Perceptions of Critical Care Nurses on Staff Shortages in Intensive Care Units at Princess Marina Hospital, Gaborone, Botswana

By

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A dissertation submitted to the University of Zambia in partial fulfilment of
the requirements for the award of a degree of Master of Science in Critical Care Nursing

The University of Zambia
Lusaka

2025

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ABSTRACT

Staff shortages in intensive care units are a critical issue affecting healthcare systems worldwide. The shortage of nurses in intensive care units can lead to adverse outcomes for both patients and healthcare providers, particularly in resource-constrained settings such as Princess Marina Hospital in Gaborone, Botswana. Shortage of critical care nurses can significantly impact the perceptions of these nurses towards their profession and the broader healthcare system, leading to concerns about workload, job satisfaction, safety, career development, and systemic issues within healthcare delivery. It was, therefore, of utmost importance that critical care nurses' perceptions of staff shortage were investigated to create not only a dialogue but action to improve the situation. The aim of the study was to explore the perceptions of critical care nurses on staff shortages in the intensive care unit at Princess Marina Hospital, Gaborone, Botswana. A case study design was employed. Data were collected through unstructured in-depth interviews with 10 critical care nurses and observations using a checklist within the intensive care unit. Data were analyzed using thematic analysis following Braun and Clarke's six steps of analysis. The findings revealed four themes and eleven subthemes. The first theme, compromised quality of patient care was informed by three subthemes namely; delayed responses to patient needs, reduced monitoring of patients, and increased risk of errors. The second theme, physical and psychological impact on the nurse consists of three subthemes. In the third theme, ineffective coping strategies, three subthemes emerged and include over-reliance on overtime, Minimal use of support systems, and abuse of sick leaves. The fourth theme is role of adequate staffing in patient care which has two subthemes, specifically improved patient outcomes and enhanced nurse well-being. Staff shortages in the intensive care unit have a profound effect on both patient care and the well-being of critical care nurses. It is essential to increase the number of nursing staff in the intensive care unit to ensure adequate nurse-to-patient ratios. This will help reduce the workload on individual nurses, allowing them to provide more comprehensive and timely care. Implementing policies to recruit and retain more critical care nurses can mitigate the adverse effects of staff shortages on patient care and nurse well-being.

Key words: Perceptions, Critical care nurses, ICU staff shortages, Challenges, Coping strategies, Patient care quality.

ACKNOWLEDGEMENT

First and foremost, I extend my heartfelt gratitude to Almighty God for providing me with the strength, hope, and wisdom to persevere during my studies, especially during moments of weakness.

I owe a debt of appreciation to my dedicated supervisors, Dr. Ruth Wahila and Mrs Phadaless P. Sinkamba, for their precious guidance, endless patience, and firm support throughout this academic journey and equipping me with the necessary research skills

I would like to acknowledge funding from the Ministry of Health Botswana. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

I am deeply grateful to the Medical Superintendents of Princess Marina Hospital for permitting me to conduct this study at their esteemed facility. Their cooperation was invaluable to the success of this research.

To my parents and my siblings, I extend my profound appreciation for your firm understanding, support, prayers, and constant words of encouragement. Their love and support have been my pillars throughout this journey.

DEDICATION

I dedicate this study to my beloved parents who have been a constant source of love, encouragement, and solid support throughout my academic journey. Their boundless faiths in my abilities and enduring love have been the driving force behind my pursuit of knowledge and the successful completion of this study.

Thank you for your sacrifices, prayers, and the countless words of encouragement that have propelled me forward during both the challenging and rewarding moments of my education. This achievement is a testament to their guidance and firm belief in me.

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LIST OF ABBREVIATIONS

AACN	-	American Association of Critical Care Nurses
AP	-	Assistant Practitioner
BACCN	-	British Association of Critical Care Nurses
CCN	-	Critical Care Nurse
CCUs	-	Critical Care Units
ICUs	-	Intensive care units
ICN	-	International conference of Nurses
LMICs	-	Low- and Middle-Income Countries
MoH	-	Ministry of Health
NHRA	-	National Health Research Committee
NMCB	-	Nursing and Midwifery Council of Botswana
PMH	-	Princess Marina Hospital
RN	-	Registered Nurse
SSA	-	Sub-Saharan Africa
UK	-	United Kingdom
UNZABREC	-	University of Zambia biomedical research ethics committee
USA	-	United States of America
WHO	-	World Health Organization
WISN	-	Workload Indicator Staffing Needs

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CHAPTER ONE

1.0 INTRODUCTION AND BACKGROUND

1.1 Introduction

Within the broader context of healthcare delivery, the shortage of nursing staff poses a persistent and multifaceted challenge, particularly within the high-acuity environment of intensive care units (ICU) (Shamsi and Peyravi, 2020; Ahmed et al., 2023; Haddad, Annamaraju and Toney-Butler, 2024). Staff shortages represent a critical concern as they intersect with the intricate demands of providing optimal patient care and maintaining the well-being of healthcare professionals (Ross, 2022; Bagwell et al., 2023). Within the realm of critical care, where patients often require complex interventions and continuous monitoring, the impact of inadequate staffing can be especially pronounced (Nakweenda, Anthonie and Van Der Heever, 2022; Xu, Zeng and Wu, 2023). Consequently, this study seeks to explore the perceptions held by critical care nurses regarding the ramifications of staff shortages within ICUs.

This chapter provides an introduction to the research topic, presenting background information, the research problem, study justification, purpose, research questions, and study objectives. The definition of terms is also outlined. The chapter ends with a conclusion.

1.2 Background

Critical Care Nursing (CCN) involves the specialized care of patients experiencing life-threatening conditions such as trauma, major surgery, and complex medical complications (Milan, Cox & Molebatsi, 2020; Sole, Klein & Moseley, 2020; Kayambankadzanja et al., 2022; Nakweenda, Anthonie & Van Der Heever, 2022). CCN requires not only technical expertise and holistic care but also real-time clinical judgment, responsiveness, and teamwork. Critical care nurses are responsible for continuous patient monitoring, advanced life support, and coordination with interdisciplinary teams, often under physically and emotionally demanding conditions (Kayambankadzanja et al., 2022; Yoon, 2022).

Given the complexity of critical care, appropriate staffing levels are essential for ensuring patient safety, timely interventions, and positive outcomes. The Faculty of Intensive Care Medicine and Intensive Care Society (2022) recommends a nurse-to-patient ratio of 1:1 for level 3 patients and

1:2 for level 2 patients. These guidelines also suggest that at least half of nurses in ICUs should possess post-registration critical care qualifications and highlight the importance of roles such as lead nurses, clinical educators, and supernumerary periods for newly appointed staff (Bray et al., 2010). Similar recommendations are made by the British Association of Critical Care Nurses (BACCN, 2009), while the American Association of Critical Care Nurses (AACN, 2018) emphasizes matching nurses' competencies with patient needs, though it does not define specific ratios.

Despite these standards, staffing remains a global challenge. Studies show that nurse-to-patient ratios and rostering decisions must also consider staff well-being, ICU layout, and team dynamics (Rae et al., 2021; Endacott et al., 2022). However, in many low- and middle-income countries (LMICs), including Botswana, such standards are difficult to meet due to systemic constraints (Imam et al., 2022; Spencer et al., 2023). Factors such as workforce shortages, insufficient training institutions, economic constraints, and limited healthcare infrastructure impede optimal staffing (Atumanya et al., 2020; Nakweenda, Anthonie & Van Der Heever, 2022; Mamalelala, Dithole & Maripe-Perera, 2023).

In sub-Saharan Africa (SSA), ICU staffing challenges are well documented. Studies in Kenya, Nigeria, Uganda, and Ethiopia have shown high nurse-to-bed ratios, often skewed by the small number of ICU beds rather than adequate staffing (Ogunbiyi et al., 2021; Kifle et al., 2022; Mwangi et al., 2023). Botswana faces similar issues. The Nursing and Midwifery Council of Botswana has only 11 registered critical care nurses, underscoring the shortage of specialized personnel (Mamalelala, Dithole & Maripe-Perera, 2023). At Princess Marina Hospital (PMH) in Gaborone, the country's largest public university teaching hospital, the ICU operates with a nurse-to-patient ratio of 1:2 during the day and 1:3 at night, falling short of international standards (Milan, Cox & Molebatsi, 2020; Sharma & Rani, 2020; PMH, 2024).

This shortage stems from multifaceted causes, including increased demand for acute and critical care beds, poor staff retention, limited training capacity, and inadequate healthcare funding (Carter et al., 2020; Rhéaume & Breau, 2022; Pressley & Garside, 2023; Tangcharoensathien & Dhillon, 2023). Attempts to address the shortages, such as employing agency nurses and support staff, have

had limited long-term success (Rae et al., 2021; Endacott et al., 2022; Tamata & Mohammadnezhad, 2023). As a result, critical care settings often experience higher nurse workloads, increased stress, and compromised patient outcomes, including elevated mortality rates (Yoon, 2022; Falk, 2023; Al-Dorzi & Arabi, 2023; Vogt et al., 2023).

Perceptions of these staffing challenges are critical to understanding the broader impact on nurse well-being and care delivery. Perception, shaped by personal and professional experiences, plays a key role in how nurses process and respond to workplace conditions (Zakiah, Dahnilsyah & Masyhur, 2023; Zutaah, Ondigi & Miheso-O'Connor, 2023; Kılıç et al., 2024; Xu, Li & Shan, 2024). ICU nurses often perceive staff shortages as barriers to effective care, reporting increased stress, frustration, and burnout, as well as concerns over patient safety (Dall'Ora et al., 2020; Almenyan, Albuduh & Al-Abbas, 2021; Banda, Simbota & Mula, 2022; Nakweenda, Anthonie & Van Der Heever, 2022; Peng et al., 2023). These negative perceptions can contribute to attrition and deteriorating morale (Xu, Zeng & Wu, 2023).

Understanding critical care nurses' perceptions of staff shortages is essential for informing workforce planning and improving healthcare delivery in resource-limited settings. This study aims to explore those perceptions in the context of Princess Marina Hospital's ICU in Botswana to guide actionable solutions.

1.3 Statement of the problem

Critical care units play a vital role in managing life-threatening conditions, requiring highly skilled and adequately staffed nursing teams. However, a global shortage of critical care nurses has emerged as a persistent challenge, significantly affecting care quality, nurse well-being, and patient outcomes (Vogt et al., 2023; Yoon, 2022). Although guidelines from countries like the UK and USA recommend safe staffing standards, such as a 1:1 nurse-to-patient ratio for Level 3 patients (Faculty of Intensive Care Medicine and Intensive Care Society, 2022; AACN, 2018), these are often unmet in LMICs, including Botswana (Milan, Cox and Molebatsi, 2020; Mamalelala, Dithole and Maripe-Perera, 2023). At PMH, Botswana's largest referral and teaching hospital, ICU staffing ratios remain below recommended levels, and only a limited number of nurses hold formal critical care training.

This staffing deficit compromises the quality and timeliness of care, contributes to increased workload, stress, and burnout among nurses, and may be linked to the high ICU mortality rates recorded at PMH, 54.5% in 2021, 50.1% in 2022, and 40.2% in 2023 (Milan, Cox and Molebatsi, 2020; Sharma and Rani, 2020; PMH, 2024). Perceptions of these shortages by frontline critical care nurses remain underexplored in Botswana, despite their implications for workforce retention, care quality, and health system performance. Therefore, it is imperative to investigate how ICU nurses perceive staffing shortages, how these perceptions influence their work, and what coping strategies they employ to navigate these challenges.

