trained nurses, ensuring that the study findings reflected a range of experiences. The study's findings were also supported by existing literature, enhancing their credibility and relevance for use in other context (Alhamad & Elsayed, 2024; Getahun et al., 2022).

3.9 Data management and storage

Data management began during the data collection phase, where in-depth, face-to-face interviews were conducted and recorded using an audio recorder. This method ensured the accuracy and authenticity of participants' responses. Immediately after each interview, the audio recordings were securely transferred to a password-protected computer to prevent data loss. Field notes taken during the interviews were also organized systematically to complement the transcribed data.

After the completion of each interview the researcher manually transcribed each interview within five to six hours. Manual transcription was used to ensure that participants' contextual details were accurately captured. Each transcript was carefully cross-checked against the original audio recordings for accuracy. Once the transcripts were finalized, NVivo software was used to organize, code, and manage the data systematically. The software aided in categorizing themes, patterns, and relationships within the data, enhancing the rigor and transparency of the analysis process.

To protect participant confidentiality, each transcript was anonymised with different alphanumeric codes. These codes were systematically assigned and recorded in a separate, encrypted document, ensuring that the identities of participants remained confidential. The transcriptions were further reviewed and cleaned to correct any inconsistencies, to ensure data integrity. Data security and confidentiality were prioritized throughout the study. The digital files, including audio recordings, transcribed documents, coded NVivo files, and field notes, were stored on a password-protected, encrypted computer. A backup copy was also maintained on an external hard drive, which was stored in a locked cabinet to prevent data loss. Printed copies of transcripts, signed informed consent forms, and demographic information sheets were securely stored in a locked file cabinet accessible only to the researcher.

3.10 Data analysis

Data analysis involved coding the transcribed interviews, incorporating field notes, and identifying emerging themes relevant to the experiences and perceptions of non-intensive care trained nurses caring for mechanically ventilated patients. Thematic analysis, as outlined by Braun and Clarke

(2006), was employed to systematically analyze the data by identifying patterns and themes that provided insights into participants' experiences. The six-step process of thematic data analysis was followed as described below:

Step 1: Familiarization with the Data

The process of analysis began with manual transcription of the audio-recorded interviews verbatim. The transcribed data was then cross-checked against the original recordings to ensure accuracy and preserve participants' expressions. Field notes taken during interviews were integrated into the transcripts to provide contextual understanding. The researcher read and re-read the transcripts multiple times about ten times, making initial notes and reflections on recurring ideas to gain a deep understanding of the data. This process allowed the researcher to immerse in the data and recognize emerging patterns and connections (Braun & Clarke, 2019). Recurring mentions of "limited understanding and knowledge of operating the ventilator" and "lack of equipment" were some of the patterns identified

Step 2: Generating Initial Codes

After familiarization, initial codes were developed. A list of topics were made from the written notes, and similar topics were clustered together, dividing the data into smaller groups that provide similar or related meaning (Grove et al., 2017). Thereafter, these groups were condensed to produce codes (Östman et al., 2021). Both deductive and inductive coding approaches were used. Deductive codes were based on pre-existing research questions on challenges and coping strategies while inductive codes were derived directly from the participants' words and phrases. Some of the codes derived were "lack of knowledge and skills, and emotional trauma due to patient deterioration and death".

Step 3: Searching for Themes

In order to provide a more understandable data set for the final written report, similar codes were then sorted into categories or themes. For instance, codes such as "shortage of staff and equipment, and demotivating and depressing work environment" were placed under a broader category, "resource and organisational challenges".

Step 4: Reviewing the Themes

The themes were then carefully reviewed to ensure they were coherent, distinct, and well-supported by the coded data. Each theme was checked against the original transcripts to validate its accuracy and relevance. The researcher re-evaluated themes that overlapped or lacked clarity, refining them through comparison with participant narratives to identify the meaning and determine the category. This review process ensured that themes were grounded in the data and that there was a clear distinction between the different themes (Nowell et al., 2017; Naeem et al., 2023).

Step 5: Defining and Naming the Themes

Each theme was clearly defined and labeled based on the central idea it represented and five major themes were identified. Sub-themes were also identified to further organise and explain specific aspects of the themes. The researcher ensured that the theme names accurately reflected the data and provided meaningful insights into participants' experiences and perceptions.

Step 6: Writing the Report

The final stage involved interpreting the findings and organizing them into a comprehensive research report. Each theme was described in detail, supported by direct quotes from non-intensive care trained nurses to illustrate the richness and depth of their experiences and perceptions. The themes were then analysed in relation to existing literature, highlighting similarities, differences, and new perspectives. This ensured that the findings contributed to the broader understanding of the topic while maintaining the authenticity of participants' voices.

3.11 Pilot study

A pilot study was conducted before the main study was conducted. The main purpose was to assess the feasibility and effectiveness of the research design, tool, and procedures. It was cardinal to assess how the flow of probing for questions would be encountered. This was particularly important because the researcher is a novice in qualitative designs. The pilot study was conducted at Sekgoma Memorial Hospital (SMH), a 300-bed facility with a six-bed general ICU managed by intensivists. SMH was chosen because it provides similar general critical care services as the main study hospital, including medical, surgical, and pediatric critical care. Additionally, both hospitals face nursing staff shortages, with SMH having only ten nurses in its ICU. Like the main study site, nursing care for critically ill and ventilated patients at SMH is provided by non-intensive care trained nurses, making it an appropriate setting for the pilot study.

The pilot study involved interviews with two non-intensive care trained nurses who had over one year of experience caring for ventilated patients. These participants were selected because they shared similar characteristics with the target study population and could help identify gaps in the interview guide before the main study. The pilot study revealed the need for minor adjustments to improve the comprehensiveness and flow of follow-up questions. The researcher encountered challenges in separating follow-up questions on experiences from those on perceptions. Some follow-up questions initially designed to explore experiences naturally led to discussions about perceptions, making it difficult to maintain a clear distinction between the two. To address this, the interview guide was modified to incorporate probes on perceptions within experience-based questions, where appropriate. This adjustment allowed the researcher to explore deeper descriptions of the context discussed by participants. For example, when a participant described experiencing staff shortages, it naturally led to follow-up questions about their perceptions of care provision in emergency situations, particularly when working alone on a shift, and how they felt in those moments. Embedding these follow-up probes ensured a more seamless and meaningful exploration of participants' experiences and perceptions. Additionally, the pilot study provided the researcher with valuable practice in conducting qualitative interviews, improving confidence, questioning techniques, and the ability to navigate discussions effectively. These refinements ensured that the main study interviews would be more structured, engaging, and capable of capturing rich, in-depth data.

3.12 Ethical consideration

Researchers adhere to various research standards to protect study participants and the integrity of the research process (Rana et al., 2021). Some of the ethical principles that were adhered to in conducting this study include seeking permission to conduct research, informed consent, confidentiality, and anonymity.

3.12.1 Permission to conduct research

Ethical approval to conduct the research were obtained from the University of Zambia Biomedical Research Ethics Committee (UNZABREC) (Reference number 5588-2024), Botswana Ministry of Health Human Research and Development Committee (HRDC) (Reference no HPRD: 6/14/1) and Mahalapye District Health Management Team (MDHMT) Institutional Review Board (IBR) (MDHMT-IBR) (Reference no: MH/DMHMT/1/7/7 (88)) before collection of data.

Informed consent

Informed consent enables shared decision-making between the participant and the researcher (Pietrzykowski et al., 2021). As such, an explanation of the study purpose was given to the participants, and the researcher obtained their written consent. The participants were notified on the use of an audio recorder used to record the interview session proceedings and writing of field notes. In addition, a study information sheet was provided to each participant. In order for the participants to comprehend the goal of the study, the researcher gave the participant the information sheet to sure that they have enough time to read it. The researcher then obtain informed consent prior to the interviews, together with consent for allowing audio recording during study.

Confidentiality and anonymity

Code numbers were used during interviews and recording in data collection and reporting to ensure participant confidentiality and anonymity. Participants were assured that no information they submitted will be shared with unauthorized parties or published in a way that would expose their identity. In addition, participants' right to self-determination were upheld because participating in the study was voluntary and participants could leave at any time.

Beneficence

Polit and Beck (2017) assert that during the interview, participants must not experience negative feelings or be exposed to any harm. To prevent any uneasiness or discomfort, the interview was conducted in doctor’s office to provide privacy and comfort for the participants. Moreover, the researcher explained the purpose of the study and the method of data collection, and participants were informed to feel free to express themselves. The researcher displayed empathy and care to minimise participants’ distress during the interview. Additionally, social workers and counsellors were informed of the study and that there might be some emotional distress among study participants. This was to ensure that participants who became emotionally affected during the interview were to be attended to immediately, but such emotional experiences among participants were not encountered.

3.13 Conclusion

This chapter provided the research methodology and research design adopted for the study. The study employed a descriptive qualitative approach to explore the perspectives and experiences of non-intensive care nurses who provide mechanical ventilation to patients in Mahalapye District Hospital in Botswana. Ethical considerations adhered to during the research process are also described, as well as the research setting, data collection process and data analysis.

CHAPTER FOUR

FINDINGS

4.1 Introduction

This chapter presents the findings obtained from the interviews with non-intensive care trained nurses on their experiences and perceptions in caring for patients on mechanical ventilators. Participants' demographic information, themes and their subthemes are presented. To support the descriptions of the experiences and experiences drawn by the researcher direct verbatim quotations from the interview transcripts are provided, with true identities of participants replaced by pseudonyms letter P followed by a number.

4.2 Presentation of findings

In-depth interviews with eight non-intensive care trained nurses brought out their experiences and perceptions in caring for patients on mechanical ventilators. The findings are organized into major themes and subthemes that emerged from data analysis, ensuring that each theme align with the research question. A brief introduction is given for each theme, followed by a detailed exploration which is enriched by direct quotes from participants. The quotes illustrate and validate the interpretations made by researcher by offering authentic insights into the participants' lived experiences and perceptions, as stated by the participants.

The findings are systematically presented with major themes followed by related subthemes to ensure coherence and clarity. For example, in this study, the theme "Emotional burden and exhaustion in caring for patients on mechanical ventilators", includes subtheme: "Stress and burnout." This hierarchical presentation of themes and subthemes facilitates a logical flow of the findings, to enable readers to easily follow and understand the narratives. In addition, codes that indicate meaningful data segments where the sub theme and major themes were derived are incorporated in the presentation.

4.2.1 Socio-demographic characteristics of participants

Participants' demographic information comprised of gender, level of education, years of experience in nursing and years of experience involved in caring for patients on mechanical ventilators. Table 3 below shows summery of participants' socio-demographic characteristics.

