To explore the creation of a multi-skilled adoptable/ agile perioperative Registered Nurse

---

A mixed methods study exploring the creation of a multi-skilled perioperative registered nurse at Waikato Hospital

A thesis submitted in fulfilment of the requirements for the degree of Master of Health Science, the University of Waikato, 2025

Abstract

Background: The global nursing shortage has highlighted vulnerabilities within the Aotearoa-NZ health system. Within large acute hospitals, the level of nursing specialisation within perioperative care (preoperative, intraoperative and postoperative) often means that nurses do not have the skillsets to operate across multiple areas and instead focus solely in one area of practice. Issues arise when departments within perioperative services become challenged, either through increased demand or staff shortages. Being able to relocate nurses across the service according to highest demand is important, but often not possible if specialised nurses lack the skills required of working within other areas.

Objective: This study aims to explore the creation of a multi-skilled, agile perioperative Registered nurse equipped with skills to work across the perioperative department in Waikato Hospital.

Participants: The study included two groups of participants. The first consisted of 14 health professionals (Nurse executives, n=4; Nurse operation managers, n=1; Senior registered nurses, n=2; Intermediate registered nurses, n=2; Junior registered nurses, n=2; and Senior specialist nurses, n=3). The second group (survey) consisted of registered nurses at differing levels within the perioperative department (n=88).

Methods: A mixed-methods approach was employed in this study. Qualitative data collected through semi-structured interviews with health professionals working in the perioperative department was analysed using a general inductive method of enquiry. Online surveys were analysed statistically using qui squared and ANOVA to explore the relationship between satisfaction and ability to work across different areas in the perioperative service.

Results: Five key themes emerged from the interviews: (i) Teamwork and role understanding; (ii) The current nursing configuration versus the desirable configuration; nursing skills; (iii) Knowledge and holistic care; and (iv) Leadership; and barriers to change. No statistically significant differences were identified between any of the variables.

Conclusion: The absence of well-organised training for nurses, especially those in specialised areas, poses a significant challenge to develop a flexible workforce. To proceed further, the service should consider developing a training programme, accept cross-training as a method of career development and consider multi-skilling as an essential core part of the of the perioperative workforce.

Acknowledgements

I would like to express my heartfelt gratitude to my husband, Murray Macdonald for his unwavering support, encouragement and understanding throughout this journey. Your belief in me and your constant reassurance have been my greatest source of strength. To my children, Koby and Toyah thank you for your patience, love and for being my motivation to persevere. Always reminding me take breaks, a necessity for mental endurance. I am also deeply grateful to my mother and my in-laws, your kindness, support and assistance have created a nurturing and conducive environment that allowed me to focus on my studies. This achievement is as much yours as it is mine and I am truly blessed to have such a supportive family by my side.

I would like to extend my deepest gratitude to Professor Matthew Parsons for his incredible guidance, unwavering support and invaluable mentorship throughout this journey. Your dedication to fostering academic growth has provided me with countless opportunities to expand my knowledge and skills, for which I am truly grateful. Your patience and encouragement, even during challenging moments, have been instrumental in keeping me focused and motivated. Thank you for believing in my potential and for inspiring me to strive for excellence. It has been a privilege to learn and grow under your guidance.

Thank you, Raewyn Ansley-Price (Nurse Manager) and Michelle Williams (Charge Nurse Manager) for the opportunity to undertake this study, you have always been a source of inspiration and support. Thank you to Rachelle Thomas, Sajith Varghese and Emily Kuiper for always listening to me go on and on about my study. I would also like to sincerely acknowledge Waikato Hospital and University of Waikato for providing the opportunity to undertake this work. Thank you to all those who participated in the interviews and completed the surveys.

Finally, a big thank you to my study "buddy" Christine Woolerton for the many brainstorm meetings we had trying to figure out what we got ourselves into. You were indeed a friend that every person needs to never give up.

Contribution

I, the researcher undertook all aspects of this study under the direct guidance of my supervisors. This entailed selecting the appropriate research design, the data collection and analysis and the publishing of the findings in this thesis.

Dedication

This work is dedicated to my husband Murray Macdonald. Thank you for the sacrifices you have made to walk alongside me every step of the way throughout my academic journey.

Table of contents

List of figures and tables

Chapter I: Introduction

Research is formalised curiosity. It is poking and prying with a purpose.

Zora Neale Hurston, 1903 – 1996

The COVID-19 pandemic has made it clear that traditional nursing models can be adopted and realigned to ensure that care is provided in the best possible manner. Nursing, in areas that share core principles and concepts, such as the perioperative department, can adapt its approach to improve productivity. Adaptation of a new approach is possible through re-evaluation of the current nursing model and its ability to work collaboratively to meet the unprecedented healthcare demands.

As noted by (Longmore, 2024; Pattison & Corser, 2023, p. 649) nurses bore the brunt of many of the health care decisions, including rapid reconfiguration, redeployment to new areas, and working virtually to care for vulnerable patients to respond to the global crisis brought by the rapid emergence of the COVID-19 pandemic. The inability to respond to healthcare demands is undeniable in the New Zealand health system, where failure to meet the community's needs is evident (Bagshaw et al., 2023). It is apparent in a variety of areas, including Te Whatu Ora Waikato surgical services where, patients wait for a minimum of 311 days for spinal surgeries, 170 days for general surgery and 144 days for neurosurgery (Te Whatu Ora Health New Zealand, 2021).

International perioperative nursing models indicate that cross-training perioperative nurses throughout the surgical continuum results in higher operational efficiency, better continuity of care and enhanced workforce resilience. The literature, however, identifies key challenges including resistance to change, deeply embedded professional identities, logistics of training and organisations' resistance to change.

Nursing workforce pressures demand that organisations find better ways to manage daily staffing by preparing and planning for a different nursing workforce (Weston, 2022). As such, there is a need to review the current nursing model and remodel it to meet the needs of a problem unlikely to improve without a significant paradigm shift.

The acquisition and utilisation of extended nursing skills places nurses and the organisation in a better position to respond to crises, including nursing shortage. Therefore, this mixed method study aims to explore the future direction of the perioperative nursing model by exploring the viability of creating a multi-skilled, agile perioperative registered nurse equipped with skills to work across the perioperative department. More specifically, the research aims to address the following questions:

1. What are the views of registered nurses, operational managers and executive nursing managers in relation to how nursing is currently configured within in the perioperative departments at Waikato Hospital?
2. What are the views of registered nurses, operational managers and executive nursing managers in relation to what works well within the perioperative departments at Waikato Hospital.
3. What are the views of registered nurses, operational managers and executive nursing managers in relation to what does not work well within in the perioperative departments at Waikato Hospital.

Chapter II: Literature review

> *Research is to see what everybody else has seen, and to think what nobody else has thought.*
>
> Albert Szent-Gyorgyi, 1893 – 1986

2.1 Literature review, introduction

Conducting a comprehensive review of existing literature is a necessary step for carrying out a research study. This process involves reviewing and analysing good quality literature related to the research topic. Good quality literature can be found in research journals, academic papers, books and other relevant sources. According to Lim et al. (2022), a comprehensive review of the literature enables researchers to identify gaps in knowledge and pinpoint areas where further enquiry is needed. It also helps to define and understand the existing literature related to the study question. The understanding forms the foundation on which new knowledge is built, avoiding duplication. Moreover, the literature review can reveal new evidence and themes that have not been previously explored. Contributing to the advancement of knowledge in the area of study. This research attempts to explore the creation of a multi-skilled, adoptable/agile perioperative registered nurse able to work in several areas across the department.

This chapter is organised in two parts; the first discusses the perioperative nursing configuration focusing on the historic beginnings of perioperative nursing, the evolution perioperative nursing roles and the pivotal moments that influenced the need to explore the creation of a multi-skilled, flexible registered nursing team in the perioperative department at Waikato Hospital. The second part discusses the current state of perioperative nursing in Aotearoa-NZ and beyond, including advantages and disadvantages of creating a multi-skilled perioperative nurse.

2.1.1 Definitions of terms

Defining significant terms within research is essential to establish clarity and ensure understanding of important concepts related to the topic. It provides an accurate

interpretation, preventing assumptions that may otherwise create ambiguity. By defining the terms associated with the creation of a multi-skilled, agile perioperative nurse in Waikato Hospital, a framework for understanding the challenges, benefits and implications of developing the role is established.

Waikato Hospital is a major tertiary health care facility located in Hamilton, New Zealand. It serves as the central healthcare hub for the Health New Zealand Waikato district.

*Perioperative care r*efers to the patient's total surgical experience that includes: the pre-operative; intra-operative; and the post-operative phases of care. The process begins from the time the patient arrives at the reception of the pre-operative care unit to the time they leave the post-operative care unit.