1.4 Study Justification

Staff shortages in Intensive Care Units are a critical issue that compromise patient safety, nurse well-being, and healthcare quality. In Botswana, particularly at Princess Marina Hospital, limited numbers of qualified critical care nurses have coincided with high ICU mortality rates (Milan, Cox and Molebatsi, 2020; Mamalelala, Dithole and Maripe-Perera, 2023). Understanding critical care nurses' perceptions of these shortages offers stakeholders including the Ministry of Health and hospital administrators, key insights into how staffing deficits affect nursing care, job satisfaction, and patient outcomes (WHO, 2020; Rae et al., 2021; Banda, Simbota and Mula, 2022).

This study contributes actionable knowledge for policy development, workforce planning, and resource allocation. It identifies context-specific challenges and coping strategies, and recommends interventions such as targeted recruitment, better working conditions, and staff support systems to improve retention and care quality. It also supports national efforts to meet Sustainable Development Goals 3 and 8 by advocating for improved healthcare delivery and nurse welfare.

While prior studies in Botswana addressed ICU operations and workforce shortages, they did not explore the perceptions of critical care nurses. This study fills that gap, offering a foundation for sustainable staffing solutions in resource-limited settings (Milan, Cox and Molebatsi, 2020; Mamalelala, Dithole and Maripe-Perera, 2023).

1.5 Study Purpose

The purpose of this study is to explore perceptions of critical care nurses on staff shortages in ICUs, Princess Marina Hospital, Gaborone, Botswana so as to guide interventions for enhancing a positive work environment for critical care nurses and the quality of care for patients.

1.6 Research objectives

1.6.1 General Objective

To explore perceptions of critical care nurses towards staff shortages in the intensive care unit at Princess Marina Hospital in Gaborone, Botswana.

1.6.2 Specific Objectives

1. To explore critical care nurses' perceptions of how staff shortages affect the nursing care of patients in the ICU at Princess Marina Hospital, Gaborone, Botswana.

2. To describe the perceived challenges experienced by critical care nurses due to staff shortages in the ICU at Princess Marina Hospital, Gaborone, Botswana.

3. To explore the coping strategies perceived and utilized by critical care nurses in managing staff shortages in the ICU at Princess Marina Hospital, Gaborone, Botswana.

1.7 Research Question

What are the perceptions of critical care nurses towards staff shortages in the intensive care unit at Princess Marina Hospital, Gaborone, Botswana?

1.8 Definition of Terms

Table 2: Conceptual and operational definition of terms

Term	Conceptual definition	Operational definition
Perception	This refers to the way individuals interpret and make sense of sensory information received from their environment (Bhattacharya, 2021; Derman, 2021)	This refers to the views and opinions of the nurses working in the ICU at PMH regarding the adequacy of staffing levels in ICUs and its effect on delivery of patient care.
Intensive care unit / Critical care unit	This is an organized system for the provision of care to critically ill patients that provides intensive and specialized medical and nursing care, an enhanced capacity for monitoring, and multiple modalities of physiologic organ support to sustain life during a period of acute organ system insufficiency (Kifle et al., 2022; Michalsen, Sadovnikoff and Kesecioglu, 2023; Takeuchi et al., 2023)	This is a specialized unit within PMH that provides intensive and continuous health care to patients who are critically ill or at risk of life-threatening conditions.
Critical care nurse	This refers to licensed registered nurses (RNs) with additional specialized on-the-job training and entry-level nursing education. They often hold further qualifications that enable them to provide care to patients with life-threatening conditions (Gautam, 2021; kayambankadzanja, et al., 2022; Tran et al., 2023)	This is the nurse working in the critical care unit at PMH.

Term	Conceptual definition	Operational definition
Staff shortage	This refers to when demand for workers for a particular occupation is greater than the supply of workers who are qualified, available and willing to work under existing market conditions (Winter, Schreyögg and Thiel, 2020).	This is the imbalance between the supply and demand for nurses to deliver health care in the ICU at PMH.
Challenges	The concept of challenges encompasses obstacles or difficulties that arise in various contexts, testing an individual's or organization's ability to adapt, innovate, and achieve their goals (Ignatyeva et al., 2021; Oluyase et al., 2021)	This refers to obstacles or difficulties that arise due to staff shortages in the intensive care unit, testing the nurses' or health facility's ability to adapt, innovate, and achieve their goals.
Coping strategies	This involves the methods and techniques individuals use to manage stress, navigate challenges, and adapt to difficult situations (Maresca et al., 2022)	These are the methods and techniques critical care nurses use to manage stress, navigate challenges, and adapt to difficult situations brought by staff shortages.

1.9 Conclusion

Staff shortages in ICUs pose a persistent challenge, impacting patient care and nurse well-being due to increased workloads and stress (Shamsi and Peyravi, 2020; Ross, 2022; Ahmed et al., 2023; Bagwell et al., 2023; Haddad, Annamaraju and Toney-Butler, 2024). Critical care nurses perceive these shortages as significant obstacles to delivering high-quality care (Dall'Ora et al., 2020; Almenyan, Albuduh and Al-Abbas, 2021; Banda, Simbota and Mula, 2022; Nakweenda, Anthonie and Van Der Heever, 2022; Peng et al., 2023). Recent data on staffing at Princess Marina Hospital's ICU in Gaborone, Botswana, by Milan, Cox and Molebatsi (2020), reflects these challenges, underscoring the need for research to understand nurses' perceptions in order to come up with innovative solutions to the problem. This study aims to explore these perceptions to inform policy, improve staffing, and enhance patient care and nurse well-being, addressing a crucial gap in the healthcare context of Botswana. Understanding these perceptions is vital for optimizing staffing strategies and improving patient outcomes.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter provides an in-depth review of the existing literature on perceptions of critical care nurses on staff shortages in ICUs focusing on the effect of staff shortages on the nursing care of patients, challenges faced by critical care nurses due to staff shortages in the ICU and coping strategies adopted when faced with such challenges. The review is guided by the research questions, aiming at understanding the topic and identifying gaps in the existing literature. Research articles published from 2020 to 2024 in English and relevant to a study on the perceptions of critical care nurses on staff shortages in ICUs were identified by searching on databases such as Google Scholar, PubMed, Science Direct, and Research 4 Life by using Boolean operators and key words and phrases like perception, staff shortage, intensive care unit/critical care unit, critical care nurse, nursing workload, levels of staffing and staffing models.

This chapter provides an overview of the perceptions of critical care nurses on staff shortages in ICUs, followed by the challenges faced by critical care nurses due to staff shortages in the ICU and finally, the coping strategies adopted when faced with such challenges. The introduction and conclusion are also presented at the beginning and end respectively.

2.2 Overview of perceptions of critical care nurses on staff shortages in Intensive Care Untits

Critical care nurses play a vital role in delivering high-quality care to critically ill patients in ICUs (Sole, Klein and Moseley, 2020; Kayambankadzanja, et al., 2022). However, the availability of an adequate nursing workforce is crucial for ensuring optimal patient outcomes and maintaining the safety and well-being of both patients and healthcare providers (Rae et al., 2021; Ross, 2022; Yoon, 2022; Bagwell et al., 2023; Haddad, Annamaraju and Toney-Butler, 2024). Several studies assert that globally, critical care nurses often perceive staff shortages as a factor that increases their workload which then causes negative impacts on quality of care and overall job satisfaction (Rae et al., 2021; Hellín Gil et al., 2022; Ross, 2022; Bagwell et al., 2023; Haddad, Annamaraju and

Toney-Butler, 2024). A study by (Khan, 2021), to explore factors that influence nurses' intention to leave critical care areas found that workforce shortages was one of the factors associated with nurses' intention to leave. The nurses expressed feeling stress and anxiety due to the impact of workforce shortage on training and education, teamwork, workload, and quality of patient's care. The nurses also commented on nursing shortage leading to taking extra shifts because of the shortage of nurses which increases sickness and burnout. These findings are consistent with a study by Vincent et al., (2022) who indicated that shortage of nurses in CCUs is associated with excessive workload, moral distress, and perception of inappropriate care, leading to burnout and increased intent to leave among critical care nurses, which sets up a vicious circle whereby fewer nurses result in increased pressure and stress on those remaining. Bae, (2021) also reported that when nurses perceive insufficient staff size, they reported higher levels of stress at work. Additionally, Bae (2021) reported inconclusive relationships between nurse staffing and nurse outcomes in the ICU setting.

This literature indicates that the perceptions of critical care nurses on staff shortage are related to different negative nurse outcomes which may result in poor quality of care and wellbeing of the critical care nurses. This paves way for researches aimed at maintaining adequate staffing levels in order to reduce nurse outcomes that are related to poor quality of care and nurse wellbeing.

Regional studies also maintain that critical care nurses have expressed concerns about compromised patient safety, increased stress levels, and challenges in providing optimal care due to inadequate staffing levels (Banda, Simbota and Mula, 2022). They argue that, with fewer nurses available to attend to patients, each nurse must care for a larger number of critically ill individuals simultaneously, leading to a heavier workload and reduced time for individual patient care (Nakweenda, Anthonie and Van Der Heever, 2022). This situation can cause stress as nurses may feel overwhelmed by the sheer volume of tasks and patients requiring their attention. Additionally, working under these conditions can lead to frustration as nurses struggle to provide the level of care, they deem necessary, leading to feelings of inadequacy and dissatisfaction. These findings are supported by Banda, Simbota and Mula (2022), who reported that nurses perceive staff shortages as having negative effects on patient care as it compromises the delivery of quality nursing care and has a negative impact on nurses' wellbeing (Ahmed et al., 2023; Alhosani et al.,

2023; Peng et al., 2023; Rani, Sharma and Gupta, 2023). It can then be concluded that indeed critical care nurses have a negative perception towards staff shortages, as it has a negative impact on the provision of critical care services. However, a study conducted in Oman, revealed that nurses' workloads were not correlated with the overall perceptions of patient safety (Al Ma'mari, Sharour and Al Omari, 2020). This might be because both hospitals included in the study comply and maintain optimal staffing models. It can then be noted that maintaining optimal staffing models may reduce negative outcomes perceived by critical care nurses due to staff shortages.

Few studies in the context of critical care nursing have been conducted in Botswana (Milan, Cox and Molebatsi, 2020; Mamalelala, Dithole and Maripe-Perera, 2023) and the studies show that there may be a shortage of critical care nurses or poor compliance with suggested optimal critical care nursing models in Botswana which may also have an impact on their perceptions towards staff shortages leading to negative patient outcomes and low job satisfaction among nurses. This gives a clear indication of the gap in knowledge on the perceptions of critical care nurses on staff shortages in ICUs in Botswana. The findings from the current study can therefore be used to explore the perceptions of the nurses and mitigate the challenge of staff shortage and ensure optimal patient outcomes and maintenance of the safety and well-being of both patients and healthcare providers. The findings from global and regional studies are uniform, also indicating that critical care nurses have a negative perception on staff shortages in ICU due to the challenges presented by staff shortages which influences overall quality of care given to patients and the wellbeing of critical care nurses (Bae, 2021; Banda, Simbota and Mula, 2022; Nakweenda, Anthonie and Van Der Heever, 2022; Vincent et al., 2022; Khan, 2021). The findings from both the studies were used to emphasize the importance of adequate staffing in critical care units and also to suggest innovative ways of improving nurse staffing in CCUs. As such, the current study aims to explore the perceptions of critical care nurses on staff shortages in order to reveal the consequences of staff shortages in CCUs, assess the implementation of innovative solutions to staff shortages and their effectiveness and add other evidence based innovative solutions to staff shortages.