Table 3: Non-intensive care trained nurses' characteristics

Characteristic	**Frequency**	**Percentage**
Gender:		
Male	1	12.5%
Female	7	87.5%
Level of education:		
Diploma	6	75%
Bachelor degree	2	25%
Master's degree	0	0%
Years of experience in nursing:		
1 to 5 years	1	12.5%
More than 5 years	7	87.5%
Years of experience involved in caring for patients on mechanical ventilators:		
1 to 5 years	2	25%
More than 5 years	6	75%

Table 3 above indicates that out of eight participants, most of the participants (87.5%) were females, with only one (12.5%) being male. Seven participants (87.5 %) had more than five years of work experience in nursing, and the remaining (12.5%) had less than five years experience. The majority of participants (75%) had over five years of experience caring for patients on mechanical ventilators, while the remaining two participants (25%) had less than five years of experience. In terms of qualifications, six participants (75%) held diplomas in nursing, and two (25%) held bachelor's degrees.

4.2.2 Emergent themes and subthemes

Five major themes and eleven sub-themes emerged from the data. Theme one, emotional burden and exhaustion in caring for patients on mechanical ventilators, was supported by sub-theme: stress and burnout. Theme two, perceived lack of knowledge and skills, and learning on the job, was supported by three sub-themes, namely: knowledge and skill gaps in ventilator management; coping strategies employed for knowledge and skill development; and the need for training and professional development. Theme three, resource and organisational challenges, was supported by the sub-themes; shortage of resources, and unsupportive work environment, while theme four, support and teamwork in ventilated patient care delivery, has two sub-themes; support and collaboration, and challenges in collaboration. Theme five, positive perceptions of caring for ventilated patients, and professional fulfillment was supported by two sub-themes; impact of positive patient outcomes, and professional growth and motivation. Table 4 below shows a summary of the experiences and perceptions, presented as major themes, sub-themes and their codes.

Table 4: Summary of themes, sub-themes and codes derived from the study

Major theme	Sub-theme	Codes
Emotional burden and exhaustion in caring for patients on mechanical ventilators	Stress and burnout	Emotional trauma due to patient deterioration and deaths. Stress from not meeting patient care needs when working alone. Stress and exhaustion caused by working long shifts. Physical and emotional exhaustion from caring for restless patients. Stress due to lack of resources and delays in accessing equipment. Stress due to lack of knowledge.
Perceived lack of knowledge and skills, and learning on the job	Knowledge and skill gap in ventilator management.	Lack of understanding of mechanical ventilator alarms. Difficulty in caring for ventilated patients due to lack of knowledge. Feeling helpless or intimidated by the lack of knowledge and skills.
	Coping strategies employed for knowledge and skill development	Self-directed learning and learning by observation. Positive but insufficient impact of orientation programs. Motivation to learn by caring for ventilated patients.
	Need for training and professional development	Emphasis on the need for regular, organised in-service training. Desire for ongoing training by specialised ICU nurses
Resource and organisational challenges.	Shortage of resource	Shortage of staff, equipment, and drugs. Inadequate infection control practices due to shortage of equipment. Delayed care provision due to insufficient staff and resources. Increased workload and stress from working alone
	Unsupportive work environment	Demotivating and depressing work environment due to inadequate support. Lack of support from management.

Support and teamwork in ventilated patient care delivery	Support and collaboration	Teamwork and support among nurses in caring for ventilated patients. Emotional and practical support from colleagues during challenging situations. Delayed responses from colleagues during emergencies.
	Challenges in collaboration	Stress due to delayed responses Perceived lack of support from management
Positive perceptions of caring for ventilated patients, and professional fulfillment.	Impact of positive patient outcomes.	Happiness and satisfaction when patients improve or recover. Perception of ventilator care as an opportunity to contribute meaningfully.
	Professional growth and motivation	Confidence gained through self-learning and seeking assistance. Determination and commitment to improve care delivery. Need for critical thinking and kindness in ventilated patient care.

Theme 1: Emotional burden and exhaustion in caring for patients on mechanical ventilators

The theme "Emotional burden and exhaustion in caring for patients on mechanical ventilators" describes emotional challenges faced by non-intensive care-trained nurses in the ICU when caring for patients on mechanical ventilators. Participants indicated that caring for patients on mechanical ventilators affects their emotional and mental well-being. Most participants described experiencing emotional distress, exhaustion, and feelings of inadequacy as they faced the challenges of providing care to critically ill, ventilated patients, who are often in a life-or-death situation. Participants described feelings of helplessness when they could not give the ideal care due to limited knowledge and skills and a shortage of resources, contributing to a sense of inadequacy. The responsibility of ensuring patient stability under high-pressure conditions often led to stress, with nurses reporting heightened anxiety about patient deterioration or unexpected complications. As a result, many nurses experienced emotional exhaustion and caring fatigue, especially after long shifts and when faced with overwhelming caseloads. These emotional burdens were compounded by a perceived lack of emotional support from supervisors, which contributed to a sense of isolation in dealing with the psychological toll of their work.

While these emotional impacts were largely negative, most of the nurses expressed emotional resilience, developing coping strategies to manage their stress and prevent burnout. Positive coping mechanisms included seeking peer support and swapping shifts so that the emotionally burdened nurse could have a break from the work environment. Despite the difficulties, nurses also acknowledged moments of personal growth, feeling a deep sense of purpose in their role in caring for ventilated patients despite the emotional challenges. This theme is composed of the sub-theme stress and burnout.

Sub-theme 1: Stress and burnout

The sub-theme "Stress and Burnout" reflects the overwhelming psychological toll that non-intensive care trained nurses experience when caring for patients on mechanical ventilators. Nurses described the constant pressure of managing critically ill patients, often without sufficient training and support, leading to heightened stress levels. Many participants expressed feeling mentally and emotionally drained, with some reporting symptoms of burnout due to long shifts, excessive workloads, and the emotional strain of the job. The lack of adequate coping mechanisms and institutional support exacerbated these feelings, contributing to a sustained state of stress and exhaustion. Most of the participants reported experiencing emotional trauma, especially when the patient's condition deteriorated and died under their care. Seeing changes in the patient's condition and death caused emotional trauma for most participants. Some participants stated that:

> *"Caring for ventilated patients is very painful and stressful. It causes us a lot of emotional pain. You will find that yes, some patients are very sick, but others you will have hope that the patient will be weaned off the ventilator, only to find that the patient passed away the next day when you come for duty; it is heartbreaking. P2.*

Participants expressed emotional conflict as a result of the usage of physical restraints, even though they are often necessary to manage restless patients on mechanical ventilators. Most participants reported discomfort when restraining restless, non-sedated patients, perceiving it as adding more suffering to an already critically ill patient.

“Imagine someone is critically ill, and I tie his hands; it is stressful and traumatising to me emotionally because I feel like I am being cruel to the patient; I feel for the patient, but on the other hand, I have to do it to prevent the patient from removing the endotracheal tube.” P6.

“Patients, if they are not too restless, who can become calm, I closely observe, but for others who are too agitated and restless, I physically restrain the patient to prevent them from removing the endotracheal tube, but I do not like restraining a patient; it appears as if I am being cruel to someone who is sick, and it stresses me,” P1.

Participants further reported working alone most of the time, which made them unable to meet patients’ care needs. This was expressed as causing stress among participants, especially during emergencies when assistance was needed. One participants commented:

"It becomes very painful and stressful for me when I do not meet the nursing activities for patients because of being alone. When the patient dies, more especially, I feel stressed thinking that maybe I could have helped the patient better” P4.

Some participants expressed self-blame, especially after the death of the patient cared for. The emotional response resulted from different challenges experienced during the care of ventilated patients, including shortage of staff, lack of knowledge and skills, and shortage of equipment, which were expressed by participants as leading to delayed and inadequate care provision for ventilated patients, particularly during emergencies. Some participants reported that:

“I experience anxiety with the feeling of guilt that maybe the patient could have benefitted from my care if I knew well how to work with the ventilator,” P5.

“Being alone when the critical patient condition changes is very stressful because I will be knowing what to do, but there will always be a need for help from someone in carrying out some intervention, for instance, resuscitation. So I end up having self-blame at the end, especially after the patient has died. I feel like maybe I could have done better in helping the patient," P7.

Stress and exhaustion were reported by most of the participants as a result of working long shifts, working alone in a shift, and a shortage of resources. Caring for restless patients was also expressed as causing emotional and physical exhaustion among the participants. As a result of the exhaustion, participants expressed inadequate care provision to the ventilated patients. Some participants stated that:

> *"We are short-staffed, so when we have a ventilated patient and other critically ill patients, it is draining and exhausting, because we work beyond the shift, taking extended hours. Working long shifts makes me tired, and in the end, care becomes minimal," P2.*

The shortage of resources and delays in accessing necessary equipment during emergencies, compounded by a lack of knowledge and skills, were expressed as causing stress for the participants.

> *"It is very stressful when I avail myself and my mind to care for patients in an environment that has limited resources, which makes my work difficult. It gives stress when the patient condition changes and I have to use the equipment, but it is not readily available for immediate use," P3.*

In addition, the absence of emotional support by the hospital was also expressed as contributing to feelings of isolation by participants in caring for the critically ill ventilated patients. One participant commented that:

> *"There is no organised support to help us deal with the daily stresses were experience in caring for the critically ill ventilated patient. We go through a lot of stress here; it is not easy for us seeing patient deteriorate and dying every time," P8.*

Theme 2: Perceived lack of knowledge and skills, and learning on the job

Non-intensive care trained nurses, when newly allocated to the ICU to provide care for critically ill patients, including those on mechanical ventilators, are taken through an orientation programme in order to equip them with the knowledge and skills required. Participants expressed perceptions of their knowledge and preparedness in caring for patients on mechanical ventilators. Most participants expressed a lack of knowledge and skills and had employed some learning strategies to enhance their knowledge in ventilated patient care. However, participants further expressed the need for structured training to enhance their competence and confidence in caring for ventilated patients. This theme is explained with subthemes; knowledge and skills gaps in ventilator management, learning and development strategies, and need for training and professional development.

Sub-theme 1: Knowledge and skill gaps in ventilator management

The subtheme "knowledge and skill gaps in ventilator management" highlights the specific areas where non-intensive care trained nurses feel unprepared or lack the necessary expertise to manage mechanical ventilators effectively. It focuses on the critical gaps in both theoretical knowledge and practical skills required to operate ventilators safely and efficiently in a high-pressure clinical environment. Most participants reported a lack of understanding of the ventilator alarms and how to intervene in response to the alarms, which hindered their ability to provide care effectively for the ventilated patients. Some participants stated that:

> *"I still have limited understanding and knowledge of operating the ventilator. For instance, when the ventilator alarms, at times, I do not understand the meaning of the alarm and how to intervene" P1.*

The lack of knowledge and skills was expressed as compounded by the complexity of ventilated patient care especially in instances where by the patient was restless. Participants expressed relying on seeking assistance from colleagues to overcome the difficulties encountered in caring for ventilated patients.

> *"The patient will be restless to an extent that some even remove the endotracheal tube. That is very risky for the patient. It is not easy caring for a patient who is restless. For me to manage such I call other nurses to assist" P4.*

> *"I still have limited understanding and knowledge of operating the ventilator. For instance, when the ventilator alarms, at times, I do not understand the meaning of the alarm and how to intervene. So most of the time during my care for these patient I call for assistance from my colleagues where I am not sure of what to do" P2.*

This sense of lack of knowledge and skills was expressed by participant's hesitation to perform some nursing procedures on ventilated patients such oral care due to fear of complications like dislodging the endotracheal tube, resulting in inadequate care provision. One participant commented:

"I feel I do not know most of the things about care of a ventilated patient. For instance I cannot perform oral care for patients on mechanical ventilator, I have fear dislodging the endotracheal tube. Patients stay for a long time without oral care because of our lack of skill" P4.