In Waikato Hospital, the *perioperative department* is made up of eight sub-departments including: Day of Surgery Admission unit (DOSA); Operating Theatres (OT); and Post Anaesthetic Care Unit (PACU). Other areas under the perioperative umbrella include: Patient Blood Management Service (PBM); Endoscopy; Interventional Radiology; Inpatient Pain Service; and Anaesthetic Assessment Clinic (AAC). These sub-departments fall under the same umbrella; however, each area is staffed with nurses who work independent of each other despite being closely connected through a shared physical location and common assessment practices.

Nursing Council of New Zealand (NCNZ) is a regulatory authority responsible for the registration and oversight of nurses in New Zealand.

Registered Nurse (RN) is defined by the New Zealand's Health Practitioners Competence Assurance Act 2023 as a health practitioner registered with the NCNZ, which is authorised to perform general nursing functions (Parliament of New Zealand, 2003, p. 116). Additionally, the NCNZ specifies that an RN must practice under the scope of practice for Registered Nurses (2025a). RNs utilise knowledge and clinical judgement to provide care and support health consumers in managing their health. They practice either independently or in collaboration with other health professionals to perform

general nursing functions. They are also responsible for the direction and delegation of Enrolled Nurses (EN), Health Care Assistants (HCA) and others as required (Nursing Council of New Zealand, 2025a).

For the purposes of this study, *a multi-skilled perioperative registered nurse* refers to an RN trained to competently undertake multiple roles within the perioperative department. The undertaking of multiple roles is not a new concept in the perioperative department at Waikato Hospital in perioperative settings across the globe. Nurses in the operating theatre work in multiple specialities, a requirement prescribed by their role description and endorsed by the NCNZ scope of practice for RN.

Nursing competence is defined as the combination of skills, knowledge, attitudes, values and abilities that underpin effective performance of a nurse (Nursing Council of New, 2007). It serves as the foundation for ensuring that nurses are equipped with the skills, knowledge and abilities required to deliver high-quality and safe care across different roles. Competence includes technical expertise and non-technical skills such as communication and teamwork, which are fundamental requirements to undertake nursing roles within the department. In the perioperative setting, these roles include: pre-admission nurse, scrub or circulating nurse, anaesthetic assisting and post-anaesthetic care nurse.

Perioperative nursing is a specialised field of nursing that focuses on providing care to patients before; during; and after surgical procedures. Nurses play a critical role in providing pre-operative assessments, intra-operative care and post-operative monitoring to ensure patient safety. Nurses within these areas work closely with multidisciplinary teams, more specifically anaesthetists, anaesthetic technicians and surgeons. The relationships between teams are closely interconnected and fully dependent on one another for seamless delivery of patient care.

Cross-training / upskilling refers to a process through which nurses acquire skills and knowledge in one or more secondary areas whilst maintaining a primary area of interest where expert knowledge is maintained. From an organisational perspective, cross-training provides workforce flexibility by enabling nurses to adapt and respond to

clinical needs; workloads; patient needs; and operational demands facilitated by multi-skilled roles. Similarly, cross-training provides a platform by which nurses can enhance their skills and knowledge as well as versatility whilst maintaining their area of core interest in nursing. A scoping review by Causby et al. (2024, p. 802) is particularly pertinent as it identified information regarding upskill training for non-critical-care RNs deployed to ICUs during the COVID-19 pandemic. The authors (p. 802) concluded that, "*M*obility flexibility can be associated with positive outcomes such as meeting the needs of understaffed units, higher cost efficiency, acquisition of new skills and insight and increased collaboration between the units. However, studies have shown that flexibly deploying nurses across different work units needs to be used with caution."

Scope of practice refers to the roles; functions; responsibilities; and activities that nurses are competent and authorised to perform by their professional body. The NCNZ define the term 'scope of practice' as the specific area of practice that a nurse works within. The scope of practice conditions determines where nurses may be registered. These apply to Nurse Practitioners (NP), RNs and Enrolled Nurses (EN).

2.1.2 Literature search

The literature review aims to position this study in the context of published work related to research question to establish the key factors that influence the development of multi-skilled perioperative nurses in Waikato Hospital. Keywords were employed when conducting searches through the following databases: CINAHL, AORN, Medline, ProQuest and Google scholar. Such keywords were: 'perioperative department', 'interdisciplinary care', 'perioperative care continuum', 'skill synergy', 'multidisciplinary approach', 'siloed care', 'perioperative care integration', 'nursing cross-training', 'role integration', 'multi-skilled perioperative nurse', 'transferable skills', and 'cross-training'. Manual searches of books, journals such as AORN, Nursing management and Kaitiaki were also undertaken. An extensive literature search revealed a general lack of research focusing on the integration of nursing skills across the perioperative care continuum, especially in Aotearoa-NZ. Nonetheless, a limited number of international research studies related to various nursing roles and cross-training in different areas within perioperative departments were uncovered.

Part 1: Perioperative nursing and need for multi-skilled perioperative Registered nurses

2.2 The beginnings of perioperative nursing

There is minimal evidence of organised nursing education prior to the mid-1850s (Hamlin, 2020). Generally, sick individuals were cared for by family members, domestic servants or religious groups (Dingwall et al., 1988, p. 8). However, caring for the ill and injured transformed with Florence Nightingale's advocacy for better sanitation practices, alongside her push for improved hospital resources (Hamlin, 2020). In the late 1850s, her ideas concerning care captivated the Victorian public, bringing the issues of hospital reform and nurse training to the forefront of the British population awareness (Nelson & Rafferty, 2012, p. 3). Florence Nightingale's principles, in conjunction with various scientific breakthroughs in the latter part of the 19th century, promoted a change in the way care was delivered. This caused a shift from religious orders and home-based care to a structured organised format where trained nurses delivered care in a hospital setting. The shift was further driven by the work of Lister, a British surgeon who was pioneering the use of antiseptic solutions and Pasteur's work on bacteria (Smith, 2012; Theocharis et al., 2024). Their works were instrumental in changing perioperative nursing practices and surgical care in general.

The leap in scientific development led to an increase in the number of surgical procedures performed. The main impetus for perioperative nursing training creating a demand for a skilled nursing workforce to meet the surgical care needs. Initially, nurses were trained to deliver care in all three stages of the perioperative care continuum, including preparing the patient, assisting during surgeries and providing care after the operation (Hamlin, 2020; Nightingale, 2000). However, this slowly developed to nurses training in focused areas, particularly in the operating room. Nurses were required to assist during surgery and undertake other duties such as sterilising instruments and sponges and preparing the patient for surgery (Brumm, 2004). This development and increased demand for trained nurses saw the

establishment of the first formal nursing school run by Florence Nightingale at St Thomas' Hospital in 1860 (dos Santos et al., 2023).

The scientific discoveries in the subsequent centuries led to the establishment of nursing training programmes in United Kingdom (UK) in the 1860s and in United States (US) (McGarvey et al., 2000). Within the perioperative area, trained nurses possessed surgical skills suitable for assisting in surgeries, resulting in recognition as a speciality role, ideal for the work in that era. The creation of this role meant nurses primarily focused on attending to the surgeons' requirements, having a good understanding of each surgeon's 'quirks' and preventing infection (Luce, 1901). The unique requirements made the role prestigious (Clemons, 1976), or in other terms 'specialised'. Other patient care activities including assisting with anaesthetics, recovery rooms and observations during surgery were caried out by ward nurses. Therefore, it became uncommon for perioperative nurses to provide continuous care for the patient before, during and after surgery. Today, perioperative nursing continues to evolve with technological advancements and evidence-based practices, ensuring improved surgical outcomes and patient care.

2.3 Waikato Hospital perioperative department structure

Waikato Hospital is a regional and tertiary teaching hospital providing care to a diverse population of more than 425,000 in an area covering more than 21,000km^2 (Waikato, 2022). The hospital provides acute and elective surgical procedures in all specialties except paediatric cardiac surgery and organ transplant (Pandit, 2018). The perioperative department encompasses a wide range of services categorised into various areas. This study is structured around the three principal phases of perioperative care, which encompass pre-operative, intra-operative, and post-operative care. Within these, the key largest functional areas, including Day of Surgery Admission Unit (DOSA), Operating Theatre (OT) and Post Anaesthetic Care Unit (PACU) are examined. These core areas are further supported by auxiliary departments, which are also part of the study and are addressed within the discussion.

2.3.1 Pre-operative care

The pre-operative phase, also known as the Day of Surgery Admission Unit (DOSA)

serves as the first point of contact for most patients admitted to the Operating Theatre (OT) in Waikato Hospital. Although some patients bypass DOSA for various reasons, including emergencies or arriving directly from the ward at the start of the day; most patients arrive at OT through this unit. DOSA nurses play an essential role in managing the high patient volume that facilitates smooth flow throughout the department. They conduct comprehensive pre-operative assessments ensuring that all necessary documentation and evaluations are completed for seamless integration into the OT.