2.3 Perceived impact of staff shortages on the delivery of nursing care to ICU patients

The impact of staff shortages on the quality of nursing care provided to patients has been a significant concern in the healthcare industry. With fewer nurses available, the ability to deliver comprehensive and timely care is compromised, leading to various adverse outcomes. Staff shortages often result in a decline in the quality of patient care. Nurses are required to manage more patients than is optimal, which can lead to rushed or incomplete care. Studies have demonstrated that reduced nurse-to-patient ratios are associated with higher rates of medical errors, patient complications, and mortality (Hegarty et al., 2022; Alhosani et al., 2023; Bae, 2024). The pressure of handling multiple patients simultaneously can lead to an increased risk of medical errors. Critical care environments demand high levels of attention and precision, and staff shortages can compromise these standards. Research indicates that when nurses are overburdened, the likelihood of medication errors, miscommunications, and procedural mistakes rises significantly Rae et al., 2021; Ross, 2022; Yoon, 2022; Bagwell et al., 2023; Haddad, Annamaraju and Toney-Butler, 2024). The inability to provide adequate care can also delay recovery times and increase the likelihood of hospital readmissions. These findings are also supported by regional studies which documented that, with fewer nurses available to attend to patients, each nurse must care for a larger number of critically ill individuals simultaneously, leading to a heavier workload and reduced time for individual patient care (Banda, Simbota and Mula, 2022; Nakweenda, Anthonie and Van Der Heever, 2022)

Patient satisfaction is another aspect adversely affected by nursing staff shortages. When nurses are stretched thin, they have less time to engage with patients, address their concerns, and provide emotional support. This lack of personalized attention can lead to lower patient satisfaction scores and negatively impact the overall patient experience (Beckmann et al., 1998; Almenyan, Albuduh and Al-Abbas, 2021; Hellín Gil et al., 2022; Al-Dorzi and Arabi, 2023).

Globally and regionally, the literature clearly illustrates that staff shortages in ICUs have far-reaching implications for nursing care, affecting everything from workload and burnout to patient outcomes and satisfaction. Addressing these shortages is crucial not only for improving the quality of care but also for safeguarding the health and well-being of nurses. By understanding the multifaceted effects of staff shortages, healthcare policymakers and administrators can develop

targeted interventions to mitigate these challenges and enhance the overall functioning of ICUs. Due to the limited research in Botswana in relation to critical care nursing and staffing, there is a knowledge gap in the context of shortage of critical care nurses and provision of care in the critical care units which paves way for the current research.

2.4 Perceived challenges faced by critical care nurses amid staff shortages in the ICU

The nursing profession, particularly in critical care settings, faces significant challenges due to staff shortages. The shortage of qualified nursing staff has been a persistent issue, exacerbated by factors such as an aging workforce, high turnover rates, and increased demand for healthcare services (Shamsi and Peyravi, 2020; Ahmed et al., 2023; Mamalelala, Dithole and Maripe-Perera, 2023; Haddad, Annamaraju and Toney-Butler, 2024).

One of the primary challenges associated with staff shortages is the increased workload placed on existing nursing staff. Critical care nurses often manage more patients than is optimal, leading to longer shifts and reduced time for breaks (Almenyan, Albuduh and Al-Abbas, 2021; Alhosani et al., 2023; Poudyal, Sharma and Kc, 2023). This heightened workload contributes to physical and emotional stress, which can impact the overall health and well-being of nurses. Regional studies have also shown that chronic stress in nurses is linked to higher rates of burnout, job dissatisfaction, and turnover (Banda, Simbota and Mula, 2022; Rani, Sharma and Gupta, 2023). Staff shortages can also adversely affect patient care. With fewer nurses available, the quality of care may decline due to time constraints and the inability to provide personalized attention to each patient. Research indicates that inadequate nurse staffing levels are associated with higher patient mortality rates, increased incidence of medical errors, and longer hospital stays (Sauro et al., 2020; Banda, Simbota and Mula, 2022; Yoon, 2022; Rani, Sharma and Gupta, 2023). Critical care settings require constant monitoring and immediate intervention, and a lack of sufficient staff can compromise patient outcomes.

Critical care nurses often face ethical dilemmas and moral distress when they are unable to provide the level of care they deem necessary due to staffing constraints(Gautam, 2021; Vincent et al., 2022). This situation can lead to feelings of guilt and helplessness, as nurses struggle to balance their professional responsibilities with the limitations imposed by staff shortages. The literature

highlights that moral distress is a significant factor contributing to nurse burnout and attrition(Wynne et al., 2021). Staff shortages can hinder opportunities for professional development and training. Inadequate staffing often means that nurses are unable to take time off for continuing education or skill enhancement, which is crucial in the ever-evolving field of critical care. This lack of professional growth opportunities can lead to stagnation in career progression and decreased job satisfaction (Pressley and Garside, 2023).

The shortage of critical care nurses presents multifaceted challenges that affect both the nursing workforce and patient care outcomes. Addressing these challenges requires a comprehensive approach that includes policy changes, organizational support, and investments in the nursing profession.

2.5 Coping strategies of critical care nurses to mitigate staff shortages in CCUs

Coping strategies that can be applied by critical care nurses to manage the demands of their jobs and preserve the standard of patient care in the face of staff shortages in ICUs are suggested by different studies. Few studies reveal the coping strategies mentioned by critical care nurses themselves. These coping strategies are crucial for minimizing the negative effects of staffing shortages on nurses' well-being and improving patient outcomes.

Governing bodies around the world have developed staffing standards that enable optimal staffing levels which are meant to mitigate the shortages of critical care nurses (The Faculty of Intensive Care Medicine and Intensive Care Society, 2022; The British Association of Critical Care Nurses (BACCN), 2009; regional guide for determining health workforce staffing norms and standards for health facilities, 2021). However, the shortage of critical care nurses is still ongoing (Spencer et al., 2023; Tamata and Mohammadnezhad, 2023). Organizations from developed countries recruit nurses from other countries, offer scholarships for further education of critical care nurses, cut elective surgeries, increase number of positions in nursing programs, encourage team model of service provision, add overtime to the nurses' shifts, and redeploy nurses (Rae et al., 2021; Endacott et al., 2022; Ross, 2022; Bagwell et al., 2023; Spencer et al., 2023). A study that looked into the coping strategies according to the critical care nurses towards the problem of staff shortage indicated that self-care practices, such as mindfulness, stress management techniques, and seeking

support from peers or supervisors, help critical care nurses maintain their well-being and resilience in the face of staffing challenges (Jun and Costa, 2020).

LMIC also adopt similar coping mechanisms but may differ due to limited resources. The critical care nurses in LMIC prioritize and organize patient care tasks efficiently, focusing on essential interventions and timely assessments to maximize patient safety and highlight the importance of effective management strategies to address staff shortages, such as flexible scheduling, increased support resources, and improved communication channels within the healthcare team (Nakweenda, Anthonie and Van Der Heever, 2022). Time management techniques, such as prioritizing tasks and delegating responsibilities when appropriate, are also commonly employed to optimize workflow and mitigate workload pressure. The critical care nurses may even decide to find better job offers (Xu, Zeng and Wu, 2023) Furthermore, critical care nurses also reported the use of agency nurses and allocation of inexperienced nurses to the CCUs in order to increase the number of available nurses for nursing care (Randa and Phale, 2023). However (Al Ma'mari, Sharour and Al Omari, 2020; Wynne et al., 2021) reported that using agency nurses may not be beneficial since the nurses may lack commitment to the job and also emphasized that inexperienced nurses may lack the necessary knowledge to manage different conditions in the CCU leading to poor patient outcomes. Finally, advocating for adequate staffing levels and resource allocation within healthcare organizations is a proactive strategy employed by critical care nurses to address systemic issues contributing to staff shortages in ICUs.

Studies conducted in Botswana in the context of critical care capacity are scarce and the documented ones indicate that the health care facilities also employ unexperienced nurses and have also added over time to the critical care nurses daily work (Milan, Cox and Molebatsi, 2020; Mamalelala, Dithole and Maripe-Perera, 2023). The literature indicates that mitigating staffing shortages is a complex issue that requires different strategies in the context of a particular facility. The scarcity of studies which focus on the coping mechanisms suggested by critical care nurses, inadequacy of some coping mechanisms and the limited studies on the context of critical care capacity in Botswana regarding workforce dynamics, healthcare infrastructure and resource allocation necessitate the conduction of the current research in order to come up with the most effective strategy to mitigate the problem of staff shortages.

2.7 Conclusion

The literature review highlights the complex interplay between staffing levels, nurse perceptions, and patient outcomes in ICUs underscoring the importance of addressing staff shortages to enhance both patient care and nursing practice in CCUs. The studies demonstrate that critical care nurses perceive staff shortages as a factor that leads to increased workload which may result in negative patient outcomes, and decreased job satisfaction (Bae, 2021; Banda, Simbota and Mula, 2022; Nakweenda, Anthonie and Van Der Heever, 2022; Vincent et al., 2022; Khan, 2021). The causes of staff shortages are similar among different regions with slight differences between the developed and developing countries due to availability of resources. Similarly, the coping strategies are also similar with few differences due to availability of resources. From the literature reviewed it can be noted that few studies have been conducted in Botswana in the context of critical care capacity, most of the coping strategies were developed by the researchers and are also applied by the health facilities but do not reveal the perceptions of critical care nurses about those coping strategies, Therefore, the current study seeks to fill these gaps and produce information that may be used to mitigate issues of staff shortages in local health facilities.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The purpose of this chapter was to present a thorough description of the methodology used to explore perceptions of critical care nurses regarding staff shortages in ICUs. This chapter is essential since it describes the methodical strategy used to guarantee the reliability and validity of the results. This chapter aims to promote transparency and facilitate study replication by providing an in-depth explanation of the research process.

This chapter outlines the study design, setting, population, sample size, sampling technique, inclusion and exclusion criteria, data collection tool and technique, data analysis and presentation of findings. Ethical considerations are also described.

3.2 Study design

A case study design was used to explore the perceptions of critical care nurses regarding staff shortages in the ICU at Princess Marina Hospital. The case in this study is the ICU nurses. This approach is appropriate for this study because it allows for an in-depth and context-specific exploration of the perceptions of the critical care nurses on staff shortages in ICUs, as it captures the unique characteristics of the views and opinions of the nurses. It supports flexible data collection methods such as interviews and observation checklists (Tasci, Wei and Milman, 2020), which this study requires in order to gather rich, narrative data.

3.3 Study setting

Princess Marina Hospital (PMH) is the site where the study was conducted. PMH is in Gaborone, the capital city, and is currently the largest publicly funded referral and university teaching hospital in Botswana with a 24-hour ED, 567 inpatient beds, and the most complete range of specialty services (Milan, Cox and Molebatsi, 2020). The hospital offers various services such as ICU care, in- and out-patient medical and surgical care, obstetrics and gynecology, pediatrics, operating theatre, and several specialized treatments. PMH ICU is an 8-bed ward managed by specialists 24

hours, 7 days a week. These specialists consist of anesthetists and one intensivist with formal ICU postgraduate training, but are only onsite Monday to Friday during normal working hours. PMH ICU nurse-to-patient ratio is 1:2 during day shifts and 1:3 during night shifts. PMH ICU has 24-hour access to radiology (X-rays, ultrasound, and computed tomography (CT) scan) and basic laboratory investigations. Dietitians, physiotherapists, psychologists, occupational therapists, and social workers are available on a referral basis, but no clinical pharmacist is available. (Milan, Cox and Molebatsi, 2020).

PMH was an ideal site for studying critical care nurses' perceptions on staff shortages in ICUs due to its status as the largest publicly funded referral and university teaching hospital in the country, offering comprehensive specialty services. It was therefore expected that the hospital would have all the necessary resources, including staffing, to provide high-level critical care to a wide variety of patients. However, PMH faces a significant challenge in staffing levels, which can have an impact on patient outcomes and staff welfare as a result of the views that they hold. The setting, being in a middle-income country with unique resource constraints, further enhances the study's relevance, offering valuable insights for similar healthcare environments globally.