Lack of knowledge and skills was reported as causing delays in care provision for patients on mechanical ventilators because of having to seek assistance instead of taking immediate interventions to the patient. Participants further expressed that a lack of skills and knowledge in operating the ventilator and responding to ventilator alarms caused a sense of inadequacy and helplessness. This is exemplified by the following statements:

"There are instances whereby the ventilator gives an alarm, and I am not able to understand what the alarm means and what to do. There is always a delay in asking for help, and by that time I have anxiety seeing that I am delaying helping the patient," P4.

"There are times when the response from my colleagues' takes time, and in such times I feel helpless," P5.

Frequently seeking assistance from colleagues was perceived as important for the safety of the patient but also contributed to feelings of embarrassment. One participant stated that:

"I find it better to get help so that I can be able to do the right thing for the patient than to put the patient at risk, but at times I feel embarrassed by calling for help every time," P2.

Sub-theme 2: Coping strategies employed for knowledge and skill development

The orientation that the participant went through on allocation to work in ICU was expressed to have been helpful in in introducing basic concepts on care of ventilated patients, but most participants reported that it was insufficient in helping them to develop the skills required to care for patients on mechanical ventilators. As a result, non-intensive care-trained nurses expressed having engaged in self-directed learning by reading online materials, watching educational videos, reviewing shared guidelines, and seeking assistance and guidance from colleagues to enhance their understanding. In relation to this some participants stated:

"The orientation though was not detailed for me to understand some of the things, it was good that it gave me the basics of operating the ventilator and patient care" P8.

"The orientation teaching did not equip me well with knowledge and skills needed for care of ventilated patients" P4.

This inadequate training and lack of knowledge was described by some participants as leading to them not being able to perform some nursing activities on ventilated patients. One participant commented:

"There are some procedures that need to be done on a ventilated patient, like, for instance, oral care, which I cannot do because I have not received any demonstration, and I have not practiced. So this lack of skills makes it difficult for me to be able to meet some of the patients' needs because I do what I understand and feel competent in doing," P8.

However, in the absence of adequate orientation training, participants described their efforts to learn through seeking assistance from colleagues, observation, and self-directed learning to develop their skills and improve knowledge in caring for patients on mechanical ventilators. Participants further expressed having gained competence and confidence as a result of learning by themselves and emphasised the importance of continuous learning in caring for ventilated patients. Some participants commented:

"Having realised that I need to have knowledge and skills to understand care for ventilated patients, I was prompted to read and learn more about mechanical ventilation, and this has helped me to be able to care for patients on mechanical ventilators. Mostly I learnt through watching you tube and reading online articles. Sometimes my colleagues share guidelines they find online, and these guidelines are easy to follow and very helpful," P6.

"I learnt and gained some skills through observing experienced nurses and asking questions where I am stuck and not knowing what to do" P1.

Sub-theme 3: Need for training and professional development

The sub-theme "Need for training and professional development" highlights non-intensive care-trained nurses' desire for organised, continuous training opportunities to address their ventilator management knowledge and skill gaps. It highlights the participants' recognition that, while orientation programmes are helpful, they are insufficient to fully prepare them for the complexities of ventilated patient care. Non-intensive care-trained nurses expressed the need for ongoing professional development through regular in-service training with hands-on practical demonstrations by skilled personnel and exposure to more advanced ICU environments in referral hospitals. They felt that these training possibilities would enhance their competence, improve patient outcomes, and improve their confidence when caring for critically ill ventilated patients. Some participants commented:

> *"We need ongoing training, even if it is not taking us to school but organising on-the-job training like workshops by specialised personnel like ICU nurses who know more about the care of ventilated patients or being taken for orientation in referral hospitals where the ICU is of a higher level so that we gain knowledge and skills from the trained people there. It could help us gain more knowledge and skills and feel confident in our patient care," P3.*

> *"We need training regularly, even if it can be organised in-service training by a specialised ICU nurse," P1.*

Participants further expressed a desire for hands-on practical demonstrations with the guidance of specialised ICU nurses to enhance their skills in caring for ventilated patients. One participant *commented:*

> *"We need proper training, even if it is just on-the-job training by specialised ICU nurses who can take us through the processes of ventilated patient care with some demonstrations so that we gain understanding and skills," P5.*

Theme 3: Resource and organizational challenges

Theme 3, "Resource and organisational challenges," highlights the significant challenges faced by non-intensive care-trained nurses in providing care for mechanically ventilated patients. Shortage of resources was expressed as the main challenge encountered in caring for patients on mechanical ventilators. Most participants reported a lack of adequate staffing, essential equipment, and supportive management, which they expressed as hindering their ability to deliver optimal nursing care towards the ventilated patients. These constraints and being unable to provide optimum care for the patients contributed to the emotional and physical strain on the non-intensive care-trained nurses. As a result, they perceived the work environment as demotivating and unsatisfying due to their inability to provide the level of care they deemed necessary, further affecting their ability to provide optimal nursing care. Subthemes that emerged under this theme include shortage of resources and an unsupportive work environment.

Sub-theme 1: Shortage of resources

The sub-the "shortage of resources" describes the resources challenges encountered by non-intensive care trained nurses in caring for patients on mechanical ventilators. It highlights the impact of the shortage of resources on non-intensive care trained nurses care provision towards ventilated patients. Most participants reported the shortage of resources, including staffing, equipment, and drugs, which were expressed as hindering provision of optimum care for the ventilated patients.

Most participants reported working alone during shifts, caring for ventilated patients and other critically ill patients. This working alone in a shift was reported as leading to non-intensive care trained nurses working extended hours in order to complete the nursing tasks, which led to experiencing of fatigue, and at the end providing inadequate care to the patients. Some participants made the following comments:

> *"We work most of the time one nurse per shift so it is exhausting especially when there are many patient in the ward. This makes us not to care for our patient properly and it puts those on the ventilator at risk. When we have ventilated patient and other critically ill patients it is draining and exhausting, because we work beyond the shift taking extended hours," P2..*

Participants reported experiencing shortage of critical equipment and drugs which hindered their ability to provide adequate care to patients on mechanical ventilators. The lack of necessary equipment often lead to inadequate infection control practices, putting patient's safety at risk. In relation to these some participants stated that:

> *"In caring for a ventilated patient we require supplies like ventilator tubing, suction machine and drugs, but we are experiencing shortage of these equipment and drugs,"P3.*

> *"We experience shortage of equipment like suction machine and suction tubes, ventilator tubing, and drugs which help during care of ventilated patients so we have to improvise a lot. Ventilator tubing and suction tubes need to be autoclaved after use, so we end up not autoclaving them, we only clean and disinfect them so that they are available for next use. This compromises patient care," P1.*

Most participants reported delay in patient care provision due to shortage of staff and equipment. Participants expressed that working alone hindered effective care provision towards patients, as it makes them not to be able to meet all the patient's needs. Participants indicated that they are unable to perform some critical nursing care activities on ventilated patients effectively without assistance. Some participants made the following comments:

> *"Other nursing care activities that need to be performed on patients become difficult as we work one nurse in a shift. Caring for a ventilated patient requires at least having another person who can assist in performing some activities on patients, like for instance oral care, you will find that it is not performed on ventilated patients because of the nurse being alone on a shift," P7.*

> *"Being alone in a shift and having to call for assistance from someone outside the ward delays patient care. For instance resuscitation to be done effectively needs at least two people, but most of the time I find myself starting it alone and continuing until the doctor arrives," P8..*

Increased workloads as a result of working alone was reported by most participants. Participants expressed that workload resulted in physical exhaustion making it difficult to meet all patient's care needs adequately. Most participants further expressed experiences of emotional distress due to the realization that they give more attention to ventilated patients than to other patients, which led to feeling of guilt and stress In relation to this some participants stated that:

> *"When there are other patients in the ward, most focus will be on the ventilated patient and other patients not attended to that much as required. At the end some of the nursing activities to such patients like position change or feeding are mostly not performed well in time. It is exhausting even if I try to prioritise my duties as you will find that it is like I am being tossed around by care provision towards the patients, at the end some activities I do not manage to perform," P7.*

> *"Working alone in a shift also makes work difficult, and is one of the big challenge here. It makes me feel tired and when tired like that I cannot adequately meet all the patients care needs. Working alone compromises our patient care and delays the care I have to give the patient," P8.*

Sub-theme 2: Unsupportive work environment

This sub-theme describes non-intensive care-trained nurses' perception of the work environment as unsupportive due to persistently facing a shortage of staff and equipment and lack of knowledge, which hindered adequate patient care provision. The lack of adequate support from management compounded these challenges as the non-intensive care-trained nurses felt they were left to cope with overwhelming workloads and limited knowledge and skills in caring for ventilated patients. This situation led to feelings of frustration and helplessness, resulting in demotivation. These challenges were expressed as making work not satisfactory, which led to inadequate care provision towards the ventilated patients. One participant stated:

> *"Challenges make us grow in our daily work experiences but if they are persistent and becoming more like the way they are here, we end up being stressed and this prevents us from providing optimum care to the patients as we would like to. It is exhausting and makes work unsatisfactory. These challenges demotivate us, I should be motivated to go for work and should not feel like I am going to that ICU which stresses," P1.*

In addition to the challenges experienced participants reported lack of support from management which compounded the stress experienced in caring for ventilated patients. Some participants reported:

> "*There is no support from management more especially in the issue of staff shortage, and I feel management do not understand what we are going through as we care for patients here, they should organize formal in-service training for us," P3.*

> *"We are passing through a lot of pain and stress as we care for these patients, so I think management is not giving us enough support, they should see the need to take us through training and ensure adequate supply of equipment," P1.*

Theme 4: Support and teamwork in ventilated patient care delivery

This theme highlights the critical role of teamwork and support among non-intensive care-trained nurses in delivering effective care for patients on mechanical ventilation. Participants emphasised that collaborative efforts and emotional support are vital in overcoming the challenges experienced in ventilated patient care, thereby enhancing their ability to provide quality patient care provision.

However, the theme also reveals challenges that non-intensive care-trained nurses faced when support was not available, particularly in emergency situations. This theme is explained by subthemes: support and collaboration, and challenges experienced during collaboration.

Sub-theme 1: Support and collaboration

Most participants expressed that they rely on each other for assistance during ventilated patient care. Participant reported that due to their lack of knowledge and skills they are available for each other, assisting and guiding each other in patient care difficulties, and during emotional experiences resulting from ventilated patient care. This support and collaboration was attributed to participants desire to help meet the ventilated patient care need and provide optimum patient care. Some participants made the following comments:

> *"There is good teamwork and support among us, always available for each other to help and assist. We understand to an extent caring for ventilated patients so working as a team brings different knowledge and makes us gain more skills and competence, what I don't understand the other person understands, so we share knowledge," P1.*

> *"When I face difficulty on not knowing what to do I call other nurses who are not on duty for assistance on what to do and it is helping us. We support each other when it comes to patient care" P3.*

Participants also expressed emotional support among them which was reported as helpful in the relief of some emotional distress experienced. Some participants reported that talking to colleagues helped them manage the emotional burden of caring for the critically ill ventilated patients. In addition, participants indicated that they swapped shifts in order to provide emotional relief for colleagues who experienced a stressful shift.