DOSA nurses play a critical role in preparing patients for surgery and minimising delays to OT. Despite of their role, they often face significant challenges related to staff shortages and could benefit from support of registered nurses who are cross trained from other areas within the perioperative department. These views are noted by (Inman et al., 2005) who highlighted that cross-training can mitigate the negative impact of short-term nursing staff shortages. Similarly, equipping nurses from other areas with the necessary skills to assist in DOSA can enhance flexibility and ensure continuity of care during times of reduced staffing. Cross-training not only alleviates pressure on the DOSA team but also promotes a collaborative environment, enabling departments to work together more effectively to meet patient needs.

2.3.2 Intra-operative care

Waikato Hospital has 24 operating theatres with an additional outlaying theatre located in a different building within the campus. The department has approximately 220 RNs who work exclusively in OT. While they rotate through various specialties with the confines of the department, their roles do not extend beyond the OT environment resulting in practice specialisation. Specialisation in OT nursing is partly because of the current nursing model within the perioperative department that does not support a flexible pathway for cross-training in other areas. Specialisation in OT nursing is further exacerbated by the unique nature of work required to assist in surgeries. Achieving competence requires a prolonged period of learning and practice to attain specific skills necessary to develop knowledge and psychomotor skills needed to practice safely. Specialisation enables nurses to develop expertise in their chosen specialties, enabling them to deliver precise, efficient and high-quality care. It also

enhances patient safety, as familiarity with surgical procedures and equipment utilised minimises errors. Glarcher and Vaismoradi (2024) affirms that practice specialisation fosters professional satisfaction and career growth, as nurses become highly skilled in their role. However, specialisation has inherent limitations, promoting practice isolation and creation of a separatist model; which in turn presents a barrier to providing holistic, integrated care across the perioperative care continuum (Barker, 1996a). The historical development of specialised theatre nursing roles has led to a separation between OT nurses and the ward nurses who historically assisted surgeons with patient care (Barker, 1996a; Castledine, 1992).

2.3.3 Post-anaesthetic care unit

The Waikato Hospital Post-Anaesthesia Care Unit (PACU) operates with a capacity of 28 beds providing a 24-hour round-the-clock service. PACU is part of the perioperative department and specialises in caring for patients post administration of anaesthesia immediately following surgery. The key responsibilities of PACU nurses include closely monitoring vital signs to detect and address any complications from surgery or anaesthesia; assessing and managing pain, often administering medications to ensure the patient is comfortable during recovery; monitoring and supporting patients' breathing; and addressing issues of respiratory distress or blocked airways. They regularly assess surgical sites and surgical drains to identify bleeding or other complications. They comfort patients as they regain consciousness, addressing confusion, discomfort or side effects of anaesthesia. They also respond to post-anaesthesia complications such as cardiac arrest, excessive bleeding or airway emergencies all whilst maintaining accurate records of the patient care.

2.3.4 Patient blood management service

Patient Blood Management (PBM) is a multidisciplinary team of nurses and medical doctors with the aim of improving medical and surgical management to enable patients to better conserve their own blood**.** As a consequence of better management, patients usually require fewer transfusions of donated blood components, thus avoiding transfusion-associated complications (Health New Zealand Te Whatu Ora, 2025)**.** Other services offered by PBM include pre-operative anaemia service**.** Any patient undergoing major surgery who is anaemic is referred to PBM for pre-operative

anaemia management in their surgical journey. PBM also offers education and support where and when necessary to improve the organisation's responsible use of blood products. They also deliver education and support to multidisciplinary teams and partners of the organisation.

2.3.5 Interventional radiology

Waikato hospital's Interventional Radiology (IR) service provides minimally invasive, image guided diagnostic and therapeutic procedures. Most IR work is completed under local anaesthetic with or without light sedation. The IR nurses administer sedation and are responsible for patient monitoring. The types of routine procedures performed in IR include angiography, angioplasty and stenting, embolisation and thrombolysis/thrombectomy. IR caters to all specialties but has a close working relationship with the vascular team located on OT. Vascular nurses at Waikato are trained in some endovascular work involving angioplasty and stenting, meaning that there is, at times a cross-over between the skills that both the IR and Vascular nurses hold. The two teams work collaboratively for hybrid procedures such as EVAR or complex aortic procedures.

2.3.6 The endoscopy service

Waikato Hospital Endoscopy service provides advanced diagnostic and therapeutic procedures for gastrointestinal and respiratory conditions. With a focus on patient care and safety, nurses in the endoscopy department support/assist in both acute and elective cases. Endoscopy services closely work with OT and a considerable number of nursing staff in OT are trained in some aspects of non-complex endoscopic procedures. This is an area where cross-training has demonstrated the benefits of multi-skilled nurses to both the patient and the organisation.

2.3.7 Inpatient pain service

Waikato Hospital's Inpatient Pain Service (IPS) provides specialised pain management for patients with acute, chronic or complex pain during their hospital stay. The service is part of the perioperative department but works across the entire hospital, delivering patient care. The service is led by a multidisciplinary team, senior medical officers, nurses and allied health professionals, who collaboratively deliver individualised care

plans. The team focuses on optimising pain control, improving recovery and enhancing patient comfort and well-being using advanced techniques such as patient-controlled analgesia, epidural infusions and nerve blocks.

2.3.8 Anaesthetic assessment clinic

The Anaesthetic Assessment Clinic (ACC) at Waikato Hospital is a specialised service that evaluates and prepares patients for upcoming surgical procedures. Led by anaesthetists and supported by nursing staff, the clinic conducts comprehensive pre-operative assessments to identify and manage medical risks, optimise health and develop tailored anaesthetic plans. This proactive approach ensures patient safety, improves surgical outcomes and enhances the overall perioperative experience. Most patients undergoing surgery follow the perioperative process. However, a small percentage of patients bypass some stages due to urgency for surgery for life saving purposes or discharge to Intensive Care Unit (ICU) where extubating in OT or in PACU is not required.

2.3.9 The configuration of perioperative nursing within the Waikato Hospital

Perioperative nursing comprises of comprehensive care of patients across the perioperative journey. It includes the roles and responsibilities of nurses during the pre-operative, intra-operative and post-operative areas across the perioperative setting (Williams, 2022, p. 1). However, perioperative nursing is not one continuous role, but a combination of different roles and practices linked by the patient journey. The wide range of activities, knowledge and skills encapsulates the comprehensive perioperative care provided by the ideal perioperative nurse. This is clearly illustrated by the following quote by Shields and Watson (2007, p. 71),

> *A perioperative nurse assumes responsibility for patients once they enter the theatre suite, check the right person is having the right procedure; ensure potential hazards are documented; ensure the site is prepared and, most importantly, discuss the operation with the patient and family to ascertain any anxiety about the surgery. Perioperative nurses liaise with anaesthetists and prepare for positioning on the table, placement of machines, trolleys and tables to maximise comfort for the patient and ease of access for the surgeon and anaesthetist. Liaison with recovery staff begins when the patient enters the suite; they support the family and advise them of progress of the operation. In recovery, the perioperative nurse makes sure that patients are breathing effectively, is*

> *conscious, warm, pain free and with an intact wound before discharging them to the ward.*

Defining perioperative nursing is complex, arising in part from a nursing workforce with sub-departments that operate independently. At Waikato Hospital, perioperative nursing is not clearly defined and consequently, issues arise, as noted by Schonborn and Anderson (2019), who stated that a lack of definition results in an inability to develop an inclusive model of care. Nevertheless, Schonborn and Anderson (2019) further suggest that as more evidence becomes available, the best practice care framework can be developed and standardised in a way that minimises disparities across different areas.

There is a notable absence of a comprehensive perioperative nursing model that explicitly delineates and integrates nursing roles and competencies across distinct perioperative phases and clinical domains. The lack of a well-defined perioperative nursing model in Waikato Hospital is evident in the configuration characterised by a structure where the pre-operative, intra-operative and post-operative phases work independently. D. Suganandam (2019) suggests that all three phases of the perioperative care should be linked seamlessly. However, in reality, it is fragmented and isolated to a particular phase in a particular setting.

While (D. K. Suganandam, 2019) emphasises the need for seamless integration, the reality remains that care is often fragmented, with nurses playing a crucial role in bridging this gap during handover, where collaborative care is most evident. The lack of integration creates an environment where nurses become specialised in the area they work. This limits opportunities for skill integration in care delivery, resulting to missed opportunities that are unlikely to close the gap of skills crossover. As such, it is important to identify the factors that influenced the need to explore the creation of a multi-skilled and flexible nursing configuration.