3.4 Study population

The study population was all the critical care nurses providing direct care to patients in the ICU at PMH, Gaborone, Botswana.

3.4.1 Target Population

The target population was all the critical care nurses working in the ICU at PMH, Gaborone, Botswana.

3.4.2 Accessible Population

The accessible population was all the critical care nurses providing direct care to patients in the ICU at PMH, Gaborone, Botswana and are available at the time of the study.

3.5 Sample size determination

The sample size was determined by datas saturation. Data saturation is the point at which no new themes or codes emerge from data (Mwita, 2022). The method has been used successfully in other studies. Nakweenda, Anthonie and Van Der Heever, (2022), achieved data saturation by the 11th participant when exploring the experiences of critical care nurses regarding staff shortages in critical care units. In this study, data saturation was reached on the 10th participant, which is almost the same to what Nakweenda, Anthonie and Van Der Heever, (2022) achieved in a similar study.

3.6 Sampling technique

Purposive sampling technique was employed to deliberately select participants who have specific knowledge and experience relevant to the research question. During purposive sampling, participants were selected according to the duration they have worked in the ICU; thus, critical care nurses who have worked in the PMH ICU for more than 6 months and provided direct care were selected because they have sufficient exposure. This ensures that the participants can provide focused and pertinent insights into staffing issues (Latheef, 2022).

3.7 Inclusion and exclusion criteria

3.7.1 Inclusion criteria

Critical care nurses who had worked in the PMH ICU for more than 6 months due to sufficient exposure. By including nurses with sufficient levels of experience, this approach captured a diverse range of perspectives, facilitating a well-rounded understanding of the perceptions of the critical care nurses on staff shortages in the critical care unit. The critical care nurses voluntarily expressed their willingness to participate in the study by consenting to ensure adherence to ethical research practices.

3.7.2 Exclusion criteria

The critical care nurses who were not available during data collection due to leave and those who did not consent to participate were excluded from the study.

3.8 Data collection approaches

3.8.1 Data collection tools

Two instruments were used to collect data: an unstructured interview guide and an observational checklist, aligning with the case study design to provide comprehensive and context-rich insights (Mowat, 2022).

The interview guide facilitated face-to-face, in-depth interviews with critical care nurses. It was designed to explore their perceptions of staff shortages and allowed for spontaneous probing based on participant responses. The guide began with a broad, open-ended core question developed by the researcher, with further prompts created during the interviews to delve deeper into the emerging themes.

The observational checklist was used to systematically record non-verbal and behavioral indicators relevant to staff shortages, such as signs of stress, multitasking, skipped breaks, and team interactions. This tool provided contextual evidence to support and complement the interview data. The checklist was refined through expert consultation and pilot testing to ensure clarity, relevance, and effectiveness in capturing the desired data (Naz, 2022).

3.8.2 Data collection techniques

Data were collected through face-to-face interviews and non-intrusive observations. Interviews were conducted with critical care nurses in quiet, private spaces within Princess Marina Hospital ICU, guided by an open-ended question and follow-up prompts. Interviews lasted 45 minutes to 1 hour, were audio-recorded with consent, and participants were debriefed and thanked afterwards. For the observations, the researcher discreetly recorded nurses' behaviors and actions using a structured checklist during designated periods without disrupting normal workflow. Participants were informed through the participant information sheet and again during the consent process that observations would be part of the data collection and that notes would be taken (Dörfler and Stierand, 2021). These observations complemented the interview data by providing real-time contextual insights.

Throughout the study, the researcher used bracketing techniques such as maintaining a reflective journal and audit trail to reduce personal bias. Participants were kept informed of the research progress and were promised a user-friendly summary of the final results (George et al., 2023).

3.9 Trustworthiness

Trustworthiness is a way of ensuring the quality and reliability of the study. The process involves ensuring credibility, transferability, dependability and confirmability (Enworo, 2023; Ahmed, 2024).

To ensure credibility, the study employed triangulation by using data sources from the interview and observation of the behavior and actions relevant to the perceptions of critical care nurses regarding staff shortages in the ICU, such as nurses prioritizing tasks and skipping care tasks that are not regarded as priority after the nurse had explained in the interview that sometimes they skip tasks that are not regarded as priority. Triangulation allowed for cross-verification of data, providing a more comprehensive understanding of the perceptions of the critical care nurses on staff shortages in the ICU. Member checking was also conducted by sharing interview transcripts with participants to confirm the accuracy of the data and interpretations. Member checking ensures that the participants' perspectives are accurately represented. Additionally, prolonged engagement in the ICU setting helped build rapport with participants and gain a deeper understanding of their experiences, further enhancing credibility (Enworo, 2023; Ahmed, 2024).

Transferability was ensured through a thick description, by providing detailed accounts of the research context, including the ICU environment at PMH and the perceptions of critical care nurses. This thick description allows readers to assess the applicability of the findings to other settings. Purposeful sampling was used to select participants with diverse backgrounds ranging from registered nurses working in the ICU without post basic qualification to registered nurses with post basic qualification in critical care and experience that varied from one year to 9 years within the ICU, ensuring a broad range of perspectives were captured. This diversity enhances the potential for transferability of the findings to similar contexts or settings (Enworo, 2023; Ahmed, 2024).

Dependability pertains to the consistency of the findings when applied to similar contexts, settings, and participant groups, yielding comparable results (Kakar et al., 2023). To ensure dependability, the researcher meticulously documented the entire research process, encompassing the study design, data collection techniques and tools, and data analysis methods. This detailed documentation was reviewed and validated by the supervisor and co-supervisor, with necessary adjustments made. This thorough verification ensures that the research methodology is robust and acceptable.

To ensure confirmability, the researcher engaged in reflexive practices, such as keeping a reflexive journal to critically reflect on personal biases, assumptions, and their potential influence on the research process. Data triangulation was used to cross-verify findings from interviews and observations of the nurses' behavior and actions relevant to their perceptions on staff shortages, reinforcing the objectivity of the data. The detailed documentation of the research process and decisions made during the study provides an audit trail that can be reviewed by others to confirm the findings. These practices help ensure that the study's results are based on the data rather than the researcher's preconceptions (Kakar et al., 2023).

3.10 Data management, processing and storage

Data management begun during the data collection process, where interviews with participants were recorded using an audiotape. This facilitated the collection of proper data to maintain the authenticity of participants' responses. While NVivo, a qualitative data analysis software, was used to facilitate the coding and organization of data, it is acknowledged that NVivo may have limitations in transcription. Therefore, transcriptions were conducted manually five to ten hours after each interview to capture all details accurately before importing into NVivo for analysis. Manual transcription was chosen for its robustness in handling qualitative data and its ability to provide a detailed and nuanced understanding of the participants' perspectives. The use of software aids in managing large volumes of data systematically and ensures a rigorous and transparent analysis process (Mezmir, 2020; Muzari, Shava and Shonhiwa, 2022). Triangulation of data from interviews and observations was conducted at this stage. The transcriptions were anonymized to protect participants' identities, with unique codes replacing personal identifiers. The transcribed data was then reviewed and cleaned to correct any errors or inconsistencies. This meticulous

processing was chosen to ensure that the data is accurate and ready for thorough analysis, maintaining the integrity of the research findings (Muzari, Shava and Shonhiwa, 2022). The verbatim transcription was conducted to create textual data. Digital files were stored on an encrypted, password-protected computer, while the papers for transcribed data were kept in a locked cabinet. This storing approach was chosen to protect the confidentiality of participants and comply with ethical standards, ensuring that only authorized personnel have access to the sensitive data (Muzari, Shava and Shonhiwa, 2022).

3.11 Data analysis

Data analysis involved coding the transcribed interviews and the recorded observations and identifying emerging themes related to the research question. Thematic analysis was employed, which involves systematically reviewing the data to identify patterns and themes that provide insights into the perceptions of critical care nurses on staff shortages. The following six steps process of the thematic data analysis by Braun and Clarke (2006) were adapted in this study as follows:

Step 1: familiarization with the data

This involved transcription of the verbatim (verbal data) and also reading and re-reading of both the transcripts and the documented observations. The verbatim was transcribed manually by the researcher and later translated from Setswana to English. It was important to translate the interviews as they were transcribed to ensure an understanding of the information given by the participants first. This was also helpful in the process of coding and developing themes for the study.

To ensure that the researcher becomes acquainted with the data for the purpose of the analysis and interpretation, the original interview of the completed verbatim transcription was listened to several times to ensure familiarization with the data before going any further into the analysis process. Notes were made and some expressions written down.

Step 2: Generating initial codes

The data was then divided into meaning units that were summarized. The summarized meaning units were abstracted and labelled with codes. The data was then read through again in order to

identify data that relate to each other or linking codes. The codes were listed and different categories of codes were identified. The codes were then sorted into potential themes and ensuring that the codes were put together according to the research objectives as shown in table 3.

Step 3: Search for themes

Themes were developed by interpreting categories of coded data for their underlying meaning. The researcher combined some codes into similar ideas that depict or closely depict the data; thereby preliminary themes and sub-themes were generated.

Step 4: Review themes

From the preliminary themes that were identified in step 3 during the search, some major themes were identified. The themes were reviewed if they were making sense.

Step 5: Define themes

From reviewing themes, four major themes were identified and named which also have other subthemes which were used in the final analysis of the contents.

Step 6: Writing up

By using the identified thematic relationships and patterns identified during the interpretation process, the researcher generated the perceptions of critical care nurses on staff shortages in the ICU as they provide care to the patients.

3.12 Ethical considerations

The study adhered to ethical research standards by seeking permission to conduct the research, obtaining informed consent from all participants, ensuring confidentiality and anonymity. These measures were in place to ensure that the study is conducted ethically and responsibly, respecting the rights and welfare of all participants. Permission to conduct the research was obtained from the National Health Research Authority (NHRA) (Reference No.: NHRAR-R-1768/17/07/2024) in Zambia. Ethical approval was sought from the University of Zambia Research Ethics Committee (UNZABREC) (Reference No.: 5740- 2024), the Botswana Ministry of Health Human Research

and Development Committee (HRDC) (Reference No HPRD: 6/14/1), and the PMH Research and Ethics Committee (Reference No: PMH 2/11AII (598)) before data collection begun.

Informed consent facilitates shared decision-making between the participant and the researcher. Therefore, participants were informed about the study's purpose, that an audio recorder will document the interview sessions, and that field notes will be taken. Additionally, each participant received a study information letter. To ensure participants understood the study's goal, they were given ample time to read the information letter. The researcher then obtained informed consent from the participants before conducting any interviews and making field notes.

Confidentiality was maintained through several measures. All participants' identities were protected by assigning unique codes to their data, ensuring that their names and other identifying information are not linked to the study findings. Audio recordings and written notes were securely stored in locked cabinets and password-protected digital files, accessible only to the researcher. During data analysis and reporting, any potentially identifying details were removed or anonymized. Additionally, participants were reminded of their right to withdraw from the study at any time without consequence, further ensuring their comfort and privacy.