> *"I talk to my colleagues about my encounters and how I feel. We share and discuss our experiences and this helps me to feel relieved. Sometimes we swap the shifts so that the nurse who had a bad experience takes a break away from work, this support among ourselves is very helpful," P8.*

Participants further reported that they support each other through sharing learning material and guidance to enhance each other's knowledge. One participant commented:

"Support from my colleagues as I ask for help also helps a lot, they are very supportive and we work as a team. We share information and videos among ourselves that we see relevant for us in caring for patients on mechanical ventilators," P5.

Sub-theme 2: Challenges in collaboration

The subtheme "challenges in collaboration" highlights that while teamwork was the strength for non- intensive care trained nurses, there were some difficulties encountered during collaboration in caring for ventilated patients. Participants expressed that while teamwork was generally present, it was not always consistent, especially in emergency situations. Delays in response for assistance and lack of support from management were reported. Most participant reported experiencing delays in response from colleagues when seeking assistance which resulted in feeling of stress especially during emergencies. Some participants commented:

"There are times when the response from my colleagues takes time, and in such times I feel helpless. It is very stressful especially when the patient's condition changes and I am in need of help" P5.

"We call nurses from theatre and they do come to help though is not always because they are most of the time held up with the patients, and we also call the doctor from accident and emergency. It is stressful to handle an emergency alone for that moment of time awaiting help," P7.

Most participants expressed concerns about the lack of support from management in their care for ventilated patients. One participants commented that:

"I think management is not giving us enough support, they should see the need to take us through training and ensure adequate supply of equipment," P1.

Theme 5: Positive perceptions of caring for ventilated patients and professional fulfilment

This theme describes professional fulfilment and positive perceptions from caring for patients on mechanical ventilation experienced by non-intensive care trained nurses, despite the challenges encountered. As non-intensive care-trained nurses are aware of how their dedication and compassion impacted their patients' well-being, helping to improve the patient's condition gave them a sense of purpose and made the difficult job of caring for ventilated patients more rewarding Participants expressed a sense of professional fulfilment and positive perceptions from caring for patients on mechanical ventilation.

Sub-theme 1: Impact of positive patient outcomes

The sub theme "impact of positive patient outcomes" describes non-intensive care-trained nurses'responses towards improve patient outcomes during their care for ventilated patients. Participants reported experiencing happiness and satisfaction when the patient's condition improved. Most participants expressed that when a patient is weaned off the ventilator, it is emotionally uplifting and indicated their effort in providing effective care to the ventilated patients. One participant commented:

> *"Caring for ventilated patients at times gives joy, especially when the patient gets weaned off and recovers. I feel like, yes, I have played a part in this patient's care, and I become happy," P7.*

The sense of achievement was expressed as a validation for their efforts in ventilated patient care, and appreciation from the patient's relatives reinforced their view of the efforts they bring in providing care for the ventilated patients.

> *"When the patient's condition improves and relatives appreciate the care we provide, it makes me see the importance of my role in caring for the ventilated patient, and I also feel being valued," P7.*

Participants perceived caring for ventilated patients as an opportunity to make a meaningful contribution to patient outcomes, recognising the roles they play in caring for ventilated critically ill patients.

Sub-theme 2: Professional growth and motivation

The sub-theme "professional growth and motivation" highlights how the difficulties of ventilated patient care inspired non- intensive care trained for self-improvement and determination for effective patient care. The need for advanced knowledge and skills required for caring for ventilated patients and the non-intensive care trained nurses' desire to provide optimum patient care motivated them to improve their skills in caring for the ventilated patients.

Participants reported that caring for ventilated patients contributed to their professional growth and motivation. Most participants found motivation in learning by themselves and collaborating with colleagues. Learning by self and actively seeking assistance and guidance from colleagues in caring for ventilated patients was expressed as important in building skills, confidence, and competence in caring for the ventilated patients. In relation to this, some participants made the following comments:

"Caring for a ventilated patient is interesting because it prompts me to read further, and it keeps one alert all the time when on duty to be ready to respond at any time," P3.

"With time, through learning from literature and teaching others, I have gained knowledge and skills, and I have confidence in caring for patients on mechanical ventilation," P7.

Participants viewed caring for ventilated patients and having to learn by themselves as a means of strengthening their resilience and learning critical care nursing skills.

In addition, participants reported determination and commitment to improve care delivery.

"Reading more on mechanical ventilation to improve my knowledge also helps give me confidence in my care towards the ventilated patients," P5.

"I try my best in caring for these patients and do my nursing care with all my heart for better outcomes for the patients," P2.

The participants also realised the importance of critical thinking and kindness in caring for patients on mechanical ventilators to provide holistic patient care.

"To take care of a ventilated patient needs knowledge and understanding of what you are supposed to do and what you are doing on the patient and the ventilator every time. It is a kind of work that requires a good heart and alertness because this patient is critically ill and depends on us and the ventilator. So it is a challenging job that needs the whole me when I am on duty," P7.

4.3 Conclusion

The in-depth interviews with non-intensive care-trained nurses revealed that they experienced emotional and psychological stress, a shortage of resources, support, and teamwork. Non-intensive care-trained nurses perceived themselves as having limited knowledge and skills and lacked support from management. The experiences and perceptions were expressed as affecting their ability to provide quality patient care as well as affecting their emotional and physical well-being. Nevertheless, these nurses reported resilience and commitment to providing effective patient care, with the report of satisfaction when having positive patient outcomes.

CHAPTER FIVE

DISCUSSION OF FINDINGS

5.1 Introduction

This chapter discusses the findings from the study on the experiences and perceptions of non-intensive care-trained nurses in caring for patients on mechanical ventilators in Mahalapye District Hospital in Botswana. The discussion is structured around the findings from the study and integrating relevant literature to provide an understanding of the experiences and perceptions of non-intensive care trained nurses in their role of caring for ventilated patients. The findings are compared with existing literature to provide a comprehensive understanding of the study results, with each theme discussed in detail. Similarities and differences with other study findings from the literature are brought up in the discussion of the findings.

The discussion in this chapter comprises of socio-demographic characteristics of the participants, emergent themes, and implications of the study findings to the nursing practice, nursing education, nursing administration, and nursing research. Recommendations, strengths and limitations of the study and how the findings will be disseminated and utilized are also presented.

5.2 Socio-demographic characteristics of non-intensive care trained nurses

The study included eight participants, predominantly female, with varying levels of education and experience in both nursing and ventilated patient care. Education plays a fundamental role in nursing competence, with several studies suggesting that advanced education enhances adherence to best practices. Alhamad and Elsayed (2024) and Getahun et al. (2022) reported that nurses with higher educational qualifications demonstrated better compliance with ventilator-associated pneumonia (VAP) prevention protocols. Similarly, Elhabashy et al. (2024) and Hashish et al. (2020) emphasized that baccalaureate-prepared nurses exhibited higher competency levels, greater confidence, and a proactive approach to learning. However, in this study, nurses with both diploma and bachelor's degrees reported similar challenges, such as knowledge deficits and the need for additional training, suggesting that academic qualifications alone may not fully prepare nurses for the complexities of ventilated patient care. This underscores the importance of continuous training and hands-on experience in developing essential skills.

Clinical experience is another key factor in nursing proficiency. While previous research suggests that more experienced nurses tend to demonstrate higher competency and readiness in managing ventilated patients (Shibiru et al., 2023; Cheng, 2024), the findings of this study indicate that years of nursing experience did not significantly influence participants' perceived competence. Even those with extensive nursing experience expressed challenges in caring for ventilated patients, highlighting the need for specific critical care training rather than relying solely on general nursing experience. Additionally, Alhamad and Elsayed (2024) noted that nurses with at least six years of experience and prior ICU exposure showed better adherence to VAP prevention measures. The absence of such a distinction in this study suggests that hands-on ICU exposure is more impactful than general years of nursing experience alone.

Gender differences in perceptions and experiences were minimal in this study, with the single male participant reporting similar challenges and coping mechanisms as the female participants. This aligns with existing literature, which suggests that while gender may influence specific stressors in nursing, clinical competency is largely shaped by education, experience, and training rather than gender alone (Lee & Kang, 2020).

Overall, the findings of this study emphasize the need for targeted training programs that go beyond formal education and general nursing experience. While higher education and years of practice can contribute to competency, the challenges faced by non-intensive care-trained nurses in managing ventilated patients highlight the necessity of structured orientation programs, continuous professional development, and hands-on learning opportunities. These measures can bridge the existing knowledge and skill gaps, ultimately improving the quality of care provided to ventilated patients.

5.3 Emotional burden, and exhaustion in caring for patients on mechanical ventilators

The care of mechanically ventilated patients presents significant emotional and psychological challenges for non-intensive care-trained nurses. This study highlights the profound impact of the demanding and high-pressure nature of this responsibility on non-intensive care-trained nurses' mental health and emotional well-being. The findings revealed that non-intensive care-trained nurses frequently experience stress and burnout due to the high physical and emotional demands of caring for ventilated patients. These findings align with previous studies that reported stress, anxiety, depression, moral distress, and burnout as common occupational risks for nurses working in high-pressure environments, such as intensive care units (Al-Rjoub et al., 2022; Woo et al., 2020). Stress levels among non-intensive care-trained nurses were exacerbated by the long working hours, inadequate staffing, and insufficient training to care for critically ill ventilated patients.

In particular, inadequate staffing was highlighted as causing more stress and burnout, with non-intensive care-trained nurses often working alone in the shift, finding themselves providing care for the ventilated patients and other critically ill patients alone in the ICU. This finding is consistent with Torre, Popper, and Bergesio (2019), who reported that a nurse-patient ratio exceeding 1:3 significantly increases burnout risk; this study further revealed that the lack of appropriate staff compromises both nurse well-being and patient care quality. Similarly, Galanis et al. (2023) and Lasater et al. (2021) noted that understaffing negatively affects job satisfaction and raises turnover intentions among ICU nurses. Study participants reported that shortage of staff resulted in increased workloads, which led to non-intensive care-trained nurses experiencing stress. Studies by Turan et al. (2020) and Alrabae et al. (2021) reported that prolonged exposure to excessive workloads leads to emotional exhaustion, decreased tolerance, and feelings of inadequacy. These increased work demands not only impair nurses' mental health but also compromise patient safety and the overall quality of care provided to ventilated patients (Aprilia et al., 2019; Banda et al., 2022).