2.4 The need for multi-skilled perioperative registered nurses

2.4.1 The rapid emergence of COVID-19

The rapid emergence and spread of COVID-19, caused by the SARS-CoV-2 virus, had a profound impact and exposure of systemic weaknesses in health systems and infrastructures across the world (Benjamin, 2020; Filip et al., 2022; Shamasunder et al., 2020). The unprecedented escalation to a global pandemic from the initial detection of the SARS-CoV-2 virus in late 2019 in Wuhan, China, left countries scrambling to respond to the fast-spreading severe acute respiratory disease requiring hospitalisation (Mahajan, 2021; Nuclear Threat Institute and Johns Hopkins, 2020). Subsequently, this placed immense pressure on healthcare workers and exposed systemic weaknesses in public health preparedness (Mahajan, 2021). The pandemic also accelerated emergency response strategies to respond to the increasing number of patients requiring critical care. This necessitated an urgent upskilling of nurses for redeployment to the Intensive Care Unit (ICU) to support the finite resource of critical care nurses (Hampton et al., 2023).

During the early stages of the COVID-19 pandemic, Aotearoa-NZ's strict border closures provided a crucial advantage by buying time for the government to develop and implement an effective response strategy (Wilson et al., 2020). As the rest of the world grappled with the spread of the SARS-CoV-2 virus, Aotearoa-NZ implemented a fast response by closing borders, only allowing homecoming New Zealanders under a compulsory requirement of 14 days of self-isolation (Cumming, 2022). This quickly changed to returnees being actively placed in managed isolation facilities (hotels) for 14 days and later downscaled to ten and finally seven days, with those displaying symptoms screened and placed in isolation (Office of the Minister for Covid-19 Response, 2022). This strategy significantly reduced the risk of imported cases (Jefferies et al., 2020), allowing the health officials to focus on response strategies including: widespread testing; establishing contact tracing systems; and public health campaigns to prevent transmission. Further, the delay in virus entry in Aotearoa-NZ allowed policymakers to assess global response trends and adopt best practices suited to the unique geographical and demographic context (Mazey & Richardson, 2020).

Like other countries worldwide, Aotearoa-NZ faced significant challenges in its preparedness for COVID-19 due to a shortage of nurses among other things. The staffing shortfall projected to strain the country's ability to respond effectively (International Council of Nurses, 2021). The pandemic brought to the fore, the longstanding issue of nursing staff shortages and dependency on internationally trained nurses. The halt of internationally qualified nurses from closed borders, particularly in Aotearoa-NZ, meant that hospitals and healthcare facilities needed to identify other ways to boost nursing resources. One way was to reallocate nurses to areas of higher need in preparation for the projected exponential increased of COVID-19 infections (Hartley et al., 2024). The reassignment involved moving nurses from less critical areas to rapidly upskilling them to handle diverse roles in high acuity areas and in the COVID-19 response teams. The process enabled the implementing of flexible staffing models to meet the anticipated demand projected across the globe. The introduction of upskilling initiatives enabled nurses to undertake multiple roles such as intensive care unit nursing roles and public health duties. Cancellation of elective surgeries created an opportunity to reallocate a staffing resource from the perioperative department to areas of higher need.

According to Chan et al. (2024), cancelling or postponing elective surgery was the most common measure taken, a recommendation by the US Center for Disease Control and Prevention and several surgical societies in the early phase of the pandemic. In Waikato Hospital perioperative department, the cancellation of elective surgeries presented an opportunity to reallocate a tremendous nursing resource from the perioperative department to areas of higher need. This would have provided the nurses with an opportunity to diversify their skills and knowledge necessary to work in various areas. However, the reallocation of nurses did not actualise as nurses were redirected to conduct learning drills on the use of Personal Protective Equipment (PPE) and undertake nursing and organisational compliance education. Similarly, the need for an increased nursing workforce to support COVID-19 response efforts diminished due to the failure of the projected rapid upsurge in COVID-19 infections to materialise. However, this exposed a gap in the nurses' ability to respond to crisis, particularly theatre nurses who reported hesitation to redeployment citing lack of nursing experience in areas beyond OT. Most nurses lacked extended and cross-

disciplinary skills beyond their primary specialities, emphasising the need for a more versatile, multi-skilled nursing workforce optimally prepared during a health crisis. Strengthening workforce training and retention strategies must become a priority to ensure better preparedness for future health crises.

2.4.2 Staff shortages

Aotearoa-NZ has historically faced significant challenges with nursing staff shortages, a critical issue recognised globally within the healthcare industry (Buchan & Catton, 2023; Zipporah, 2024). A report by the Organisation for Economic Co-operation and Development (OECD) (2023) identified that 25 to 30 percent of New Zealand nurses are foreign trained, the second highest in the OECD (Organisation for Economic Co-operation and Development (OECD), 2023). The dependency on internationally trained nurses has filled the gaps, with the Nursing Council of New Zealand reporting that a substantial portion of the nurses come from countries including United Kingdom, India and the Philippines(Kurup et al., 2024; Nursing Council of New Zealand, 2024). The reliance on foreign nurses has made Aotearoa-NZ vulnerable to staff shortages as the competition for skilled nurses intensifies worldwide (Buchan et al., 2022). In the perioperative context, nursing shortages combined with an ongoing issue of lack of appropriate skills mix continues to cause delays in an already strained health system struggling to return to elective surgery capacity undertaken pre-COVID-19 pandemic (Australian Medical Association, 2023).

In developed countries like Aotearoa-NZ, critical workforce deficit is a major issue driven by various factors. These factors include but are not limited to the rising burnout of nurses, which was exacerbated by the COVID-19 pandemic; an ageing population; a transient nursing workforce; an increased demand for healthcare services; and higher attrition rate due to baby boomers' retirements (Gan, 2020).

2.4.3 Financial constraints and workforce retention

Financial constraints is a significant factor influencing the nursing workforce recruitment pipeline in the recent years. Health New Zealand recommends that each organisation generate efficiencies through living within their means over the coming years (Ministry of Health, 2024a). The inability to recruit presents significant

challenges of widespread nursing shortages and disruptions. A recent study indicated that the New Zealand health budget for 2024-2025 provides insufficient funding to address the cost pressures of inflation, wage growth, ageing and population growth, nor does it provide funding to clear planned care backlogs from the COVID-19 pandemic, respond to increasing demand for acute care and meet the government's health targets (Mills et al., 2024).

2.4.4 A transient nursing workforce

The Aotearoa-NZ health system faces a significant challenge with nurses relocating to Australia. This trend is driven by several factors including: Australia's moderate climate which is attractive to internationally trained nurses originating from climatically warm regions; a better working environment; and a relatively open immigration policy, especially for those working in Aotearoa-NZ (New Zealand Nurses Organisation, 2017; Tsujita et al., 2023). The Trans-Tasman Mutual Recognition Act (TTMRA) facilitates the transfer of nursing registration between the two countries (Ram et al., 2025b; Tsujita et al., 2023).

Until late 2024, Aotearoa-NZ offered an easier migration pathway for overseas nurses, which included several weeks in a Competency Assessment Programme (CAP) and lower English language competency requirements compared with Australia. In contrast, the process of nursing registration in Australia involved achievement of a higher language standards and a one-day Objective Structured Clinical Examination (OSCE) (Ram et al., 2025b). This made New Zealand a preferred destination for initial overseas nursing registration, with many internationally qualified nurses (IQN) using it as a stepping stone to settle in Australia (Tsujita et al., 2023, p. 65).

In 2024, the Nursing Council of New Zealand implemented changes to the nursing registration process, eliminating the CAP programme in favour of an OSCE, which has become the sole pathway for IQN registration in New Zealand (Ministry of Health, 2024b; Nursing Council of New Zealand, 2023). The new requirements share similarities with those for nursing registration in Australia. Consequently, these changes are likely to impact the decisions of IQNs considering relocation to Aotearoa-NZ. The realignment of nursing registration with that of Australia also helps to

alleviate the cycle of recruitment and loss of nurses to Australia, as evidence shows that many IQNs view Australia as their ultimate destination (Quinn, 2024; Saafin, 2024).

Nurses migrating to Australia have identified various factors influencing their decision to leave New Zealand. These factors include an unsupportive workplace culture, a lack of professional development opportunities and lower salaries. In contrast, nurses have reported that attractive employment contracts in Australia offer higher wages, improved work-life balance, professional development opportunities and favourable visa conditions for families (Australian Government, 2024). A survey revealed that nearly 50 percent of IQNs either left or planned to leave New Zealand soon after obtaining their registration. The average length of stay for all IQNs in New Zealand was just over 30 months (Ram et al., 2025a). Consequently, Aotearoa-NZ has experienced a 'brain drain,' where experienced nurses pursue better opportunities, further exacerbating the staffing crisis.

According to Health New Zealand (2023), the government has attempted to encourage nursing retention by increasing wages by approximately 43 percent over a three year period. However, despite these efforts, nurses continue to relocate due to conflicting information regarding the extent of the nursing shortage, which creates uncertainty and influences their decisions to stay or leave.