Beneficence was ensured by prioritizing the well-being and interests of the participants throughout the study. This involved conducting the research in a manner that minimized any potential risks or discomforts such as conducting the interviews in quiet isolated rooms. The researcher created a supportive and non-judgmental environment during data collection by establishing rapport, actively listening, and ensuring confidentiality to encourage honest and open communication. Participants were informed about the purpose and benefits of the study, emphasizing how their contributions can help improve ICU staffing and patient care. The overall goal is to ensure that the study's outcomes provide valuable insights that can lead to positive changes in healthcare practices and policies

CHAPTER FOUR

4.0 FINDINGS

4.1 Introduction

This chapter focuses on the presentation of the study's findings, providing a detailed account of the data collected from interviews and observations with critical care nurses at Princess Marina Hospital. The chapter aims to bring forth the voices of these nurses, highlighting their perceptions of staff shortages in the ICU and the subsequent impact on patient care and their well-being. Through a thematic analysis, key themes and subthemes emerged, illustrating the complex and multifaceted nature of the issue. This chapter offers a rich, descriptive narrative of these findings, supported by direct observations and participant accounts, to provide a comprehensive understanding of the challenges posed by staffing shortages in critical care settings.

4.2 Presentation of findings

The presentation of findings focuses on providing a rich, descriptive narrative that brings participants' voices on their perceptions on staff shortages in the ICU to the forefront. The findings are organized around the key themes and patterns that emerged during data analysis, ensuring that each theme addresses the study objectives. Each theme is introduced with a brief explanation, followed by an in-depth exploration supported by direct quotes from participants. These quotes serve to illustrate and validate the interpretation, allowing readers to understand the context and meaning behind the data. They provide authentic examples of the viewpoints being discussed.

To enhance clarity, the themes have been organized hierarchically, with main themes and sub-themes. For example, this study presents "Compromised quality of patient care" as a main theme and include sub-themes such as "delayed responses to patient needs" and "reduced monitoring of patients". This structure helps in presenting findings systematically, ensuring that readers can easily follow the narrative. Codes that identify the meaningful units of data where the main themes have been derived from have also been presented.

4.2.1 Socio-demographic characteristics of participants

Interviews were conducted with 10 participants upon which data saturation was reached. Data saturation was determined when no new information, themes, or insights emerged from the

interviews, and the data began to show redundancy. This was achieved after interviewing 10 participants, as their responses consistently reflected similar patterns regarding staff shortages in the ICU. Two male nurses participated in the study. Nurses had a working experience ranging from 1 to 9 years of working in the ICU and a range of 3 to 24 years of experience working as a nurse. The majority of the participants had a diploma in nursing and midwifery, and a few had a bachelor's degree in nursing and midwifery. Few participants also had post-basic training or qualifications in critical care nursing.

4.2.2 Themes and sub-themes

This section integrates findings from both data collection methods, illustrating how interviews provided in-depth understanding of the nurses' perceptions, while observations corroborated these perceptions with real-world behavior and environmental context as appropriate. Thus, both convergent and divergent findings are presented. Four themes emerged from the thematic analysis and include compromised quality of patient care, physical and psychological impact on the nurse, Ineffective coping mechanisms and role of adequate staffing in patient care. The summary of the themes, sub-themes and codes are presented in table 3 below, which is followed by their description.

Table 3: Themes, sub-themes and codes

Themes	Sub-themes	Codes from interviews	Codes from observations
Compromised quality of patient care	1. Delayed responses to patient needs	a. Delays in attending to non-critical patients due to prioritization of emergencies b. Missed minor care interventions	a. Long waiting times for non-emergency procedures b. Postponement of routine procedures
	2. Reduced monitoring of patients	a. Reduced frequency of routine checks due to high workload b. Inability to provide individualized care	a. Fewer routine rounds on stable patients b. Lack of personalized attention during patient interactions
	3. Increased risk of errors	a. Overlooked patient symptoms leading to delayed interventions	a. Incorrect documentation or omissions in patient records b. Noted errors or near-misses in patient documentation or care
		b. Miscommunication during handovers resulting in incomplete patient information c. Fatigue impacting cognitive function, increasing error rates	Visible signs of fatigue affecting concentration and accuracy

Physical and psychological impact on the nurse	1. Increased workload and physical fatigue	a. Complaints of exhaustion after shifts b. Long shifts without adequate rest periods c. Difficulty in maintaining physical stamina over consecutive shifts	a. Visible fatigue, slower response times during later hours b. Nurses seen taking short rest breaks, showing signs of fatigue c. Nurses seen with slouched posture, slower movements as shifts progress
	2. Psychological stress	a. Anxiety about potential errors due to high workload b. Feelings of being overwhelmed by workload c. Burnout symptoms, including emotional exhaustion and decreased motivation d. Limited engagement with support systems due to time constraints	a. Frequent expressions of stress, fidgeting, or sighing b. Lack of participation in available support or counseling services
	3. Reduced job satisfaction	a. Dissatisfaction with inability to provide optimal care b. Feelings of unappreciation and low morale c. Contemplating leaving the profession due to stress	a. Nurses expressing frustration or disappointment during interactions b. Reduced enthusiasm and engagement during tasks

		d. Decreased job motivation and fulfillment	c. Observed discussions among nurses about career dissatisfaction
Ineffective coping strategies	1. Over-reliance on overtime	a. Taking on additional shifts to cover staff shortage b. Dependence on additional hours to meet patient care demands	a. Nurses frequently working beyond their scheduled hours b. Extended working hours resulting in visible fatigue
	2. Minimal use of support systems	a. Hesitation to seek psychological support or counseling b. Stigma associated with seeking mental health support Preference for self-reliance in managing stress	a. Rare discussions about mental health support among staff b. Lack of engagement in wellness programmes

	3. Abuse of sick leaves	a. Increased frequency of sick leave usage to cope with stress b. Acknowledgement of using sick leave for rest rather than actual illness c. Strain on remaining staff due to frequent sick leave among colleagues	Sudden and frequent sick leave applications among staff
Role of adequate staffing in patient care	1. Improved patient outcomes	a. Perception that adequate staffing leads to better patient recovery due to timely and comprehensive care b. Enhanced patient satisfaction with	a. More timely and efficient patient care with minimal delays b. Detailed attention to patient needs and documentation

		adequate nurse attention c. Reduction in complications when staffing is sufficient d. More thorough monitoring and personalized care	c. Increased nurse-patient interactions, fostering positive feedback d. Decreased frequency of care-related issues or emergencies
	2. Enhanced nurse well-being	a. Reduced workload and improved job satisfaction b. Increased focus and confidence during shifts c. Better team dynamics and communication with adequate staffing d. Greater sense of accomplishment and fulfillment	a. Fewer signs of stress and burnout in adequately staffed shifts b. More relaxed and engaged nursing staff c. Clear and efficient task management d. Observed collaborative efforts and positive team interactions Nurses demonstrating pride and satisfaction in their work

Participants had varied perceptions on staff shortages in ICU at Princess Marina hospital in Gaborone. All of the themes are interconnected, and from the analysis, it emerged that staff shortages in the ICU significantly impact patient care, nurse well-being, and overall operational efficiency. A detailed description of the identified themes and sub-themes is presented below.

Theme 1: Compromised quality of patient care

Participants shared insights into how staff shortages in the ICU influenced their ability to provide quality patient care. They consistently highlighted that staff shortages adversely affected the quality of patient care. Delays in providing critical interventions, reduced frequency of patient monitoring, and an inability to meet individualized patient needs were recurring issues. The analysis revealed three subthemes namely, delayed responses to patient needs, reduced patient monitoring and increased risk to errors.

Subtheme 1: Delayed responses to patient needs

The subtheme delayed responses to patient needs emerged prominently from both interviews and observations, revealing the challenges critical care nurses face in providing timely care in the context of staff shortages at Princess Marina Hospital's ICU. Many participants highlighted that staff shortages often resulted in delayed responses to patients' needs, particularly during emergencies. Some of the perceptions were:

> *"Sometimes, I have to prioritize critical cases, and as a result, other patients wait longer than they should. It's heartbreaking because every patient deserves immediate attention" (participant no. 8)*

> *"We're stretched so thin that sometimes it feels impossible to give each patient the attention they need. I worry that important details might get missed, and that puts their safety at risk" (participant no. 3)*

This delay was seen as a compromise on the standard of care, leading to increased stress among ICU. Other participants added:

> *"Even when we know a patient needs immediate care, we're sometimes forced to delay because we simply don't have enough hands. It's a terrible feeling to know you're not meeting the standards you were trained for" (Participant No. 6).*

These sentiments from interviews were corroborated by documented instances of alarms being unattended due to competing priorities. Observations revealed instances where patient monitors alerted staff to critical changes, but nurses were delayed in responding due to attending to other patients. This is exemplified by:

> Observation note 2: "At 2:15 PM, an alarm for low oxygen saturation on patient C's monitor was not addressed until 2:22 PM because the nurse was busy repositioning patient A."

Observations revealed that staff shortages in the ICU at Princess Marina Hospital led to frequent delays in providing routine care, such as hygiene assistance, medication administration, and other basic needs. These delays were observed to have significant consequences for patient comfort, recovery, and overall satisfaction with care. Evidence of these observations include:

> Observation note 5: "At 2:00 PM, a patient's medication was scheduled but was delayed until 2:45 PM due to attending to an emergency elsewhere."

All these observations involve a notable occurrence where a nurse would apologize to a patient for the delay in attending to their request, indicating an acknowledgment of the issue.

Subtheme 2: Reduced Patient Monitoring

Reduced patient monitoring also emerged as a prominent issue from both interviews and observations, as participants revealed the impact of staff shortages in the ICU. Participants noted that the reduced frequency of patient monitoring was a significant concern, especially that an ICU is a setting where close and continuous observation is critical for timely interventions. Many expressed the difficulty in maintaining constant vigilance over their patients due to the lack of sufficient staff. Participants also expressed that the situation not only compromised patient safety

but also placed additional emotional and professional stress on the nursing staff, who felt unable to fulfill their responsibilities to the best of their abilities. One participant stated:

> *"I constantly feel like I'm failing my patients because I can't give them the care they deserve. It's emotionally draining, knowing that despite our best efforts, we're stretched too thin to meet everyone's needs" (Participant No. 3).*

This highlighted the relationship between this theme and theme two on physical and psychological impact. Findings from this sub-theme are illustrated by the following responses:

> *"It's impossible to monitor patients as closely as we should when we're short-staffed. We do our best, but things can slip through the cracks" (Participant No. 4).*

> *"Sometimes, by the time we catch a change in a patient's condition, it's later than we would have liked. It's not because we're negligent, but because we can't be everywhere at once" (Participant No. 9).*

Observations confirmed this issue, with several instances where patient monitoring was visibly reduced. It was frequently noted that nurses were occupied with attending to critical emergencies or performing other essential tasks, resulting in prolonged gaps between routine checks for non-critical patients. Patient monitors often displayed unattended alarms for extended periods, and in some cases, visible signs of patient discomfort or distress went unaddressed due to competing demands on the nursing staff. These observational findings corroborated the participants' accounts, highlighting the systemic nature of the problem and its impact on the overall quality of care. This was demonstrated by observations of:

> *Observation Note 4: During peak workload periods, a nurse was observed prioritizing emergency care over scheduled rounds, leading to missed opportunities for early intervention.*

Subtheme 3: Increased risk of errors

The increased workload and stress due to staff shortages also contributed to a higher risk of errors, as expressed by participants during interviews and the situation was also observed. Many nurses reported that, under such pressure, they were forced to rush through tasks or multitask in ways that

compromised their attention to detail. Nurses spoke candidly about their fear of making mistakes, which further heightened their emotional strain and fatigue. These findings are exemplified by the following responses:

> *"When you're rushing between patients, the chances of making a mistake increase. It's scary because even a small error can have serious consequences in the ICU" (Participant No. 1).*

> *"I've seen colleagues double-checking less often because they're overwhelmed, and that's when mistakes happen" (Participant No. 2).*

Observations also supported responses from participants, as instances of rushed and incomplete care were documented. In several cases, nurses were observed administering medications without double-checking dosages or patient records, probably due to time constraints. Some of observations made in this aspect include:

> *Observation note 7: "During a shift handover at 07:30 AM, a nurse was observed hurriedly updating patient records, resulting in missing details about a medication change. This omission led to confusion for the incoming nurse, who had to seek clarification from the outgoing staff before administering the next dose."*

Theme one which is compromised quality of patient care emerged as a significant issue arising from staff shortages in the ICU at Princess Marina Hospital. Both interviews and observations provided a comprehensive understanding of how limited staffing negatively impacted the ability of critical care nurses to deliver timely, thorough, and compassionate care. The findings highlighted that delays in patient responses, reduced monitoring, and increased errors were direct consequences of being overwhelmed by an unmanageable workload. Nurses expressed feelings of guilt, stress, and helplessness as they struggled to meet the needs of their patients under these challenging conditions. Observational data further reinforced the interviews, providing tangible evidence of missed alarms, prolonged waits for routine care, and critical oversights in patient monitoring. These issues contributed not only to a diminished patient experience but also to worsened health outcomes, as delayed interventions and inadequate care had the potential to escalate patient conditions.