The emotional toll of witnessing patient deterioration and death was a significant source of distress for non-intensive care-trained nurses. The findings revealed that frequent exposure to patient deaths often led to feelings of overwhelm and fatigue, which was consistent with prior studies by Munyanziza et al. (2021), and Bolado et al. (2024). The emotional trauma associated with death and dying was compounded by the non-intensive care-trained nurses’ limited knowledge and skills in managing critically ill ventilated patients, as these nurses were unable to intervene well in time to meet the ventilated patients' care needs.

5.4 Perceived lack of knowledge and skills, and learning on the job

Caring for ventilated patients presents significant challenges for non-intensive care-trained nurses due to the complexity of mechanical ventilation and the specialised skills required. The findings of this study revealed that non-intensive care-trained nurses experience significant knowledge and skill gaps when managing ventilated patients. Participants reported challenges in understanding ventilator alarms, operating ventilators, and performing essential nursing procedures such as oral care due to fear of complications. These findings are consistent with previous studies that have highlighted knowledge deficits regarding mechanical ventilation among nurses. For instance, Hassen et al. (2023) reported that the majority of nurses working in intensive care units had poor knowledge of mechanical ventilation. Similarly, Getahun et al. (2022) and Zeb et al. (2018) reported that many ICU nurses had inadequate knowledge and skills related to the prevention of ventilator-associated pneumonia in ventilated patients.

The lack of critical skills and knowledge needed to manage mechanical ventilators effectively has led to an increased dependence on colleagues for guidance and support. This is in line with findings by Mukuve and Nuuyoma (2023), which indicated that ICU nurses relied on learning from more experienced colleagues to enhance their understanding and competency in ventilator care. The complexity of ventilated patient care, particularly when managing restless ventilated patients, further exacerbates the difficulties faced by non-intensive care-trained nurses. Limbu et al. (2019) similarly reported that ICU nurses without proper training experienced significant stress and had to rely on experienced colleagues for support in performing certain procedures. Furthermore, non-intensive care-trained nurses in this study reported being unable to perform specific procedures, such as oral care, due to limited skills and the fear of dislodging the endotracheal tube. This is consistent with findings by Sreenivasan et al. (2018), who reported that ICU nurses hesitated to provide oral care to intubated patients due to fear of tube dislodgement and lack of cooperation from patients. Insufficient nursing knowledge can negatively impact patient care, leading to delays in interventions and potential complications. Getahun et al. (2021) emphasised that sufficient nursing knowledge is crucial for optimal patient care, improved decision-making, and better patient outcomes.

The limited knowledge and skills among the non-intensive care trained nurses lead to these nurses experiencing profound feelings of helplessness when caring for mechanically ventilated patients. The limited knowledge and skills in managing mechanical ventilators, contributed to delays in care provision, which intensified feeling of helplessness and inadequacy. These findings align with Gordon et al. (2021) and Yousif et al. (2024), who reported that critical care nurses often experience fear, worry, anxiety, stress, helplessness, and empathy due to concerns about their patients' well-being. The inability to provide optimal care due to knowledge gaps may cause a feeling of low nurses' confidence and perceived incompetence in handling critical situations in caring for ventilated patients. In addition, as non-intensive care-trained nurses frequently provided care for critically ill and ventilated patients, witnessing patient deterioration and death can cause feelings of empathy for both the patient and their relatives. This empathy, while essential for compassionate care, can lead to an overwhelming sense of helplessness. Dijxhoorn et al. (2021**)** reported that ICU nurses felt they lacked the necessary skills or resources to make a meaningful difference in patient care. Lima et al. (2023) emphasised that inadequate training and insufficient support hinder nurses' ability to deliver quality care, further exacerbating emotional and psychological distress. Due to the realisation of their limited knowledge and skills, which hinders the provision of adequate ventilated patient care, participants in this study reported that they need continuous education by qualified ICU personnel and professional support to bridge these knowledge gaps.

Despite these challenges of lack of knowledge and skills reported in this study, the study findings indicated that non-intensive care-trained nurses adopted proactive strategies to enhance their knowledge and skills. These strategies included self-directed learning through watching educational videos, reading online materials, and observing experienced colleagues. These efforts align with the findings by Yoo et al. (2020), who reported that ICU nurses learnt effective communication skills by observing experienced peers and actively seeking knowledge from books and videos.

The orientation programme provided to non-intensive care-trained nurses was acknowledged as valuable; however, participants expressed dissatisfaction with its depth and comprehensiveness. Contrary to this, studies by Lalithabai et al. (2021) and Pertiwi et al. (2019) reported that orientation programmes were perceived as informative, comprehensive, and educational, enhancing nurses' knowledge and skills in patient care. The study findings by Caronia et al. (2018) underscore the importance of continuous peer support and collaborative learning in improving nurses' competencies in high-acuity settings.

Learning from colleagues was identified as a significant coping strategy, with participants highlighting the supportive role played by their peers in sharing knowledge and guidelines. This aligns with the findings of Gundo et al. (2019), who reported that mentorship and informal learning within ICU teams contribute to improved confidence and competence among critical care nurses. Moreover, the non-intensive care-trained nurses in this study strongly emphasised the need for structured, ongoing training and professional development. They expressed a desire for regular in-service training, hands-on practical sessions, and exposure to advanced ICU environments in referral hospitals. These findings align with findings by Caronia et al. (2018), which reported that continuous education and professional development are essential for enhancing nurses' competencies in specialised care settings. Similarly, studies by Seam et al. (2019) and Lalithabai et al. (2021) reported that structured training programs, including simulation-based learning, significantly improve nurses' preparedness and confidence in managing ventilated patients.

The findings indicate that while non-intensive care-trained nurses face considerable knowledge gaps in ventilator management, they employ various informal learning strategies to improve their competence. However, there they reported the need for structured, ongoing training to bridge these gaps and ensure high-quality care for ventilated patients.

5.5 Resource and organisational challenges

The study revealed that a lack of resources, including staffing, essential equipment, and drugs, significantly hindered non-intensive care-trained nurses' ability to provide adequate care to ventilated patients. Most participants reported working alone during shifts, which led to extended working hours, physical fatigue, and emotional distress. This finding aligns with studies by Vahedian-Azimi et al. (2019), Alharbi and Alshehry (2019), and Darawad and Feddeh (2020), which reported that staffing shortages in critical care units resulted in increased workloads, fatigue, and burnout among nurses. These conditions could be attributed to contributing to inadequate ventilated patient care provision by the non-intensive care-trained nurses, as their physical and emotional well-being was negatively affected. Participants noted that working alone made it challenging to meet all patient needs, particularly in emergencies, where delays in care provision were reported. This is supported by findings by Yoon (2022), who reported that low staffing levels are directly linked to delayed care interventions, increased patient readmissions, and higher mortality rates in ICUs. Additionally, studies by Al-Faouri et al. (2021), Smith et al. (2018), and Park et al. (2018) emphasised that staffing shortages and resource inadequacies contribute to increased missed care, further supporting the findings of this study.

The study findings revealed that a shortage of critical equipment, such as ventilator tubing, suction machines, and suction tubing, emerged as a major barrier to providing safe and effective care. Participants reported delayed interventions due to limited equipment and reusing and sharing equipment between patients, which compromised infection control standards. Studies by Bolado et al. (2024) and Mousazadeh et al. (2019) reported that insufficient medical equipment in ICUs led to work disruptions, delayed care, lack of care, compromised patient safety, and high levels of stress among ICU nurses.

The findings of this study also align with study findings of Kakemam et al. (2020) and Nantsupawat et al. (2022), who reported that resource shortages in ICUs contribute to delayed care interventions, increased risk of complications, and diminished patient satisfaction, while Nantsupawat et al. (2022) reported that higher patient-to-nurse ratios and poor resource adequacy were associated with higher rates of missed care and adverse patient outcomes. Conversely, Lake et al. (2020) reported that improved nurse staffing and resource availability significantly reduced missed care, highlighting the critical role of resources in ensuring quality care provision towards ventilated patients.

In addition to resource shortages, the non-intensive care-trained nurses reported an unsupportive work environment as a significant challenge faced in caring for ventilated patients. Participants perceived the lack of management support in addressing resource constraints and providing training as contributing to their stress and demotivation. This aligns with findings by Mukuve and Nuuyoma (2023), who reported that ICU nurses often cited a lack of managerial support in addressing staffing and resource shortages as a key issue affecting their work.

Participants expressed frustration and emotional distress arising from their inability to meet patient care needs due to limited resources, knowledge, and skills. They reported feelings of guilt and stress over their perceived failure to provide adequate care, particularly when prioritising ventilated patients over other critically ill patients. Similar findings were reported by Kelly et al. (2021), who reported that ICU nurses experiencing persistent workplace challenges without adequate support were more likely to suffer from emotional exhaustion, decreased job performance, and increased absenteeism.

The unsupportive work environment also contributed to delays in critical care interventions, as participants were often required to seek assistance from outside their ward or improvise due to limited resources. Participants expressed dissatisfaction with their work environment, noting that these persistent challenges hindered their ability to provide the level of care they deemed necessary. These findings are consistent with studies by Kakemam et al. (2020) and Mousazadeh et al. (2019), which reported that resource constraints in ICUs contribute to delays in care, increased risk of complications, and decreased patient satisfaction.

Resource shortages and an unsupportive work environment led to emotional and physical strain among non-intensive care-trained nurses. Participants reported working extended hours and experiencing fatigue, which affected their ability to perform essential nursing activities, such as oral care and timely interventions. The emotional burden of prioritising one patient over others contributed to feelings of guilt and stress, further impacting their job satisfaction and performance. Studies by Bolado et al. (2024) and Mousazadeh et al. (2019) similarly reported that resource constraints and inadequate support systems in ICUs lead to high levels of stress, emotional exhaustion, and dissatisfaction among nurses. These challenges ultimately compromise patient care and contribute to adverse outcomes, as highlighted by Nantsupawat et al. (2022).

5.6 Support and teamwork in ventilated patient care delivery

The study identified teamwork and collaboration as critical enablers for non-intensive care-trained nurses in providing effective care for ventilated patients. Participants reported relying on their colleagues for practical and emotional support, as well as for sharing knowledge and skills. These findings align with studies by Baek et al. (2023) and Zeleníková et al. (2020), which emphasised that peer support in high-stress environments, such as intensive care units, enhances nurses' competence and confidence. Collaborative efforts allowed non-intensive care-trained nurses to compensate for gaps in knowledge and skills, ensuring that care is well-coordinated and patient-focused.

The study also highlighted how teamwork fostered a culture of mutual learning and professional development among non-intensive care-trained nurses. Sharing knowledge and learning materials among colleagues was a common practice reported by participants, which aligns with Kjällquist-Petrisi and Hommel (2021), who reported that peer learning improved clinical skills and patient outcomes in critical care settings. Similarly, Gundo et al. (2019) reported that ICU nurses acquired essential knowledge and skills through self-directed learning and observation of colleagues, which is similar to the experiences of the non-intensive care-trained nurses in this study.