Part 2: The current state of perioperative nursing in Aotearoa-NZ

Perioperative Nursing is the largest nursing speciality in New Zealand (Perioperative Nurses College, n.d). Nurses working in the perioperative specialties across the country practice under the Nursing Council of New Zealand (NCNZ), which is the regulatory authority overseeing nursing practice national wide. The NCNZ sets and monitors standards of practice to ensure that nurses are competent and fit to practice, as per the Health Practitioners Competence Assurance Act 2003 (Association of periOperative Registered Nurses, n.d.).

All nurses are required to operate within their scope of practice which is demonstrated by meeting specific competencies. The competencies outline the skills; knowledge; and attributes that nurses are expected to possess. They ensure that nurses perform their duties competently to provide safe care to patients (Association of periOperative Registered Nurses, n.d.). Additional to the NCNC competencies, perioperative nurses practice under the guidance of Association of Perioperative Registered Nurses (AORN) standards and Lippincott Solutions. AORN is a professional organisation focused on patient safety and standards of excellence founded in 1949 for nurses working in operating rooms and perioperative settings (Benze et al., 2021). AORN standards offer comprehensive directives tailored specifically to the perioperative environment. The standards address fundamental aspects such as infection control, sterile technique and fostering an effective teamwork (Association of periOperative Registered Nurses, n.d.).

2.5 Skills and knowledge of perioperative nursing

Registered nurses working within the perioperative department possess a comprehensive set of clinical skills and knowledge to care for patients throughout the perioperative care continuum effectively. The perioperative care continuum, a term used to describe the entire process of surgical care, is made of three primary phases that include the pre-operative, intra-operative and post-operative, which are further supported by ancillary services that facilitate comprehensive patient management. Each phase has unique skills and knowledge encompassed within the domains of the

Nursing Council of New Zealand's Competencies for Registered Nurses (Nursing Council of New, 2007).

The Nursing Council of New Zealand's Competencies for Registered Nurses are essential for delivering holistic care. They ensure that RNs adhere to the principles of cultural safety; evidence-based practice; and patient safety (Nursing Council of New Zealand, 2025b). These competencies aim to achieve positive patient outcomes and provide a comprehensive framework that supports all aspects of nursing practice, ensuring that care is standardised, equitable and effective. By adhering to these guidelines, perioperative nurses can fulfil the regulatory requirements essential for their practice.

The competencies are organised into four domains that encompass the scope of practice of registered nurses. All nurses are expected to meet the competencies within these domains, which include: Domain one professional responsibility; Domain two, nursing care management; Domain three, interpersonal relationships; and Domain four, interprofessional healthcare and quality improvement. Together, these domains cover the broad spectrum of nursing responsibilities (Nursing Council of New Zealand, 2022). In the context of perioperative care, additional skills and knowledge are necessary to ensure safe practices. Importantly, these specialised competencies still align with the four domains established by the Nursing Council of New Zealand. By integrating these additional requirements within the existing framework, perioperative nurses can provide high-quality care while meeting regulatory standards.

2.5.1 Additional clinical and nursing care competencies

In the pre-operative setting, also known as the Day of Surgery Admission Unit (DOSA), RNs perform comprehensive clinical patient assessments and plan and implement care protocols. This is underpinned by a rigorous care standard clinical practice guideline, all within the boundaries of the Nursing Council of New Zealand's competencies for registered nurses. The clinical competencies place emphasis on: Diagnosis; Planning; Implementation; and Evaluation (ADPIE) in the delivery of safe patient care. DOSA RNs also provide tailored pre-operative and post-operative education to patients undergoing surgery. This is a crucial aspect of their role, as

patients may not have the necessary support to facilitate optimum recovery. The importance of patient education is supported by Blöndal et al. (2022), who state that patient education is statistically significant for making health decisions and managing health before and after surgery for optimal recovery.

As the first point of contact with the perioperative departments, DOSA nurses integrate Whānau-centric approaches in pre-operative care. Recognising the application of the Te Tiriti o Waitangi principle of Partnership, Participation and Protection. This is an important aspect of the role, as it ensures that patients who are already marginalised feel welcome and included. Their cultural values are respected in a space where studies indicate that Māori feel unwelcome (Masters-Awatere et al., 2023). A study highlighting the significance of prioritising indigenous voices and using whānau-centred initiatives found that interventions incorporating Māori worldviews and values will have a greater influence on Māori health outcomes (Reweti, 2023b). DOSA nurses also coordinate with staff from other sub-departments to ensure patient flow and maximisation of efficiency.

The intra-operative nurses, also known as theatre nurses, provide care of the patient whilst they are in OT. Their role is multifaceted, blending technical skill, clinical judgment and effective communication to deliver safe care. All nurses in the intra-operative phase of care are responsible for maintaining a sterile environment and functionality of surgical equipment, communicating effectively for patient safety and collaborating with the surgical team to facilitate smooth operations. The intra-operative nursing role is divided into three sub-categories as follows.

Patient care nurse

In the intra-operative phase, the patient care nurse ensures that all necessary patient pre-operative assessments are completed, including the verification of the patient's identity, surgical site and consents, while addressing any issues that may arise. They communicate with the patient and their support persons to clarify any concerns and help alleviate anxiety and discomfort. As they transfer the patient to the operating theatre, they strive to be a familiar and reassuring presence for the patient. The nurse relays patient assessments to the broader surgical team and provides support and

reassurance during intubation, all while adhering to the surgical safety checklist protocols during the sign-in process. Furthermore, they engage with surgeons, anaesthesiologists and other operating room personnel to promote a seamless surgical flow. This role involves facilitating an open exchange of information that is essential for timely decision-making and effective management of unexpected situations, while also advocating for the patient's safety by voicing concerns when necessary.

Scrub nurse

The scrub nurse role focusses on patient safety by accurately conducting surgical counts and maintaining a sterile environment. Scrub nurses assist surgeons in performing surgical procedures and continuously monitoring the operating field, enabling prompt action to address any breach of sterility. In addition, they utilise appropriate specimen handling protocols and efficiently convey procedural requirements throughout the surgery.

Circulation nurse

Circulating nurses monitor theatre air movement and temperature and are responsible for managing environmental hazards by displaying appropriate door signs, securing electrical cords and other trip hazards and managing traffic flow in and out of theatre. They also oversee the surgical instruments, supplies and equipment necessary for procedures. Accurate documentation of the surgical processes, the team members involved and any complications that occur is a critical aspect of their duties, serving both patient records and legal requirements. Additionally, they support scrub nurses by retrieving supplies, managing specimens and completing surgical counts, all of which contribute to the seamless operation of the surgical team.

Post-operative care nurse

Postoperative care nurses, also known as postanaesthetic care nurses, oversee the care for patients waking from anaesthesia following surgical procedures. They implement detailed observations and assessments of the patients' vital signs and consciousness, escalating where necessary. The role of a postoperative nurse is crucial in ensuring a patient's comfort and safety during their recovery process. These nurses assess and manage the patient's pain, administering medications as needed to promote comfort.

They closely monitor the patient's breathing, addressing any issues including respiratory distress or blocked airways. Additionally, the post-operative nurse assesses surgical sites for potential complications, including bleeding or haematoma formation and maintains accurate records of the patient's recovery, medications administered and any interventions performed. In the event of post-anaesthesia complications, such as cardiac arrest, excessive bleeding or airway emergencies, the nurse provides first response. Therapeutic communication is also a key component of their role, as they provide comfort to patients as they regain consciousness, addressing confusion, discomfort, nausea, vomiting and other side effects of anaesthesia. Furthermore, they keep families informed about the patient's condition and provide clear instructions for ongoing care while advocating for patients to ensure safety in the recovery environment.

2.5.2 Competency in the context of a higher Māori population

The concept of cultural competence originated from the backdrop of the 1960s and 1970s social and political climate that marked the demand for cultural diversity and attention for racial and ethnic inequalities in society (Chiarenza, 2012, p. 67). Cultural competence is defined by Cross (1989, p. 7) as,

> *A set of congruent behaviours, attitudes and policies that come together in a system, agency or among professionals and enables that system, agency or those professionals to work effectively in cross-cultural situations*

Cultural competence requires health professionals to provide health services that are culturally acceptable to those receiving the care. In the Aotearoa-NZ context, cultural competency is embedded in the nursing practice competencies outlined by the NCNZ for registered and enrolled nurses. This is further emphasised by the organisational values set to inform culturally safe care. Underpinned by the organisational policies, cultural competencies encourage the application of Māori values and cultural practices within clinical settings.

One example often utilised in the perioperative setting is the collaboration between clinical staff and Māori support services (Kaitiaki), who provide tailored, culturally appropriate patient support. This is in recognition of their expertise and acknowledgement of their role in delivery of culturally appropriate care. Such

measures, facilitate a more expansive thinking and integration of indigenous viewpoints and practices into westernised healthcare to improve indigenous health outcomes (Reweti, 2023a, p. 10).