Theme 2: Physical and psychological impact on the nurse

Participants frequently discussed the physical and psychological toll that staff shortages had on them. The constant pressure to manage a high workload with insufficient staffing led to both physical exhaustion and psychological stress, impacting their overall well-being and job performance. This theme is closely linked to compromised quality of patient care, as the well-being of nurses directly influences their ability to perform their duties effectively. The analysis revealed three subthemes: physical fatigue, psychological stress, and reduced job satisfaction.

Subtheme 1: Increased workload and physical fatigue

The subtheme increased workload and physical fatigue elucidated the perceived challenges faced by critical care nurses amid staff shortages while providing nursing care in the ICU. Both interviews and observations highlighted that the excessive workload due to staff shortages led to significant physical fatigue among nurses. Participants frequently described feeling physically drained, with one saying,

> *"By the end of my shift, I feel completely exhausted, both physically and mentally. It's a struggle to keep up with the pace when we're short-staffed" (Participant No. 5).*

Another noted:

> *"I often skip breaks just to keep up with the workload. By the time I get home, I'm too tired to do anything but sleep" (Participant No. 6).*

Observations mirrored these sentiments:

> *Observation note 8: During a shift, a nurse was often seen working through breaks and showing visible signs of exhaustion, such as slower response times and slouched posture.*

This observation corroborated the interview data, underscoring the physical demands placed on the staff.

Subtheme 2: Psychological stress

The psychological impact of working in a high-pressure, understaffed environment was also a recurring theme from the interviews. While interviews revealed deep emotional exhaustion and burnout, these were less observable. However, indirect signs such as rushed interactions and decreased patient engagement were noted. Participants shared feelings of stress, anxiety, and burnout:

> *"I've had moments where I felt on the verge of a breakdown. The emotional strain is immense, especially when you're dealing with critical cases and there's not enough support" (Participant No. 3).*

Subtheme 3: Reduced job satisfaction

The subtheme of reduced job satisfaction emerged as a significant aspect of the perceived impact of staff shortages in the ICU. Both interviews and observations indicated reduced job satisfaction among nurses, with participants expressing dissatisfaction with their inability to provide optimal care, which was supported by observed signs of disengagement. Participants voiced their frustration over the disconnect between their professional aspirations and the realities of their work environment, which often left them feeling unfulfilled.

> *"I entered this profession to make a difference, but it's hard to feel satisfied when you're constantly stretched thin and can't give your best" (Participant No. 6)*

Observations supported this:

> *Observation note 9: At the end of the shift, a nurse was observed taking a prolonged moment at their station, staring blankly at the screen. When asked by another staff member if they were okay, the nurse replied, "I'm just counting down the days until my next day off. This job doesn't feel fulfilling anymore."*

The theme of physical and psychological impact on the nurse highlighted the dual burden of physical exhaustion and emotional stress caused by staff shortages. Interviews and observations together painted a comprehensive picture of how these factors interplayed to diminish both the well-being and job satisfaction of ICU nurses. The convergence of findings emphasized the critical need for addressing staffing issues to alleviate the physical and psychological strain on nurses, ultimately improving patient care outcomes.

Theme 3: Ineffective coping strategies

The theme of ineffective coping strategies explored how the critical care nurses at Princess Marina Hospital managed the stress and demands of their work environment. Participants identified several maladaptive strategies they relied upon, including over-reliance on overtime, minimal use of support systems and abuse of sick leave. These coping strategies, while providing temporary relief, often contributed to further stress and organizational challenges.

Subtheme 1: Over-reliance on overtime

Both interviews and observations highlighted the frequent use of overtime as a coping mechanism. Nurses' reliance on extra hours was consistently noted, with visible signs of fatigue corroborating their accounts. Participants explained how the persistent need for overtime was both a symptom and a cause of ongoing stress, as it left them with little time for rest and recovery

> *"Working overtime has become the norm, but it's not sustainable. I'm always tired and feel like I'm running on empty" (Participant No. 6).*

Observational data reflected this:

> *Observation note 10: The nurse who was noted extending a morning shift showed signs of fatigue during patient assessments in the evening shift.*

Subtheme 2: Minimal use of support systems

The subtheme minimal use of support systems highlights how some nurses fail to fully utilize available support resources, such as counseling services, peer support groups, and stress management programs. This underutilization may stem from a lack of awareness, perceived stigma, or a culture that discourages seeking help. Both interviews and observations revealed that while support systems exist, they are not frequently used by the nurses, leading to increased feelings of isolation and burnout.

From the interviews:

> *"I know there are counseling services available, but I rarely have the time or energy to use them. It feels like just one more thing on my to-do list" (Participant No. 5).*

> *"There's a fear of being seen as weak if you seek help. So, most of us just keep pushing through, even when we're struggling" (Participant No. 7).*

Observations revealed a lack of engagement with available support:

> *Observation note 11: Nurses rarely discussed or sought out mental health resources during shifts.*
>
> *Observation note 12: There were no visible signs of structured debriefing sessions or peer support in response to stressful events.*

Subtheme 3: Abuse of sick leaves

While interviews revealed the strategic use of sick leave to cope with stress, this behavior was not directly observable. However, patterns of sudden and frequent sick leave applications among staff suggested a reliance on this coping mechanism. Participants admitted to occasionally using sick leave not for actual illness but as a means to recuperate from the overwhelming demands of their work.

> *This is supported by the response: "Sometimes, taking a sick day is the only way to get some rest. It's not ideal, but it's necessary" (Participant No. 1)*

The theme of ineffective coping strategies shed light on the maladaptive strategies employed by ICU nurses to manage their workload and stress. The convergence of interview and observational data on overtime reliance highlighted a cycle of overwork and fatigue. Divergence in the findings related to sick leave usage pointed to the hidden nature of this coping mechanism, which, although not directly observable, had significant implications for team dynamics and patient care.

Theme 4: Role of adequate staffing in patient care

Participants underscored the critical role that adequate staffing plays in ensuring the delivery of high-quality patient care in the ICU. The narratives revealed that sufficient staffing levels not only enhanced patient outcomes but also improved the overall workflow and morale among nurses. This theme interconnects with others, such as compromised quality of patient care and physical and psychological impact on the nurse, highlighting the holistic impact of staffing on various aspects of ICU operations. Two subthemes were identified: improved patient outcomes and enhanced nurse well-being.

Subtheme 1: Improved Patient Outcomes

Adequate staffing was consistently linked to better patient outcomes. Participants noted that when the ICU was properly staffed, nurses could attend to patients promptly, administer medications on time, and monitor patients closely. This proactive care approach significantly reduced the risk of complications and improved recovery rates.

The following responses were noted from the interviews:

> *"When we have enough staff, we can give each patient the attention they deserve, which makes a huge difference in their recovery" (Participant No. 9).*

> *"Patients receive more timely care, and we can monitor them more closely, which helps in catching complications early" (Participant No. 8).*

Observations supported these insights:

> *Observation note 12: A nurse who had a nurse-to-patient ratio of 1:1 in the morning shift showed more timely responses to patient needs and fewer delays in routine care.*

> *Observation note 13: A nurse who had a nurse-to-patient ratio of 1:1 in the morning shift was observed to be able to spend more time with the patient, resulting in more thorough care and patient satisfaction.*

Subtheme 2: Enhanced Nurse Well-Being

Participants also highlighted the positive impact of adequate staffing on their own physical and psychological well-being. With sufficient staffing, nurses reported lower levels of stress, reduced fatigue, and a greater ability to provide empathetic care.

> *"On days when we have a full team, I feel less rushed and more capable of giving my patients the attention they deserve. It also helps me leave work feeling less drained" (participant no. 8)*

Observations during adequately staffed shifts showed:

> *Observation note 14: In the morning shift when most nurses had a nurse-to-patient ratio of 1:1 with additional staff as nursing students, nurses were observed taking their scheduled breaks, engaging in supportive communication, and displaying a more positive demeanor."*

The linkage between adequate staffing and nurse well-being underscores the bidirectional relationship between the care environment and staff health. Enhanced well-being not only improves job satisfaction but also translates into more attentive and compassionate patient care.

4.3 Conclusion

This chapter presented the findings of the study, shedding light on the multifaceted impact of staff shortages in the ICU at Princess Marina Hospital. The themes identified including compromised quality of patient care, physical and psychological impact on nurses, ineffective coping strategies,

and the critical role of adequate staffing paint a comprehensive picture of the challenges faced by critical care nurses. The findings underscore the interconnected nature of these themes, highlighting how staffing deficits not only compromise patient care but also take a significant toll on nurses' physical and mental well-being. Moreover, the data revealed the ineffectiveness of current coping strategies and the transformative potential of adequate staffing in improving both patient outcomes and nurse satisfaction. This chapter laid the groundwork for the subsequent discussion and recommendations, aiming to address the highlighted issues and improve the overall functioning of ICU settings.

CHAPTER FIVE

5.0 DISCUSSION OF FINDINGS

5.1 Introduction

This chapter presents a comprehensive discussion of the findings from the study on the perceptions of critical care nurses regarding staff shortages in the ICU at Princess Marina Hospital, Gaborone, Botswana. The discussion integrates professional knowledge, findings from this study, and relevant literature to provide a comprehensive understanding of the issues surrounding staff shortages in the ICU at Princess Marina Hospital. Each theme is discussed in detail, highlighting similarities and discrepancies with existing research, and considering the limitations, delimitations, and assumptions of this study. The chapter begins with a discussion of socio-demographic characteristics of the participants followed by the discussion of the themes. Implications of the study findings in relation to the nursing practice, education, administration and research as well as recommendations, how the findings will be disseminated and utilized and, strengths and limitations of the study have also been discussed.

5.2 Socio-demographic characteristics of participants

In-depth interviews were conducted with 10 participants, achieving data saturation. Among the participants, two were male nurses. The participants' ICU experience ranged from 1 to 9 years, while their overall nursing experience varied from 3 to 24 years. Most participants held a diploma in nursing and midwifery, while a few had a bachelor’s degree. Some participants had post-basic training in critical care nursing. These varied socio-demographic characteristics provided a rich context for understanding the perspectives of the nurses.

The low number of nurses with post-basic training in critical care suggests that, like other hospitals in LMICs, PMH ICU employs many nurses without specialized training, possibly due to limited training institutions. This is consistent with studies documenting the employment of untrained ICU nurses in LMICs due to shortages (Milan, Cox & Molebatsi, 2020; Mamalelala, Dithole & Maripe-Perera, 2023). This finding contrasts with the guidelines of The Faculty of Intensive Care Medicine and Intensive Care Society (2022), which advocate for supernumerary practice periods and that at least 50% of ICU nurses have post-registration academic programs in CCN. Employing nurses

without critical care training may lead to poor patient management, nurse dissatisfaction, and increased adverse outcomes.