In addition to improving clinical competence, collaboration among non-intensive care-trained nurses was reported to provide emotional support, which was reported as helpful in mitigating the stress of caring for critically ill ventilated patients. Studies by Friganović et al. (2021) and Carvello et al. (2019) emphasised the importance of emotional support among colleagues in reducing work-related stress and promoting resilience in high-pressure work environments. Moreover, Elbejjani et al. (2020) reported that effective teamwork supports optimal nurse and patient outcomes, reduces burnout, and improves job satisfaction. The findings of this study indicated that collaborative efforts among non-intensive care-trained nurses were essential in promoting their well-being, as most participants frequently reported shared emotional experiences and seeking practical guidance as helpful during their care for ventilated patients.

Despite the benefits of teamwork, this study also revealed challenges in collaboration among non-intensive care-trained nurses in caring for ventilated patients. Participants reported delays in response when seeking assistance, particularly during emergencies, which increased their stress levels and compromised patient care. A study by Salameh et al. (2024) supports this finding, indicating that delayed response times towards ventilator alarms by critical care nurses negatively affect patient outcomes by delaying timely interventions required to prevent adverse outcomes in the ventilated patient. Delayed responses when non-intensive care-trained nurses seek assistance during emergencies were reported as causing delayed interventions, which can have a negative impact on patient safety, contributing to increased non-intensive care-trained nurses' stress.

The study findings also revealed that non-intensive care-trained nurses expressed concerns about the lack of management support. The absence of structured training programs on ventilated patient care was identified as a significant barrier to effective practice. This finding aligns with studies by Gundo et al. (2019), which highlighted the critical need for ongoing education and training in ICUs. Without adequate training as recommended by the participants, non-intensive care-trained nurses may feel unprepared to manage the complexities of ventilated patient care, which could lead to frustration and decreased job satisfaction over time in their care for ventilated patients.

Management support is critical for creating an enabling environment for nurses. Rivaz et al. (2017) emphasised that supportive nursing management is associated with increased job satisfaction, improved performance, and better patient outcomes. Conversely, as reported by participants in this study, a lack of organisational support can contribute to absenteeism and job dissatisfaction (Mousazadeh et al., 2018).

5.7 Positive perceptions of caring for ventilated patients and professional fulfilment

Despite the numerous challenges associated with caring for ventilated patients, non-intensive care-trained nurses experience a sense of professional fulfilment and positive perceptions from their roles. Their dedication and compassion towards improving patient outcomes provide them with a sense of purpose and accomplishment. The findings of this study indicated that non-intensive care-trained nurses derived a sense of happiness and satisfaction when they witnessed positive patient outcomes, such as successful weaning from a mechanical ventilator. Seeing patients improve reinforced their sense of achievement and validated their efforts in providing care. Similar findings have been reported by Mukuve and Nuuyoma (2023), who reported that ICU nurses experienced job satisfaction when patients responded positively to care and were successfully discharged.

Moreover, appreciation from patients' relatives further enhanced non-intensive care-trained nurses' perceptions of their role, strengthening their commitment to delivering quality care. Non-intensive care-trained nurses reported feeling valued when their efforts were recognised, fostering a greater sense of professional identity and morale. This aligns with the findings of Bäcklund et al. (2018), which reported that positive patient responses contribute to nurses' job satisfaction, making them feel rewarded for their work.

The study findings highlight that the challenges associated with ventilated patient care motivated non-intensive care-trained nurses for professional growth. Non-intensive care-trained nurses reported that their experiences inspired them to seek additional knowledge and skills to enhance their competency in ventilated patient care. This observation is supported by study findings by Jiménez-Herrera (2020) and Ayalew et al. (2021), which reported intrinsic motivation as a key factor influencing job performance and professional satisfaction among nurses in caring for critically ill patients. Participants in this study reported commitment to professional development by actively seeking to learn through literature, online resources, and peer support to gain knowledge and skills required for optimal ventilated patient care provision. These proactive strategies align with findings by Yoo et al. (2020), which reported that ICU nurses improved their communication skills and knowledge by observing experienced colleagues and engaging in self-directed learning. The complexity of ventilated patient care requires nurses to be vigilant, proactive, and emotionally prepared, which non-intensive care-trained nurses were determined to develop for the provision of quality patient care by engaging in self-directed learning and learning from colleagues.

5.8 Conclusion

This chapter discussed the findings of the study on the experiences and perceptions of non-intensive care-trained nurses in caring for mechanically ventilated patients at Mahalapye District Hospital in Botswana. The findings revealed the challenges faced by these nurses, including emotional and psychological stress, knowledge and skill gaps, resource and organisational constraints, and the critical need for support and teamwork. Despite these challenges, non-intensive care-trained nurses demonstrated resilience and proactive learning strategies to enhance their knowledge and skills in caring for ventilated patients. However, non-intensive care-trained nurses expressed the need for training in caring for ventilated patients and support from management to enhance their competence and well-being, for the provision of adequate quality care towards the ventilated patients.

5.9 Implications of this study to critical care nursing

The experiences and perceptions of non-intensive care-trained nurses in caring for mechanically ventilated patients have significant implications for various aspects of nursing. These implications can drive improvements in critical care nursing practice, education, management, and research, ultimately enhancing the quality of care for ventilated patients, especially by non-intensive care-trained nurses.

5.9.1 Nursing practice

This study highlighted that non-intensive care trained nurses experience both physical and emotional stress in caring for ventilated patients which result from various challenges encountered such as lack of knowledge and skills, shortage of resources including staff and equipment. Addressing the challenges could have significant implications for critical care nursing practice. The need to equip non-intensive care-trained nurses with the skills to manage ventilated patients underscores the importance of addressing knowledge and skill gaps through structured protocols and training. This can minimize stress associated with knowledge deficits, and improve the quality of nursing care by reducing delayed care and improve the safety of ventilated patients under the care of non-intensive care trained nurse

Additionally, the emotional toll experienced by nurses emphasizes the necessity of implementing stress-reduction interventions, counseling services, and peer support programs to promote emotional well-being which was reported as leading to inadequate ventilated patient care provision

Furthermore, addressing resource shortages is essential to ensure adequate staffing, equipment, and medication availability, which are critical for effective patient care. Together, these efforts can help mitigate the impact of challenges on nursing practice, enhance patient outcomes, and create a more supportive work environment for the non-intensive care trained nurses.

5.9.2 Nursing Education

The findings of this study highlight the need for training by non-intensive care trained nurses in caring for ventilated patients. Nursing education programmes should incorporate critical care-tailored training programmes in the general nursing curriculum which would prepare nursing students for care of the ventilated patients in ICUs. These programmes should focus on essential areas such as ventilator management, infection control, and ventilated patient care nursing procedures, utilizing simulation-based learning to enhance competency and confidence. Additionally, strengthening orientation programs for nurses transitioning into ICU settings can ensure they are adequately prepared to care for ventilated patients by providing foundational knowledge and critical skills. In addition, continuous professional development is also crucial, with regular in-service training, refresher courses, and ICU exposure at referral hospitals to help nurses stay updated on best practices. Beyond clinical skills, the study underscores the importance of emotional resilience training within the nursing curriculum. Incorporating modules on stress management and coping strategies can better prepare nurses for the psychological challenges of working in critical care settings, to equip them with improving their well-being and ability to provide high-quality patient care.

5.9.3 Nursing management

From a management perspective, the findings of this study emphasize the critical role of effective workforce planning and resource allocation to address the challenges faced by non-intensive care-trained nurses in ICUs. Nursing managers must advocate for improved nurse-patient ratios to prevent burnout and ensure better patient outcomes. A key priority should be creating an enabling work environment where nurses feel supported, valued, and equipped with knowledge and skills to provide optimal care. This includes addressing resource shortages, and providing training for the non-intensive care trained nurses on allocation for ICU. Additionally, nursing management should take a proactive approach to policy development and enforcement, focusing on adequate staffing, resource availability, and clear protocols for ventilated patient care. By ensuring these measures are in place, nursing leaders can build a resilient workforce capable of delivering high-quality care even in challenging circumstances

5.9.4 Nursing research

The study finding provide insight on areas of research in nursing. Future research should focus on exploring the emotional and psychological impact of caring for ventilated patients examining the causes of stress and burnout, and identifying interventions to promote resilience and well-being. Additionally, investigating the effectiveness of tailored training and orientation programs for non-ICU-trained nurses can provide evidence to guide the design of more impactful educational strategies. Innovative approaches such as virtual reality simulations, e-learning modules, and interdisciplinary training programs also present exciting opportunities for research, offering modern solutions to bridge knowledge and skill gaps in ventilated patient care. Through these efforts, nursing research can contribute to developing evidence-based strategies that improve both nursing practice and ventilated patient outcomes in ICUs.

5.10 Recommendations from the study

Based on the findings of this study, the following recommendations are proposed to address the challenges experienced by non-intensive care trained nurses in caring for ventilated patients, to enhance the quality of care provided by these nurses to improve patient outcomes, as well as improve their confidence, well-being, and professional satisfaction.

5.10.1 Enhance training and professional development

Ministry of health, and hospital administrators should provide ongoing specialized training for non-intensive care trained nurses focused on the care of mechanically ventilated patients to help improve their knowledge and skills towards complex care. Ongoing training would mitigate knowledge gaps and prevent missed care of the ventilated patients. Training could be delivered through structured workshops, simulation exercises, and online learning platforms to make education more accessible.

Nursing managers should develop comprehensive orientation programmes for non-intensive care trained nurses transitioning into ICU settings. These programmes should cover basic critical care concepts, mechanical ventilation protocols, and emergency management of ventilated patients. This would ensure enhanced preparation which could improve non-intensive care trained nurses' confidence and competence in ventilator management.

5.10.2 Supportive work environment

Hospital administrators and nursing managers should improve staffing ratios and ensure that ICUs have adequate resources, including suction machines and medications, to reduce the workload burden, enabling non-intensive care trained nurses to provide quality care while reducing stress and burnout among them.

Hospital administrators and nursing managers should implement stress reduction interventions, such as providing access to counselling services and debriefing sessions after critical incidents. Such programs can help reduce emotional exhaustion and improve job satisfaction among non-intensive care trained nurses, thereby improving the provision of adequate quality care.

5.10.3 Standardised protocols and policies

The Ministry of health should establish standard operating procedures and care protocols for ventilated patients should be established and implementation be monitored. These guidelines should be easy to follow and address key areas such as ventilator alarm management, infection control, and weaning protocols.

Hospital administrators and nursing management must ensure these protocols are supported by the necessary resources, staff training, and regular audits to monitor adherence.

5.10.4 Advocacy for management support

Non-intensive care trained nurses should have open communication with supervisors and ICU specialists to raise concerns and seek assistance when needed. Open communication could help reduce feelings of isolation and foster a culture of support.

Nurse managers must advocate for policy changes at the organizational level to ensure appropriate nurse-to-patient ratios in ICU to help ensure that patient care needs are met without overburdening non-intensive care trained nurses, thereby improving patient outcomes and non-intensive care trained nurses' job satisfaction.

5.11 Plan for dissemination and utilisation of findings

The study findings will be disseminated to different stakeholders to promote the implementation of the recommendations that are made. A hard copy will be submitted to the UNZA School of Nursing Sciences and Main Library in order to contribute academic information and enrich students learning experiences. A hard copy will also be given to the Ministry of Health (Botswana), as the results could be helpful in informing policymakers in the ministry about evidence-based decision-making in policy formulation. This could lead to a potential improvement in nursing care for mechanically ventilated patients, especially care provision by non-intensive care-trained nurses.