Despite the implementation and promotion of cultural safety in the Aotearoa-NZ health context, Māori continue to face significant health challenges. They often experience the effects of what is believed to be the consequences of historical injustices and systemic biases. This dating back to the impacts of colonisation and racism (TE KŌMIHANA, 2022). Some of the adverse health outcomes affecting Māori include chronic conditions, higher mortality rates and shorter life expectancy (Ministry of Justice, 2019). The principle of patient-centred care is interwoven with the concept of Māori holistic care or Hauora. Hauora is based on the Te Whare Tapa Whā health model developed by Sir Mason Durie in 1984 (Durie, 2011). It is based on the concept of wharenui (a traditional Māori meeting house) and emphasises a holistic approach to health. It proposes that, just like a stable house a person's overall well-being is dependent on the interconnectedness of Taha Tanana (physical), Taha Hinengaro (mental), Taha Wairua (spiritual) and Taha Whānau (family and social well-being) with health as a balanced state as opposed to solely on the absence of illness (Durie, 2011).

There is no research that specifically explores the application of Hauora in the perioperative care setting. Nevertheless, the lack of specific guidelines does not prevent the use of guidelines, arising from other more general clinical settings. In Waikato Hospital, the perioperative department places emphasis on the application of Hauora, as it pertains to the return of body tissue; management of placenta (Whenua) and building and maintaining of meaningful relationships, also known as Whakawhanaungatanga. One area worth noting for improvement is the application of Taha Whānau's principle within the perioperative department; where there are current access restrictions for visitors. The Hauora health framework emphasises that whānau support is crucial for a patient's health and well-being. Masters-Awatere et al. (2020) reinforces this idea by stating that whānau, both as individuals and collectively, play a significant role in influencing an individual's health outcomes. Although there are no immediate solutions to this pressing concern, the restrictions inadvertently undermine a fundamental principle vital to Māori health and well-being.

2.5.3 Adaptability and agility in perioperative care

The dynamic nature of modern healthcare necessitates an adaptable and agile health workforce (Saleh et al., 2024). Agility and adaptability are critical components in the perioperative department where nurses are expected to respond to the rapidly evolving technology and complex patient needs. Perioperative nurses are continuously required to learn, familiarise themselves with new technology and techniques (Luck & Gillespie, 2017). Given the rate of advancement, maintaining expertise is not an easy task (Saletnik, 2018), but nonetheless, nurses continue to effectively incorporate emerging technologies, showcasing their remarkable resilience in adapting to new tools and systems to perform their work (Smith & Palesy, 2018). The ability to stay updated amidst these changes demonstrate their adaptability and agility.

The interdependent relationship between theatre nurses and surgeons, combined with their specialised knowledge, has sometimes elevated their status within the nursing specialities. However, this professional distinction can create a sense of disconnection, in turn causing apathy, which can undermine the cooperative approach to investing in a collaborative way of working. A lack of collaboration places theatre nurses at risk of straying from the foundational principles of nursing. Similarly, complacency in theatre nursing risks the false assumption that their roles are indispensable. The view that skills and expertise are irreplaceable is problematic as surgical robotics, particularly robotic scrub nurses (RSN) have the potential to become an attractive addition to the operating room. Indeed, RSNs have the ability to surgically assist in procedures with more precision and accuracy compared with manual assisting, traditionally undertaken by nurses (Hampp et al., 2019; Jacobsen et al., 2020). Moreover, the potential to enhance safety and efficiency in the surgical process, along with the reduction of infection risks, make robot-assisted surgeries appealing (Zemmar et al., 2020).

Research involving 35 operating room nurses at a training and research hospital located in Western Turkey, examining the potential of Artificial Intelligence (AI) and robotic nurses replacing operating room nurses revealed that the vast majority of the nurses, (71.4 percent, n=25), did not perceive that robots could replace them, which conflicted somewhat with the views of nurses towards the benefit of robots to nursing; Over three quarters (77.1 percent, n=27) of the nurses thought that robots would benefit

nursing and 80 percent (n=28) stated that robots would reduce the workload for nurses (Ergin et al., 2023).

Tredinnick (2017) raises concerns regarding the impact of artificial intelligence (AI) by suggesting that AI poses a threat to the existence of many professional fields, especially those in the law and medicine. Similar concerns are reflected in another study that included 250 employees in the four largest hospitals in Riyadh, Saudi Arabia. The study indicated that 78 percent (n=250) of the participants were concerned that AI would replace them (Abdullah & Fakieh, 2020).

Furthermore, the role of perioperative nurses, particularly theatre nurses, remains a contentious issue due to the historical evolution of parallel roles, such as operating theatre technicians, also known as surgical technicians. The role originated in 1945 under the designation of the operating theatre technician, later evolving to Operating Department Professionals (ODP). This profession, commonly operational in the UK, US, Australia and other parts of Europe, has continually advanced its practice and expertise. This led to formal recognition in 2017 as one of the Allied Health Professions (AHP) (College of Operating Department Practitioners, 2021).

The development of the ODP role raises a fundamental question concerning RNs in the operating theatre. This is because ODPs can effectively undertake tasks such preparing the patient environment before surgery. These including assisting in patient preparation, preparing and organising surgical tools, performing the surgical count and scrubbing. These roles were traditionally undertaken by RNs (Abbott & Booth, 2024; Al-Oufi et al., n.d). Nevertheless, research indicates that nurses possess unique qualities and expertise underpinned by critical thinking (Mohanasundari et al., 2023). These critical thinking elements intrinsic to the nursing profession would be difficult to readily incorporate into ODP roles. Similarly, the human elements of caring roles cannot be replaced by robots or AI. Theatre nurses can swiftly respond to issues, making informed decisions in high-pressured environments. As such, with the advancement of technology, the delivery of nursing care must evolve, along with some traditional nursing values and philosophies that are foundational to the nursing practice. It is also important to acknowledge that technology has its place and care

delivery can be transformed by integrating technology to enhance the care that nurses provide rather than replace them. Similarly, it is pivotal for the perioperative nursing workforce to reflect on and identify the point of difference that distinguishes their role from that of ODPs as a way of asserting their relevance. A necessary move towards a future where emphasis on reducing operational costs while maintaining a high standard of care continues to be the focus of health systems.

2.5.4 Multi-skilled perioperative nursing, international models

There is limited evidence in the literature supporting perioperative care models that integrate nursing roles across multiple areas within the perioperative department. Conventional perioperative nursing models invariably operate independently and lack a clearly defined framework that integrates the nursing role across the perioperative phases. Nevertheless, health organisations across the world continue to operate with increasing workloads, staff shortages and complex care requirements, using traditional models that, while historically effective, may benefit from strategic refinement. However, certain countries have made attempts to address these issues and are presented here.

2.5.5 Integrated perioperative nursing role in rural Australia

In Western Australia, perioperative nurses are trained to practice in extended roles with duties that include scrubbing, scouting, anaesthesia assistance and post-operative care (Platt et al., 2019). These roles enable nurses to rotate within the services, addressing patient needs and departmental demands and ensuring optimal workforce capacity during peak periods. The role is similar to the RNAA role established in Aotearoa-NZ in 2018 in response to a critical shortage of Anaesthetic Technicians. It involves cross-training RNs whose scope of practice merged well into the Anaesthetic Technician assistant role and can work interchangeably (Mitchell et al., 2020). The RNAA role enables nurses to transition between roles without interruption, ensuring business continuity in operating theatres. As a result, operating theatre utilisation rates have been found to have increased by 15-20 percent in operating theatre departments that have adopted multi-skilled nurse teams (ACORN, 2024).

Additionally, staffing efficiency has been enhanced, especially at peak hours, with multi-skilled nurses filling in to replace critical positions when absences or patient volumes increase. This model has had a positive impact in addressing workforce shortages and enhancing efficiency in care delivery, particularly in rural sectors where staffing is often at its weakest (Kuthan et al., 2016).

2.5.6 Integrated perioperative nursing role in rural Singapore

In Singapore, cross-training of nurses is a common practice within public and private facilities. As noted by Phua et al. (2023), this was prompted by the recognition that there are increasing nursing workforce shortages worldwide against a backdrop of growing demand for healthcare services. Cross-training of nurses as a means of preparing them to respond to emergency situations is a strategic measure, crucial to developing a nursing workforce that can be redeployed in areas of higher need. Evident in the Singapore National Eye Centre (SNEC), five percent of OT nurses are cross trained in each ambulatory services unit in a year. This enhances OT nurse preparedness for redeployment.