However, in this study, nurses' perceptions of staff shortages were consistent regardless of qualification. Both trained and untrained nurses noted increased workload, compromised care quality, and task prioritization. This contrasts with Iwanowicz-Palus et al. (2022), who found that education level influenced coping strategies, with more educated nurses using more effective strategies.

Regarding gender, both male and female nurses expressed similar views on staff shortages, including using sick leave to cope. This contrasts with Nakweenda, Anthonie & Van Der Heever (2022), who noted gendered perceptions, with ICU nursing perceived as requiring physical strength, thus favoring male staffing for certain tasks.

Overall, these characteristics help to contextualize the nurses' perceptions, highlighting that staff shortages pose challenges irrespective of gender or qualification.

5.3 Compromised Quality of Patient Care

Staff shortages significantly impacted patient safety and quality of care. According to WHO (2014), quality care should be timely and effective. This study found that care was delayed, monitoring was reduced, and errors increased. These findings support the objective on assessing the effect of staff shortages on ICU nursing care. Staff shortages increased nurses' workload, causing them to prioritize tasks and omit essential interventions like patient repositioning. Studies by Rae et al. (2021) and Ross (2022) support these findings, linking insufficient nurse staffing to adverse outcomes, including higher mortality and medical errors.

Naseem, Naseem, and Amir (2024) argue that staff shortages lead to inefficiencies and financial burdens due to extended hospital stays and errors. WHO (2024) emphasizes timely, effective care, which this study shows was lacking. Solutions include policy changes, better staffing ratios, investment in training, and use of supportive technologies.

Nurses also experienced emotional distress due to their inability to provide quality care. This aligns with Peng et al. (2023), who linked staff shortages to nurse burnout and turnover. Similar findings by Nantsupawat et al. (2022) and Lasater et al. (2021) reinforce that better staffing improves outcomes and reduces complications. Addressing staff shortages is essential for breaking this cycle and improving both patient and nurse outcomes.

5.4 Physical and psychological turmoil on critical care nurses due to staff shortages

Nurses experienced significant physical and psychological stress due to staff shortages. The workload led to fatigue, stress, and low job satisfaction, supporting the objective examining ICU nurses' challenges at PMH. According to WHO (2020), such conditions cause musculoskeletal strain, while Babapour, Gahassab-Mozaffari & Fathnezhad-Kazemi (2022) cite stress and burnout. Nurses felt guilt and moral distress when unable to deliver optimal care (Rosa et al., 2020). Bae (2021) also identifies workload as a key burnout factor.

Burnout, characterized by exhaustion and reduced accomplishment, affects care quality and retention (Jun et al., 2021; Kelly, Gee & Butler, 2021). These findings are consistent globally, though severity varies by healthcare system capacity (Dall'Ora et al., 2020; Haddad, Annamaraju & Toney-Butler, 2024). Under-resourced systems face more severe impacts (Tamata & Mohammadnezhad, 2023).

Studies by Almenyan, Albuduh & Al-Abbas (2021), Khan (2021), and Banda, Simbota & Mula (2022) show job dissatisfaction from excessive workload. This study adds qualitative insights, highlighting emotional impacts like helplessness and guilt, often missed in quantitative research.

These findings affirm Objective No. 2, revealing that staff shortages cause physical and emotional strain, compromising nurse well-being and care quality.

5.5 Ineffective coping strategies among ICU nurses due to staff shortages

The study identified several ineffective coping mechanisms, such as abuse of sick leave, over-reliance on overtime, and minimal use of support systems. These responses reflect maladaptive

reactions to chronic stress. Dall'Ora et al. (2020) report similar findings on maladaptive coping due to high workload.

Overtime exacerbates fatigue and reduces productivity, consistent with findings by Bae (2024) and Hernandez et al. (2024). Nurses working extra hours experience ongoing stress, affecting attentiveness and care quality. Limited use of support systems was noted, differing from developed countries where such systems are robust and utilized (Rae et al., 2021; Endacott et al., 2022; Bagwell et al., 2023). Cultural norms may discourage help-seeking behaviors.

Sick leave abuse was a coping mechanism, but it worsened shortages. This aligns with Dall'Ora et al. (2020), who link burnout to absenteeism. Cultural and institutional factors may influence such behavior. Effective coping strategies and support systems are needed to mitigate physical and psychological impacts.

5.6 Role of adequate staffing in patient care

Adequate staffing enhances patient outcomes and nurse well-being. This supports recommendations from The Faculty of Intensive Care Medicine & Intensive Care Society (2022) and is echoed by Rae et al. (2021), Ross (2022), Yoon (2022), Bagwell et al. (2023), and Haddad, Annamaraju & Toney-Butler (2024). Adequate staffing allows nurses to deliver focused care, reducing errors and improving timeliness.

Participants observed that adequate staffing led to better patient outcomes. This supports the objective assessing the effect of staff shortages on ICU care. Improved staffing also reduced stress and burnout, consistent with Hegarty et al. (2022).

Adequate staffing mitigates delayed responses and reduced monitoring, addressing compromised care quality. It also reduces reliance on ineffective coping strategies, enhancing nurse well-being. These findings support all study objectives and highlight the importance of staffing in sustaining effective ICU operations.

5.5 Conclusion

The study reveals perceived effects of the shortage of staff in the ICU at PMH, Gaborone, Botswana, related to patient care and nurse well-being. Nurses revealed various perceptions regarding staff shortages in the ICU. Issues of compromised quality of patient care, physical and psychological impact on the nurse, ineffective coping strategies, and the role of adequate staffing in patient care were identified. Nurses described that staff shortages have negative effects on their well-being, physically and psychologically, and compromise the quality of care, which in turn affects patient safety. Nurses also presented coping strategies that are ineffective in an attempt to mitigate the challenges caused by the shortage of staff. The nurses also presented adequate staffing as the most effective way to mitigate the challenges caused by staffing shortages as it enabled them to provide optimum patient care. There is a need for collective efforts by government, health care institutions, and nurse managers to strategize ways of reducing staff shortages and monitoring the quality of nursing care in ICUs in order to improve patient safety and nurse well-being.

5.6 Implications of this study to critical care nursing

The perceptions of critical care nurses on staff shortages in ICUs carry significant implications for various aspects of the nursing profession, from practice to research. These insights provide a framework for understanding the challenges faced by nurses and inform strategies to improve patient care and working conditions within critical care settings.

5.6.1 Nursing practice

Staff shortages in ICUs directly impact nursing practice by leading to increased workload, higher stress levels, and the potential for burnout. Nurses may experience difficulties in providing the high level of care needed for critically ill patients, as they struggle to meet the demands of the unit. The shortage of staff can compromise patient safety, increase the likelihood of errors, and hinder the ability to provide individualized care. In response, critical care nursing practice needs to emphasize strategies to manage and mitigate the effects of staff shortages, such as task prioritization, better communication, and fostering teamwork among the remaining staff. In addition, practices that support nurses' mental health and well-being are essential to sustain a capable workforce in the ICU.

5.6.2 Nursing education

The findings from this study highlight the importance of incorporating the realities of staff shortages into nursing education and training. Educators need to prepare nursing students for the challenges of working in high-pressure environments such as ICUs, where shortages can exacerbate stress and strain. Nursing programs should emphasize critical thinking, time management, and coping strategies for handling increased workload and stress. Additionally, simulation-based training can help students develop practical skills for working under pressure, improving their ability to manage situations effectively when faced with staff shortages. Educators should also stress the importance of advocacy for safe staffing levels, ensuring future nurses understand their role in influencing healthcare policy and advocating for adequate resources in critical care settings.

5.6.3 Nursing management

From a management perspective, staff shortages in ICUs demand a reevaluation of staffing models and resource allocation. Nursing leadership must prioritize retention strategies, such as offering competitive salaries, professional development opportunities, and creating supportive work environments to reduce turnover. The findings underscore the need for effective workforce planning, where managers are proactive in recognizing potential shortages and working to address them before they compromise patient care. Additionally, nursing managers can play a pivotal role in advocating for sufficient staffing levels within healthcare organizations and aligning staffing decisions with patient acuity to ensure optimal care. Ensuring that staff have manageable workloads and promoting the well-being of nurses can prevent burnout and improve job satisfaction, leading to better patient outcomes

5.6.4 Nursing research

This study offers valuable data for nursing research, particularly in the area of workforce management and patient care outcomes. Future research could explore innovative staffing models, the impact of nurse-patient ratios on patient outcomes, and the long-term effects of staff shortages on nurse retention and burnout. Researchers can also investigate the effectiveness of interventions, such as flexible staffing schedules or technology solutions, in alleviating the burden of shortages. By understanding the full scope of how staff shortages impact critical care, researchers can help

develop evidence-based strategies to address these challenges and enhance the quality of care in ICUs.

The study of staff shortages in critical care nursing holds vast implications for nursing practice, education, management, and research. Addressing the challenges posed by shortages requires a multifaceted approach, including improved staffing strategies, better preparation of nurses for the demands of critical care, and continuous advocacy for optimal working conditions. Ultimately, this research can inform policies and practices that enhance the quality of care provided in ICUs and ensure the sustainability of the nursing workforce in this demanding field.

5.7 Recommendations

Based on the findings of this study, the following recommendations are proposed to address the poor experiences of nurses associated with staff shortages in the ICU and improve patient care outcomes:

Increase staffing levels

It is essential to increase the number of nursing staff in the ICU to ensure adequate nurse-to-patient ratios. This will help reduce the workload on individual nurses, allowing them to provide more comprehensive and timely care. Implementing policies to recruit and retain more critical care nurses can mitigate the adverse effects of staff shortages on patient care and nurse well-being.

Implement supportive work environments

Creating a supportive work environment through the provision of mental health support, regular debriefings, and stress management programs can help address the psychological impact of staff shortages. Ensuring nurses have access to resources that promote their mental and emotional well-being will enhance their capacity to cope with the demands of their roles.

Enhance training and professional development

Providing ongoing training and professional development opportunities for ICU nurses can help improve their skills and confidence in managing high workloads. Specialized training programs focused on time management, prioritization, and error prevention can empower nurses to handle challenging situations more effectively.

Strengthen communication and teamwork

Implementing structured communication protocols, such as standardized handover procedures and regular team meetings, can improve teamwork and reduce miscommunication. Ensuring that all staff members are on the same page can help minimize errors and enhance the overall quality of patient care.

Adopt flexible staffing models

Introducing flexible staffing models, such as the use of float pools or part-time staff, can provide additional support during peak periods or emergencies. This approach can help ensure that patient care needs are met without overburdening existing staff, thereby improving both patient outcomes and nurse satisfaction.

These recommendations aim to address the root causes and effects of staff shortages in ICUs, promoting a more sustainable and effective healthcare environment.

5.8 Plan for dissemination and utilization of findings

The findings of the study will be disseminated through various methods to ensure they reach a wide range of stakeholders and have a meaningful impact. Internal hospital reports will be prepared and submitted in written form to ensure that the Princess Marina Hospital administration and staff directly benefit from the findings. This method allows for immediate and practical application of the recommendations to improve ICU staffing and policies.

A printed version will be submitted to the UNZA School of Nursing Sciences and the Main Library to provide academic information and enhance students' learning experiences. Additionally, a printed copy will be presented to the Ministry of Health in Botswana to inform policymakers about

critical care nurses' perceptions of staff shortages, potentially leading to improvements in ICU healthcare practices.