Summary reports will be submitted to Mahalapye District Hospital so that health care providers can have access to evidence-based information that they can use to improve the care of patients on MV. The result could help health care providers more, especially in MDH ICU, in formulating protocols, which could help non-intensive care trained nurses in their roles in caring for ventilated patients.

Articles will be publicized in peer-reviewed journals, potentially with the International Journal of Nursing and the Journal of Clinical Nursing. This could help ensure that the study is evaluated by experts in the field of critical care nursing and research to validate its scientific integrity. In addition, publicising in journals could also help contribute to the findings being accessed by researchers globally, thereby contributing to the body of knowledge in nursing care of mechanically ventilated patients.

Study findings will also be presented at conferences, such as the International Conference on Critical Care Nursing, African Conference on Emergency and Critical Care Nursing, and Zambia Health Research Conference. This could help the researcher network with other researchers, discuss study findings, and receive feedback, which could help identify areas for improvement in conducting a study. Regional conferences could help in sharing study findings in the region in which contexts specific to the provision of nursing care to patients on MV by non-intensive care trained nurses will be shared and discussed. This could help in improving nursing care for patients on MV by non-intensive care trained nurses in the region through collaboration and the development of strategies based on evidence in the region.

5.12 Strengths and limitations of the study

5.12.1 Strengths

The study addresses a critical gap in the health care system in Botswana by exploring the experiences and perceptions of non-intensive care trained nurses caring for mechanically ventilated patients, especially looking at the increasing demand for ICU care and ventilated patient care due to increasing disease burden. The study findings highlighted the challenges experienced by these nurses which serve as evidence for policymakers and healthcare administrators to design strategies aimed to improving care provision by non-intensive care trained nurses especially in the context of Mahalapye District hospital. It highlights specific areas where improvements are needed in caring for ventilated patients, such as the need for training and skill development, staffing, resource allocation, teamwork and collaboration and the need for support by management.

The study provides actionable recommendations to improve training, support, and working conditions for non-intensive care nurses, which can lead to improved patient care and professional well-being of the non-intensive care trained nurses

The study followed qualitative approach which allowed for an in-depth exploration of the lived experiences of non-intensive care trained nurses in caring for ventilated patients, which revealed their emotional challenges, practical challenges, and coping mechanisms employed in overcoming the challenges with aim of providing optimum ventilated care. The use of interviews provided rich, detailed data giving a voice to the participants in expressing their experiences and views in their role of caring for ventilated patients.

The study captures real-world challenges faced by non-intensive care trained nurses in critical care environment in Mahalapye District hospital where they do not have the specialized training required for complex care of patients on mechanical ventilation. As such, the findings reflect practical realities and provide a foundation for developing tailored interventions and policies which can be used to improve the quality of patient by the non-intensive care trained nurses, and improved patient outcomes.

5.12.2 Limitations

The study was conducted in MDH hospital with a small sample size which could mean that the experiences and perceptions of non-intensive care trained nurses working in advanced ICUs and those in referral hospitals, are underrepresented due to the difference in setting and practice. To mitigate this limitation the researcher made some efforts to enhance transferability by providing a detailed description of the study setting, participants, and data collection process. Future studies could use a larger sample size, and incorporate quantitative methods to strengthen the generalizability of the findings

The study might have had potential for response bias as participants were aware that the study focused on their experiences and perceptions, some may have adjusted their responses to align with what they believed the researcher wanted to hear or may have withheld certain information due to fear of judgment. These could lead to an incomplete or inaccurate representation of non-intensive care trained nurses' true experiences and challenges in caring for ventilated patients. To reduce bias, the researcher established rapport with participants before the interviews, emphasized confidentiality, and reassured them that their honest experiences were valuable for improving patient care. Future research could use different study designs such as mixed methods to complement qualitative interviews and reduce potential bias

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APPENDICES

APPENDIX A: Participants information sheet

Study title: Experiences and Perceptions of non-intensive care trained nurses in caring for patients on mechanical ventilator in Mahalapye District Hospital, Botswana

Investigators: Gabarate Bohutsana, University of Zambia School of Nursing Sciences

Phone: 260975928267/ +26775602135

Email: ratidintsi@gmail.com

Background and rationale for the study:

Mechanical ventilation is a common treatment for critically ill patients, with (90%) of patients globally requiring it. Botswana, like other sub-Saharan African countries, is experiencing a rise in critical illnesses, and consequently need for MV in ICUs. Most ICUs often use a team nursing model, involving allocation of non-intensive care trained nurses who also provide care for critically ill patients including those on MV (Nakweenda et al., 2022). Non-intensive care trained nurses perform several specialised duties which are almost the same as for critical care nurses, including paying attention to key aspects such as endotracheal tube management, monitoring of ventilator settings, and maintaining optimal oral hygiene (Juliana et al., 2021; Maddumage et al., 2017). Hence this study aims to explore the experiences and perceptions of non-intensive care trained nurses in caring for patients on mechanical ventilators in Mahalapye District Hospital in Botswana. The findings could inform healthcare policymakers and administrators to improve safety and quality of nursing care for ventilated patients.

The insights and experiences that will be given by the non-intensive care trained nurses in this study could be valuable in the development of healthcare policies and standards of care for ventilated patients. The findings could help inform national healthcare policymakers and administrators to recognise the positive experiences and challenges encountered by non-intensive care trained nurses, the contributing factors, and the support they require in caring for ventilated patients. This could serve as the foundation for developing appropriate strategies such as standardised protocols and guidelines that improve safety and quality of nursing care provided by non-intensive care-trained nurses and consequently, enhance patients' outcomes.

Purpose:

The purpose of the study is to explore the experiences and perceptions of non-intensive care-trained nurses regarding their care provision for patients on MV, in order to inform the development of targeted interventions for nurses that will improve patient outcomes and safety in ICUs. The participants are therefore asked to take part in the study in order for them to provide insight in how they view and experience care of ventilated patients.

Procedures:

You are invited to take part in the study. In participating, the study will address you as a non-intensive care trained nurse. To participate in the study, you are required to offer your consent by signing to affirm your willingness to take part. An interview will be conducted, and with your permission, the interview will be recorded and transcribed at the end of the interviews. The researcher will also be taking notes during the interview. All the information collected will be kept in a lockable cupboard and will only be accessible by the researcher. When participating, you are not expected to give your names.

Who will participate in the study?

Non-intensive care trained nurses who have cared for patients on mechanical ventilator for at least one year in Mahalapye District Hospital in Botswana, who are willing to participate

Risks/Discomforts:

There will be no experience of discomfort and risks in participating in the study. However, your input into the study will require some of your time and effort

Benefits:

The study has no direct benefits to you as a participant. However information you provide will be important in contributing to better understanding of the experiences and perceptions of non-intensive care trained nurses in caring for mechanically ventilated patients which could help in developing targeted strategies that improve nursing care of patients on mechanically ventilated patients.

Cost:

The participants will not incur any costs during the study.

Compensation for participation in the study:

There is no compensation for participating in the study. However participants injured during the course of the study will be assisted by the researcher to ensure that they receive medical assistance and optimal care. Participants who may suffer permanent damage will be ensured that the participant receive necessary medical care and the researcher to cover all medical expenses related to the injury.

Reimbursement:

The study will take place in the ICU and no cost will be incurred by the participants.

Statement of voluntariness:

Participating in the study is voluntary, and as a participant, if you no longer want to continue with the study, you can withdraw at any time without stating any reason.

Confidentiality:

The results of this study will be kept strictly confidential and used only for research purposes. Participants' identities will be concealed as far as the law allows. The name will not appear anywhere on the coded forms with the information, and participants will remain anonymous in the published results of this study. Paper and computer records will be kept under locked cabinets and with password protection respectively.

Questions about participants rights:

Participants who have questions about their rights during their participation in the study can have their queries addressed to contacts provided below.

Ethical approval:

If you need clarification on ethical approval, please contact the University of Zambia Biomedical Research Ethics Committee.

Telephone: +260977925304 Ridgeway Campus

Telegrams: UNZA, LUSAKA P.O. Box 50110

Telex: UNZALU ZA 44370 Lusaka, Zambia

Fax: + 260-1-250753

E-mail: unzarec@unza.zm

Federal Assurance No. FWA00000338 IRB00001131 of IORG0000774 NHRAR-REC No 2021-05-0002.

Persons to contact for queries

If you have any questions about your participation in this study process you should contact;

Gabarate Bohutsana, researcher. School of Nursing. Phone: +260975928267/ +26775602135

Email: ratidintsi@gmail.com

Dr Ruth Wahila, supervisor. School of Nursing. Phone: +260975971620.

Email: ruth.wahila@unza.zm

Mr Lyambai Kestone, co-supervisor. School of Nursing Phone: +260 (977)458595

Email: kestone.lyambai@unza.zm

APPENDIX B: Consent form for participation in the study

Study title: Experiences and perceptions of non-intensive care trained nurses in caring for patients on mechanical ventilators in Mahalapye District Hospital, Botswana

Consent form for participation in the study

I ……………………………………. (Name) give my consent to participate in the research study. I have read and understood the study information provided, and was given the opportunity to ask questions. I hereby volunteer to participate in the study.

Date ……………………...   Signature ……………………

APPENDIX C: Consent for audio recording during the study interview

Study title: Experiences and perceptions of non-intensive care trained nurses in caring for patients on mechanical ventilators in Mahalapye District Hospital, Botswana

Consent for audio recording during the study interview

I………………………………………. ……….. (Name), hereby give my consent that I have been informed about the purpose of audio recording for this interview for the study title: Experiences and perceptions of non-intensive care trained nurses in caring for patients on mechanical ventilators.

Date………………………………….   Signature………………………………..

APPENDIX D: Socio-demographic data

Study title: Experiences and perceptions of non-intensive care trained nurses in caring for patients on mechanical ventilators in Mahalapye District Hospital, Botswana

Demographic data

Please place X at the correct answer or fill in the correct answer where required in the questions below.

What is your gender?

Male	
Female	

What is the level of your level of education?

Diploma	
Bachelor degree	
Master degree	

How long have you been working in an Intensive Care Unit?

………………………………………………………………

How many years of experience in nursing?

………………………………………………………………

How many years have you been involved in caring for patients on mechanical ventilators?

…………………………………………………………….....

APPENDIX E: Interview guide

Study title: Experiences and perceptions of non-intensive care trained nurses in caring for patients on mechanical ventilators in two district hospitals in the Central District of Botswana.

Interview schedule questions

Questions on experiences in caring for patients on mechanical ventilators.

Core question: What have been your experiences of providing care for patients on mechanical ventilators?