A study exploring the perceived preparedness of general nurses prior to deployment to intensive care units during the COVID-19 pandemic in Singapore found that nurses believed they were inadequately trained (Tang et al., 2021). They further believed that the course offered was too brief to provide sufficient knowledge and skills to care for critically ill patients. Lessons learned from unpreparedness necessitated urgent contingency measures, such as workforce upskilling. The study also suggested that during peacetime, hospital management could consider regular cross-training programmes and structured deployments among clinical departments. These measures would encourage the sharing of knowledge among nurses, allowing them to diversify their approaches to patient care management and, as a result, become more adaptable to change (Kaur, 2020). The value of cross-training and multi-skilling can be adopted and implemented to ensure that the nursing workforce is agile and adaptable to changing needs, including those affecting the global health system.

2.6 Barriers to creating a multi-skilled, perioperative nurse

2.6.1 Practice specialisation

Sub-specialisation refers to a profession's refinement in a specific area of expertise within the broader field of the profession (Wang et al., 2016, p. 1). It alters traditional roles to a deeper level, allowing for the refinement of skills and knowledge in a more focused manner. Essentially, it is about taking a well-established profession and exploring the many nuances that make it even more specialised (Wang et al., 2016, p. 1). Advancements in medical knowledge and technology have led to a global increase in subspecialisation (Oren et al., 2020). Thus, the establishment of nursing subspecialties in alignment with medical advances is an unequivocal conclusion essential to keep abreast of and continuing the development of nursing sciences (Wang et al., 2016). To ensure the nursing profession keeps pace with the evolving advancements; it is essential to acknowledge the specialised nature of the perioperative department (Wang et al., 2016, p. 121). Nurses within the perioperative department must attain specialised knowledge unique to the phase of the care continuum. This is in addition to the base knowledge acquired through training and regulated by the Nursing Council of New Zealand, the regulatory body that registers nurses in Aotearoa-NZ. Unlike most areas where the nursing practice is generalised and nurses can safely apply transferable skills, perioperative nursing is distinct with complex and specialised challenges, which, if not well understood, can compromise patient safety and increase the risk of adverse outcomes (Laflamme, 2017; Sitta Martins et al., 2023).

One area that highlights the specialisation of care is the intra-operative phase of nursing care. A significant part of operating theatre nursing is unlike any other area and includes practically working in an intertwined manner with other multidisciplinary professions, including surgeons, anaesthetists and technicians. A significant challenge in recent decades is that healthcare is now delivered by multidisciplinary teams rather than in singularity. While this has a positive outcome, as the quality of care delivered is proportional to the effectiveness of such a multi-professional team (Ahmed, 2019a), it creates various operational challenges, including decision-making, communication and hierarchical differences. This complexity is further compounded by the patient's

vulnerability, which demands unwavering advocacy, a nursing role expectation even amid other dominant professions (Chellam Singh & Arulappan, 2023).

One risk to nursing specialisation is the development of narrow-focused practice. The risk of a narrow focus is described by Kumari et al. (2024), who state that specialisation provides depth of knowledge on a specific aspect of healthcare but limits the breadth of understanding. A deep understanding of narrow aspects creates the risk of neglecting common disorders (Kumari et al., 2024, p. 568). The same study indicated that specialisation of healthcare professions can result in a high cost of health care, exacerbated by additional services offered during their visits. Nevertheless, a different view of practice specialisation argues that whilst the origins of specialisation have long historical and cultural roots, it is a trend that cannot be stopped (Britnell, 2011). Britnell (2011) states that specialisation is a necessary part of modern medicine, resulting from advancements in technology that have made procedures complex yet compelling. This necessitates that nurses continually upskill to keep pace with technological advancements.

In Aotearoa-NZ, the specialisation of nursing practice has become more prevalent in the designated senior nursing roles and within the perioperative care. Roles, such as Surgical First Assistants (SFA) and Registered nurse anaesthetic assistants are recognised by the NCNZ as expanded practice. However, at an RN level there are fewer areas considered to be specialised due to the unique nature of practice that is not easily transferable without additional academic training. Te Whatu Ora – Health New Zealand (2023) recognises that nurses must be supported to develop necessary skills to ensure service resilience and address future healthcare requirements.

A review by George et al. (2019) highlighted that while specialisation in nursing has improved technical expertise, it has equally created challenges for workforce agility. The review sentiments are reflected in perioperative nursing where; nurses tend to specialise intensively within one aspect of perioperative care. Narrow-focused specialisation hinders mobility across various roles, undermining a flexible, multi-skilled workforce capable of providing safe care in diverse areas within a healthcare setting (Australian Government Department of Health, 2021).

As such, although specialisation is an essential element of safe and efficient surgical care, there is an increasing realisation that nurses must be supported to develop multi-skilled competencies to ensure service resilience and address future healthcare requirements. Specialisation improves patient outcomes by enabling health professionals to specialise in specific practice areas, thus developing special skills and expertise in providing care. Specialised health workers, such as theatre nurses, can develop an understanding of the nuances of the practice, resulting in better decision-making, patient safety and higher competence levels of practice.

2.6.2 Culture

Workplace culture encompasses the cultures of both the organisation and the department. The departmental culture is defined as the social, behavioural and cultural norms, values and beliefs within a department (Mayes & Cochran, 2023). The culture of familiarity and comfort within specialised practice areas hinders the uptake of learning opportunities intended to diversify nursing skills and knowledge. Literature indicates that the desire to stay in a familiar environment is a key factor in reluctance to engage in cross-training (Platt et al., 2019). Comfort within a particular area of practice leads to job satisfaction. Changes to the status quo can create anxiety about the future, as individuals may fear that their intrinsic rewards and overall well-being will be negatively impacted (Cheraghi et al., 2023, p. 6) Consequently, when people feel that their well-being is at risk, they often resist potential changes to protect it (Deci & Ryan, 2013).

Another barrier to cross-training is the rigidity of professional boundaries. There is widespread recognition that professional boundaries act as obstacles that impede collaboration among various professional groups, as professionals intentionally utilise these boundaries to manage and safeguard their areas of expertise (Abbott, 1988; Farchi et al., 2023). While the concept of professional boundaries appears to be increasingly embedded in professional bureaucracies (Mintzberg, 1979, as cited inFarchi et al., 2023, p. 278); an unwelcoming environment is created where individuals outside the established team feel excluded. Making it difficult to foster a collaborative learning environment outside designated areas.

2.6.3 Change

Nurses report reluctance to adapt to change due to unclear communication about personal benefits, a perceived lack of time, a lack of inclusion and involvement in the planning of change, a lack of trust and burnout from past change initiatives or simply a general reluctance to change. This reluctance prevents the adoption of innovative strategies that could foster a more flexible, multi-skilled workforce, ultimately hindering improvements in teamwork and patient outcomes. As such, for a meaningful change to occur, leadership must address both the organisational structural aspects and the personal apprehension of individual nurses.

2.7 The current nursing configuration

2.7.1 The absence of established pathways

A study investigating a newly proposed integrated model of perioperative care reported that the current perioperative care is known to be fragmented (Desebbe et al., 2016) with significant variation reported from when patients start contemplating surgery through the perioperative process until full recovery is achieved (Pagano et al., 2025). The absence of an established pathway that effectively integrates nursing roles within the perioperative department could be attributed to several factors. These may include the large size and complexity of the department, which make it challenging to collaborate on learning. The lack of a structured framework to guide the role delineation and collaborative learning outcomes. Nevertheless, integration and cross-training can be formally commenced in areas that are already working in an integrated format, such as vascular theatre and IR or paediatrics theatre and endoscopy. Similarly, OT is an area of great potential for integration of skills. This is because OT has the highest number of RNs in the entire perioperative department but have the highest numbers of staff with limited cross-over skills. This is despite having comprehensive nursing knowledge necessary to deliver surgical care across the perioperative care continuum. Participants in the qualitative interview identified this as a concern as it was viewed as poor utilisation of the nursing resources. It was also noted that OT nurses lacked comprehensive nursing knowledge and, instead, delivered epizootic care.

A review of the reasons why theatre nurses are often perceived as lacking knowledge and skills revealed that this assumption stems from a traditional view of nursing, which

focuses mainly on performing nursing tasks. However, this perspective overlooks the complex roles nurses play. Operating theatre nurses build rapport with patients, ensuring all safety checks are completed accurately for a smooth transition to surgery and alleviate patient anxiety, all while minimising theatre downtime.

The perception that theatre nurses lack nursing skills and knowledge neglects the multifaceted roles played those nurses. In the operating theatre, nurses are required to promptly establish rapport with patients ensuring feelings of safety and trust that they will be cared for before, during and after surgery. Nurses often operate within limited timeframes in which they must rapidly establish rapport and trust with patients, an essential component in alleviating patient anxiety. This achieved through therapeutic communication. According to Wang et al. (2022) effective communication is vital in managing anxiety and building trust, particularly in operating theatre where high levels of anxiety exist.