Publishing in academic journals will extend the reach of the study to a broader academic and professional audience, contributing to the global body of knowledge on critical care nursing and staff shortages. Manuscripts will be prepared according to specific journal guidelines and submitted to journals such as International Journal of Nursing and Student's Journal of Health Research Africa. Peer review will enhance the credibility and validity of the findings.

Presentations at local and international conferences such as the International Council of Nurses (ICN) Congress and the Critical Care Nursing Conference will be conducted to share the study's findings with a broader audience of healthcare professionals and researchers. Interactive presentations and discussions will be conducted, accompanied by handouts, summary reports, and training materials. Findings will also be disseminated to participants through meetings and executive summaries. This approach is particularly useful for implementing practical changes based on the study's recommendations, ensuring that the insights gained can be applied effectively to improve ICU staffing and patient care practices.

5.9 Strengths and limitations of the study

5.9.1 Strengths

The study had its strengths. The study addressed a critical issue affecting the healthcare system in Botswana, particularly in resource-constrained environments. Staff shortages are a common challenge in low- and middle-income countries, and this study provides valuable insights into how they affect patient care and nurse performance in a critical care setting.

The findings of the study can serve as evidence for policymakers and healthcare administrators to design strategies aimed at addressing staff shortages. It highlights specific areas where improvements are needed, such as staffing ratios, workload management, and resource allocation.

The study provides context-specific information about staff shortages in the ICU at Princess Marina Hospital. Such localized data are essential for developing tailored interventions that

consider the unique challenges and resources of the hospital and the healthcare system in Botswana.

By linking staff shortages to compromised patient care, the study underscores the importance of adequate staffing in ensuring patient safety and optimal outcomes. This aligns with global priorities in healthcare improvement and patient-centered care.

The study not only identifies challenges but also encourages practical recommendations for mitigating staff shortages. This makes the findings actionable and relevant to healthcare stakeholders.

5.9.2 Limitations

The study focused on PMH ICU and the critical care nurses working there, which may limit the ability to apply the findings to other settings or populations of critical care nurses. To mitigate this, the researcher provided a detailed description of the study context, including the characteristics of the nurses and the ICU setting involved. Additionally, comparing findings with existing literature during discussion helps strengthen the transferability of the results. Triangulation of data from interviews and observations to provide a more comprehensive view of the situation also promotes transferability. The researcher has also incorporated the concept of maximum variation sampling where all ICU nurses from different shifts and varying levels of experience from 6 months onwards were included in the study.

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APPENDICES

APPENDIX A: PARTICIPANT INFORMATION SHEET

Study Title: Perceptions of Critical Care Nurses on Staff Shortages in Intensive Care Units at Princess Marina Hospital, Gaborone, Botswana.

Introduction

My name is Mothusi Maika, a student at the University of Zambia doing a Master of Science in Critical Care Nursing programme. To fulfill the requirements for my studies, I need to conduct research on an issue that impacts public health. I invite you to participate in this study, and your contribution will be greatly appreciated. If you have any questions or need further clarification on the information provided, please feel free to contact me

Purpose of the study

The purpose of this study is to explore perceptions of critical care nurses on staff shortages in ICUs, Princess Marina Hospital, Gaborone, Botswana so as to guide interventions for enhancing a positive work environment for critical care nurses and the quality of care for patients.

Benefits of the study

The information collected in this study can help develop interventions to improve nurses' work environments, leading to better job satisfaction and retention. Addressing staff shortages can also enhance patient care quality, benefiting the overall healthcare system.

Study participants

The study will include all the critical care nurses who have worked in the PMH ICU for more than 6 months due to sufficient exposure.

Process for data collection

After consenting to participate in the study, an interview will be scheduled and conducted. With your permission, the interview will be recorded and transcribed. The interview is likely to take

approximately 45 minutes. The researcher will also join regular work shifts to observe and record specific behaviors and actions related to your perceptions of ICU staff shortages while you provide care. During the interview and observations, the researcher will take notes. All collected information will be securely stored in a lockable cupboard, accessible only by the researcher. You will not be required to provide your name during participation.

Voluntary participation

Please note that participating in this study is voluntary, and you are free to decline or withdraw from the study at any time without any consequences. If you choose to participate, you will need to sign the attached informed consent form.

Confidentiality

All information you provide will be kept confidential within the bounds of the law. We will ensure your confidentiality and anonymity by not using your name on any data collection tools or research documents. Additionally, the recorded information will be inaccessible to anyone outside the research team and will be destroyed after the study is completed.

Sharing the Results

After completion of the study, the findings will be shared with you, your institution, Ministry of Health and published in a reputable journal and at conferences without ascribing any identification to you.

Right to Refuse or Withdraw

You do not have to take part in this study if you do not wish to do so. You may stop participating in the study at any point in time that you wish.

Who to Contact?

If you have any questions, you may ask them now or later, even after the study has started. If you wish to ask questions later, you may contact the following:

1. Mothusi Maika, BSc. (researcher)

Cell phone: +26774740851/+260975231612.

Email: maikamothusi@gmail.com

2. Dr Ruth Wahila (supervisor)

   Cell phone number: +260 975971620

   Email address: ruth.wahila@unza.zm

3. Mrs. Phadaless P. Sinkamba, co-supervisor.

   Cell phone +260 97 7422555.

   Email: phada.phiri@gmail.com

Who to contact for research conduct?

If you have any concerns or complaints regarding the ethical conduct of the research, contact the following.

Prof. Sody Mweetwa Munsaka (Chairperson, UNZABREC)

Cell phone number: +260 977925304

Email address: unzarec@unza.zm

APPENDIX B: CONSENT FORM

The researcher has described to me the research process, risks, benefits involved and my rights regarding this study. I understand that my decision to participate in this study will not alter my usual practice as a nurse. In the use of this information, my identity will be concealed. I am aware that I may withdraw at any time. I understand that by signing this form, I do not waive any of my legal rights but merely indicate that I have been informed about the research study in which I am voluntarily agreeing to participate. A copy of this form will be provided to me.

I accept to take part in answering these questions voluntarily to help facilitate the accuracy and validity of this study.

Name of participant…… Signature of participant …….
Date (DD/MM/YY) ……

Name of Witness……...Signature of Witness……
Date (DD/MM/YY) ……

Name of Interviewer …… Signature of Interviewer …….
Date (DD/MM/YY) ……...

Who to Contact?

If you have any questions, you may ask them now or later, even after the study has started. If you wish to ask questions later, you may contact Dr Ruth Wahila on +260975971620.

If you have any further questions, please contact the University of Zambia Biomedical Research Ethics Committee chairperson;

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

Tel: +260977925304 E-mail: s.munsaka@unza.zm

Foromo ya Tumelelo

Mmatlisisi o ntlhaloseditse thulaganyo ya patlisiso, dikotsi, melemo e amegang le ditshwanelo tsame mabapi le thutopatlisiso e. Ke a tlhaloganya gore tshwetso ya me ya go nna le seabe mo patlisisong eno ga e kitla e fetola mokgwa wa me o tlwaelegileng wa go nna mooki. Mo tirisong ya tshedimosetso eno, boitshupo jwa me bo tla fitlhega. Ke a itse gore nka ikgogela morago nako nngwe le nngwe. Ke tlhaloganya gore ka go saena foromo eno, ga ke tlogele ditshwanelo dipe tsa me tsa semolao mme ke bontsha fela gore ke itsisitswe ka patlisiso e ke dumelang go nna le seabe mo go yone ka go ithaopa. Ke tla newa khopi ya foromo eno.

Ke amogela go tsaya karolo mo go arabeng dipotso tse ka go ithaopa go thusa go tlhofofatsa go nepagala le go nna boammaaruri ga thutopatlisiso eno.

Leina la motsayakarolo…… Mosaeno wa motsayakarolo ……..

Letsatsi (DD/MM/YY) ……

Leina la mosupi……...Mosaeno wa mosupi……

Letsatsi (DD/MM/YY) ……

Leina le mopotsolotsi……Mosaeno wa mopotsolotsi …….

Letsatsi (DD/MM/YY) ……...

O ka ikgolaganya le mang?

Fa o na le dipotso dipe, o ka nna wa di botsa gone jaanong kgotsa moragonyana, tota le fa thuto e setse e simolotse. Fa o batla go botsa dipotso moragonyana, o ka ikgolaganya le Dr Ruth Wahila on +260975971620.

Fa o na le dipotso tse dingwe, tsweetswee ikgolaganye le University of Zambia Biomedical Research Ethics Committee chairperson;

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

Tel: +260977925304 E-mail: s.munsaka@unza.zm

APPENDIX C: DATA COLLECTION TOOLS

1. INTERVIEW GUIDE

Study Title: Perceptions of Critical Care Nurses on Staff Shortages in Intensive Care Units at Princess Marina Hospital, Gaborone, Botswana.

Schedule No: …….

Date of Interview: …….

Place of Interview: …….....

Name of Researcher: …….....

Section A: Socio-Demographic characteristics

Gender

Male	
Female	

Level of education

Diploma	
Bachelor degree	
Master degree	

How long have you been working (providing direct care to patients) in the PMH Intensive Care Unit?

……

How many years of experience in nursing?

……

Section B: Effect of staff shortages on provision of nursing care in ICU

How does the shortage of nurses affect provision of nursing care?

Probes:

1. Can you describe specific ways staff shortages impact patient care delivery in the ICU?

2. How do you feel staff shortages affect the quality of care provided to patients?
3. In what ways do staffing challenges influence the workload of nurses in the ICU?
4. Could you share examples of situations where care was compromised due to insufficient staff?
5. How do staff shortages affect your ability to provide individualized patient care?
6. Are there certain patient care tasks that are frequently delayed or omitted due to staff shortages?

Section C: Challenges faced by critical care nurses due to staff shortages in the ICU at Princess Marina Hospital in Gaborone, Botswana

What challenges do you usually face due to staff shortages?

Probes:

1. How do staff shortages impact your physical and emotional well-being?
2. Can you discuss any specific incidents where staff shortages led to heightened stress or burnout?
3. What communication challenges arise among the ICU team when dealing with limited staff?
4. How do staff shortages affect teamwork and collaboration in the ICU?
5. Are there any particular patient safety concerns that become more prominent due to staff shortages?
6. How do staffing shortages influence your ability to attend training or professional development opportunities?
7. Have you noticed any long-term effects of working under staff shortages on your professional performance or morale?

Section D: Coping strategies employed by critical care nurses to manage staff shortages in the ICU at Princess Marina Hospital in Gaborone, Botswana.

Which strategies do you usually employ to manage staff shortages?

Probes:

1. What personal coping mechanisms do you use to handle the stress caused by staff shortages?

2. How do you prioritize patient care tasks when staffing levels are low?
3. Are there any team-based strategies or practices you find effective in managing workload during staff shortages?
4. How does the leadership in your unit support you in managing staff shortages?
5. Have you developed any time-saving techniques or methods to ensure essential tasks are completed?
6. Do you utilize any formal support systems, such as counseling or peer support groups, to cope with the pressures of staff shortages?
7. How do you communicate and collaborate with colleagues to ensure patient care continuity despite staffing challenges?

2. OBSERVATION CHECKLIST

Participant ID:

Shift:

Nurse-to-patient ratio:

OBSERVATION ITEM	FREQUENCY	NOTES
1. Expressions of frustration or stress (e.g., sighing, verbal complaints)		
2. Nurse rushing through tasks		
3. Delayed responses to patient requests		
4. Teamwork and communication to manage workload		
5. Nurse multitasking		
6. Nurse taking breaks		
Additional observations during data collection		
7. Visible signs of fatigue or exhaustion among nurses (e.g., slumped posture, slow movements)		
8. Instances of missed or delayed medication administration		
9. Patient complaints or expressions of dissatisfaction regarding care delays		