Probes:

1. Can you describe a typical day when you are caring for a mechanically ventilated patient?
2. What specific challenges have you encountered while providing care to ventilated patients?
3. How do you feel when caring for patients on mechanical ventilation?
4. Can you share any experiences where you felt particularly confident or unprepared in managing a ventilated patient?
5. What strategies have you used to overcome challenges in caring for these patients?
6. How has caring for ventilated patients affected your emotional and psychological well-being?
7. Have you received any formal or informal training to help you in this role? If so, how has it influenced your experience?
8. What kind of support do you receive from colleagues and management when caring for ventilated patients?
9. Can you describe a situation where teamwork played a role in your experience of caring for ventilated patients?
10. How do you ensure patient safety and comfort while caring for a mechanically ventilated patient?

Questions on perceptions in caring for patients on mechanical ventilators.

Core question: Can you tell me about how you perceive caring for patients on mechanical ventilators?

Probes:

1. How do you feel about your role in caring for ventilated patients?
2. Do you perceive caring for ventilated patients as different from other patients' care? If so, in what ways?
3. What aspects of caring for ventilated patients do you find most rewarding?
4. What aspects of caring for ventilated patients do you find most challenging?
5. How confident do you feel in your ability to care for a mechanically ventilated patient?
6. How do you think your knowledge and skills impact the quality of care you provide to ventilated patients?
7. In your opinion, what additional training or resources would enhance your ability to care for ventilated patients?
8. Do you think non-intensive care-trained nurses should be involved in caring for ventilated patients? Why or why not?
9. How does caring for ventilated patients impact your professional growth and motivation?
10. What recommendations would you give to improve the experience of non-intensive care-trained nurses in caring for ventilated patients?

APPENDIX F: Permission request letter to conduct the study

Gabarate Bohutsana
P. O. Box 134
Ramokgonami, Botswana

8 July 2024

The Chairperson

Biomedical Research Ethics Committee

University of Zambia

P.O. Box 50110

Lusaka

U.f.s: The Dean, School of Nursing Sciences

Assistant Dean Post-graduates, School of Nursing Sciences

Dear Sir/Madam

RE: Application for ethics clearance of a research proposal.

This communiqué provides information on the subject topic mentioned above. I am a student pursuing Master of Science in Critical Care Nursing, and to meet the programme criteria I am required to conduct a research study. In light of this, I am submitting the study proposal on the topic: Experiences and perceptions of non-intensive care trained nurses in caring for patients on mechanical ventilators in Mahalapye District Hospital in Botswana, for your review and approval to move on to the following phase.

I hope my application will considered.

Yours faithfully

Gabarate Bohutsana

Cell: +267 75602135/+260 975928267

Email: ratidintsi@gmail.com

APPENDIX G: Request letter to research and development division

Gabarate Bohutsana
P. O. Box 134
Ramokgonami, Botswana

13 September 2024

The Chairperson
Research and Development Division
Ministry of Health
Private Bag 0038
Gaborone, Botswana

U.f.s: The Dean, University of Zambia School of Nursing Sciences

Dear Sir/Madam

Re: Request to conduct a study in Mahalapye district hospital

This communiqué provides information on the subject topic mentioned above. I am a student pursuing Master of Science in Critical Care Nursing, and to meet the programme criteria I am required to conduct a research study. In regard to this, I am submitting the study proposal on the topic: Experiences and perceptions of non-intensive care trained nurses in caring for patients on mechanical ventilators in Mahalapye District Hospital in Botswana, for your evaluation and consent to proceed to the next stage.

I hope my application will be considered.
Yours faithfully

Gabarate Bohutsana
Cell: +267 75602135/+260 975928267
Email: ratidintsi@gmail.com

APPENDIX H: Request letter to research board

The University of Zambia
School of Nursing Sciences
P.O. Box 50110
Lusaka, Zambia

2 October 2024

Head of Research Board
Mahalapye DHMT
P.O. Box 49
Mahalapye, Botswana

U.f.s: The Dean, University of Zambia, School of Nursing Sciences

Dear Sir/Madam

RE: Request to conduct a research study at Mahalapye District Hospital ICU.

This communiqué provides information on the subject topic mentioned above. I am a student pursuing Master of Science in Critical Care Nursing, and to meet the programme criteria I am required to conduct a research study. In regard to this, I am submitting the study proposal on the topic: Experiences and perceptions of non-intensive care trained nurses in caring for patients on mechanical ventilators in Mahalapye District Hospital in Botswana, for your evaluation and consent to proceed to the next stage.

I hope that my application will be considered.
Yours faithfully

Gabarate Bohutsana
Cell: +267 75602135/+260 975928267
Email: ratidintsi@gmail.com

APPENDIX I: Approval letter from UZABREC

UNIVERSITYOFZAMBIA

BIOMEDICALRESEARCHETHICSCOMMITTEE

Telephone: +260 977925304 Ridgeway Campus Telegrams: UNZA, LUSAKA P.O. Box 50110 Telex: UNZALU ZA 44370 Lusaka, Zambia

Fax: + 260-1-250753 E-mail: unzarec@unza.zm

Federal Assurance No. FWA00000338 IRB00001131 of IORG0000774 NHRAR-REC No 2021-05-0002

9th September, 2024

Your REF. No. 5588-2024

Gabarate Bohutsana,

University of Zambia,

School of Nursing Sciences,
P.O Box 50110, **Lusaka.**

Dear Sir/Madam,

RE: EXPERIENCES AND PERCEPTIONS OF NON-INTENSIVE CARE TRAINED NURSES IN CARING FOR PATIENTS ON MECHANICAL VENTILATORS IN MAHALAPYE DISTRICT HOSPITAL, BOTSWANA (REF. NO. 5588-2024)

The above-mentioned research proposal was presented to the Biomedical Research Ethics Committee on 4th September, 2024. The proposal is **approved**. The approval is based on the following documents that were submitted for review:

a) Study proposal
b) Questionnaires
c) Participant Consent Form

APPROVAL NUMBER : REF. No. 5588-2024.

This number should be used on all correspondence, consent forms and documents as appropriate.

i. **APPROVAL DATE : 9th September 2024**
ii. **TYPE OF APPROVAL : Standard**
iii. **EXPIRATION DATE OF APPROVAL : 8th September 2025**

iv. After this date, this project may only continue upon renewal. For purposes of renewal, a progress report on a standard form obtainable from the UNZABREC Offices should be submitted one month before the expiration date for continuing review.

v. **SERIOUS ADVERSE EVENT REPORTING**: All SAEs and any other serious challenges/problems having to do with participant welfare, participant safety and study integrity must be reported to UNZABREC within 3 working days using standard forms obtainable from UNZABREC.

vi. **MODIFICATIONS**: Prior UNZABREC approval using standard forms obtainable from the UNZABREC Offices is required before implementing any changes in the Protocol (including changes in the consent documents).

vii. **TERMINATION OF STUDY**: On termination of a study, a report has to be submitted to the UNZABREC using standard forms obtainable from the UNZABREC Offices.

viii. **NHRA:** You are advised to obtain final study clearance and approval to conduct research in Zambia from the National Health Research Authority (NHRA) before commencing the research project.

ix. **QUESTIONS**: Please contact the UNZABREC on Telephone No. +260977925304 or by e-mail on unzarec@unza.zm.

x. **OTHER**: Please be reminded to send in copies of your research findings/results for our records. You are also required to submit electronic copies of your publications in peer-reviewed journals that may emanate from this study. Use the online portal: unza.rhinno.net for further submissions.

Yours sincerely,

Munsaka.

Prof. Sody Mweetwa Munsaka, BSc., MSc., PhD

CHAIRPERSON

Tel: +260977925304

E-Mail: s.munsaka@unza.zm

APPENDIX J: Approval letter from HRDC

TELEPHONE: 363 2500
FAX: 317 0155
TELEGRAMS: RABONGAKA
TELEX: 2818 CARE BD

REPUBLIC OF BOTSWANA

MINISTRY OF HEALTH
PRIVATE BAG 0038
GABORONE

REFERENCE NO: HPRD: 6/14/1 **25th September 2024**

Health Research and Development Committee

Notification of IRB Review: **New application**

Gabarate Bohutsana
P o Box 134
Ramokgonami

Dear Gabarate Bohutsana

RE: EXPERIENCES AND PERCEPTIONS OF NON-INTENSIVE CARE TRAINED NURSES IN CARING FOR PATIENTS ON MECHANICALVENTILATOR IN MAHALAPYE DISTRICT HOSPITAL, BOTSWANA, VERSION 7.0. DATE: 12/09/2024.

Type: Expedited Review/Health Research and Development Division
Review Date: 23th September 2024
Approval Date: 25th September 2024
Effective Date: 25th September 2024
Expiration Date: 24th September 2025
Risk Determination: Minimal risk

Thank you for submitting new application for the above referenced protocol. **The permission is granted to conduct the study. Approval is for academic fulfillment only.**

This permit does not however give you authority to collect data from the selected sites without prior approval from the management. Consent from the identified individuals should be obtained where applicable.

The research should be conducted as outlined in the approved proposal. Any changes to the approved proposal must be submitted to the Health Research and Development Division in the Ministry of Health for consideration and approval.

Furthermore, you are requested to submit at least one hardcopy and an electronic copy of the report to the Health Research, Ministry of Health within 3 months of completion of the study. Approval is for academic fulfilment only. Copies should also be submitted to all other relevant authorities.

Continuing Review

In order to continue work on this study (including data analysis) beyond the expiry date, submit a Continuing Review Form for Approval at least three (3) months prior to the protocol's expiration date. The Continuing Review Form can be obtained from the Health Research Division Office (HRDD), Office No. 7A.7 or Ministry of Health website: www.moh.gov.bw or can be requested via e-mail from HRDD office, e-mail address: hhealthresearch@govbots.onmicrosoft.com. As a courtesy, the HRDD will send you a reminder email about eight (8) weeks before the lapse date, but failure to receive it does not affect your responsibility to submit a timely Continuing Report form.

Amendments

During the approval period, if you propose any change to the protocol such as its funding source, recruiting materials, or consent documents, you must seek HRDC approval before implementing it. Please summarize the proposed change and the rationale for it in the amendment form available from the Health Research Division Office (HRDD), Office No. 7A 7 or Ministry of Health website: www.moh.gov.bw or can be requested via e- mail from HRDD Office, e-mail address: hhealthresearch@govbots.onmicrosoft.com. In addition submit a copy of an updated version of your original protocol application showing all proposed changes in bold or "track changes".

Reporting

Other events which must be reported promptly in writing to the HRDC include:

- Suspension or termination of the protocol by you or the grantor
- Unexpected problems involving risk to subjects or others
- Adverse events, including unanticipated or anticipated but severe physical harm to subjects.

If you have any questions please do not hesitate to contact Mr. Abia Sebaka at asebaka@gov.bw, Tel +267-3632754 and Mr. K. Motlhanka at kgmmotlhanka@gov.bw, Tel +267-3632751.

Thank you for your cooperation and your commitment to the protection of human participants in research.

Yours Sincerely

MINISTRY OF HEALTH RESEARCH DIVISION
25 SEP 2024
P/BAG 0038, GABORONE
HEALTH POLICY RESEARCH & DEVELOPMENT

Ms. Tebogo Kelapile
for/Permanent Secretary