Nurses are also required to verify every aspect of patient safety including verification of the patient's identity, accurate documentation including consent and ensuring surgical site is accurately marked among other assessments. All while balancing patient safety with reducing theatre downtime and disruption of surgical flow, a major health system push aimed at maximising theatre efficiency. The ability to multi-task requires high-level clinical understanding, rapid decisions and the capacity to deal with numerous factors at once. Their ability to meet the above expectations reflects on the extent of their expertise and contribution to effective and safe care. Evidence-based care in the operating theatre requires nurses to possess both technical knowledge and emotional intelligence, being attuned to the patient's experiences and feelings throughout the perioperative process to effectively advocate for their care (Pulkkinen et al., 2016). This highlights that the perceived lack of skills and knowledge is baseless, only fuelled by a narrow understanding of theatre nursing, which fails to acknowledge the broader competencies involved.

These expectations place increased pressure on nurses to work efficiently without reverting to a task-orientated model of delivering care. A study investigating the role of theatre nurses concluded that the theatre nursing role must shift from the needs of

the surgeons and hospital management, instead align with the needs of the patient through building closer working relationships with nurses from other areas within the hospital to ensure the needs of the patient are met before, during and after surgery (Blomberg et al., 2022). Literature failed to confirm the assumption that theatre nurses lacked knowledge and skills in other areas of nursing.

Nevertheless, the literature indicates that despite the role of theatre nursing being ambiguous with doubts that what they do is even nursing, their work around the operating table is paramount (Mardell, 1998). The calmness and capability of theatre nurses in moments of crisis has saved lives. Similarly, trust is established during a short and straightforward interaction with a vulnerable patient before surgery is complete (Mardell, 1998).

2.7.2 Models of care

Johnston (2025) reported there is no single model of care used consistently across the healthcare setting, including the perioperative care continuum. The lack of uniformity in the perioperative department is due various reasons including but not limited to; patient presentation pathway, electively or via emergency; patient acuity; multidisciplinary involvement; staff skills and knowledge; and staff availability. These reasons pose a major challenge in establishing a consensus on the ideal model that suits all areas, particularly one that effectively integrates the nursing workforce. The challenges hinder progress and compel to persist with traditional care models, which are increasingly unsustainable and likely to become unviable in the health landscape that is facing increasing workloads, increased complex care requirements and staff shortages.

2.7.3 Traditional perioperative care

Traditional pre-operative care involves various assessments and interventions to improve surgical outcomes. This process typically includes discussions with patients and various diagnostic examinations, with the surgeon as the primary decision-maker (Johnston, 2025; Vine et al., 2024). The approach follows a well-established chronological process that adheres to recognised practices and relies on the surgeon's experience and expertise to guide decisions about patient care. While this model can

expedite decision-making, it often lacks input and collaboration from other professionals, which can lead to missed opportunities for error detection that colleagues might otherwise identify.

2.7.4 Protocol-driven care

The protocol-driven care model emphasises enhancing patient outcomes to accelerate the recovery process. A prominent illustration of this model is the Enhanced Recovery After Surgery (ERAS). This approach seeks to reduce physiological stress on the patient by implementing sufficient anaesthesia and pain management techniques. It also focuses on elements such as perioperative education, minimisation of fasting, nutrition support and early mobilisation. The use of protocol has been shown to reduce post-operative complications, reduce the length of hospital stay and readmission and deliver financial improvements to healthcare systems. The key benefit to this model is that it provides consistent, streamlined processes that are easier for staff to learn and implement. Their outcome can also be easily tracked. Despite the benefits of standardisation of care, ERAS has been criticised for the demanding need for resources and staffing, the time-intensive nature of continuous protocol monitoring, the risk of outdated practices and the prioritisation of guidelines over patient-centred care.

2.7.5 Multidisciplinary approach

This includes a collaborative approach from different healthcare professionals to achieve patient goals. A key advantage of this model is the ability to consolidate different skill sets and experiences and share responsibilities. One significant disadvantage is the heavy reliance on staff leading to delays that can be detrimental to time-critical care. In the perioperative department, the multi-disciplinary approach includes surgeons who plan and perform surgical procedures and anaesthetists who administer anaesthetic medication, manage pain relief and monitor the patient's physiological changes. Nurses implement the developed perioperative protocols and advocate for the patient's needs.

2.7.6 Patient-centred care

Holistic-centred care is the most preferred model of care in Aotearoa-NZ. It prioritises the patients' needs and preferences, involving them in decision-making. The care model encourages a collaborative approach with the patient and their family and support system. The holistic care approach places emphasis on empowering the patient to make decisions and have control of their care, placing them at the centre of care management (Berg et al., 2019). It endeavours to establish what matters most to a patient and define what success looks like for them. While giving the patient control of their care, health professionals are cautioned about managing conflicts and complexities that can arise when managing patient expectations. Holistic care advocates for compromises that allow patient autonomy whilst delivering evidence-based practices.

2.8 The perioperative dialogue nursing model

The Perioperative Dialogue Nursing Model (PDNM) is widely discussed in literature. It is a patient-centred approach focused on continuity of care, communication and relationship-building between nurses and patients throughout the surgical process (Pulkkinen et al., 2016). This model promotes integrating pre-operative, intra-operative and post-operative nursing care into holistic patient-centred practice; while simultaneously challenging the traditional model of task-oriented care (Pulkkinen et al., 2016). The PDNM is grounded in humanistic theories, particularly those focusing on emotional support, the establishment of trust and the promotion of autonomy. Two of such theories that align with the PDNM's core principles are Watson's theory of human caring, which places emphasis on the importance of meaningful nurse-patient interactions (Smith, 2019; Watson, 2008) and Peplau's theory of interpersonal relations (Peplau, 1988). Peplau's theory emphasises the importance of meaningful nurse-patient interactions. The key components of PDNM aim to deliver person-centred communication across the perioperative journey to reduce anxiety and improve patient outcomes. The key components of the PDNM include:

1. **Pre-operative phase** Establishing a therapeutic relationship between the nurse and the patient. Included is a significant focus on education, setting expectations and reducing anxiety. The nurse should provide psychological and emotional support to improve surgical preparedness (Lindwall & Von Post, 2009);

2. **Intra-operative phase** This is where the nurses must strive to establish rapport and trust in the shortest time possible. The presence of a familiar nurse provides a sense of security and continuity of care. The nurse also advocates for the patient, ensuring their individual needs are met (D. K. Suganandam, 2019); and
3. **Post-operative phase** The nurse continues the nurse-patient relationship by providing pain management support, reassurance and comfort and recovery education when the patient is ready (D. K. Suganandam, 2019; K. Suganandam, 2019).

A study exploring the benefits of PDNM identified that patients who experience continuous nursing dialogue have lower post-operative pain levels and report a greater sense of psychological well-being (Dias et al., 2022). Unlike traditional perioperative care models, which often involve fragmented interactions, patients express feelings of confidence in their care when they interact with the same nurse throughout their surgical journey (Lindwall & Von Post, 2009). Due to the continued meaningful interactions, nurses experience greater professional fulfilment and a sense of purpose in their work through job satisfaction and reduction of emotional exhaustion (Pulkkinen, 2021).

2.8.1 Criticism of the perioperative dialogue nursing model

While PDNM has many positive advantages, it is difficult to implement. Staff shortages, shift work and high patient turnover hinder the ability to maintain continuity of care. A study by Eriksson et al., (2018) found institutional constraints, such as rigid scheduling and resource limitations, hinder the adoption of this model. Time constraints and the organisational push to maximise efficiency unintentionally revert nurses to traditional perioperative nursing, which is task-oriented, focusing on efficiency and procedural aspects. Similarly, resistance to adopting a more relationship-based approach could arise due to time constraints and perceived workload increases (Mitchell, 2015). Further, formal education concerning the importance and application of PDNM is not well-developed, particularly at the undergraduate level. As such, efforts must be made to incorporate communication and relational skills in training programmes to effectively support nurses in implementing the PDNM model.

2.8.2 Empirical evidence on the effectiveness of PDNM

Numerous studies have examined the influence of PDNM on patient care. A qualitative study by Lindwall and Von Post (2009) reviewing patient engagement experiences with perioperative dialogue found that patients felt more acknowledged and included in their care. Similarly, a randomised controlled trial by Pulkkinen et al. (2021) concluded that perioperative dialogue reduced anxiety in patients and enhanced their post-operative recovery experiences. However, other studies argue that the success of PDNM is dependent on organisational resources and support. A meta-analysis conducted by revealed that although PDNM enhances patient satisfaction, its efficacy is reduced in high-volume surgical environments where nurses cannot give personalised attention.

2.9 The current state of perioperative nursing in relation to the research in New Zealand and beyond

2.9.1 The existing perioperative nursing landscape

There is limited cross-training among different areas of perioperative nursing, and this lack of cross-functionality is concerning, particularly in light of staffing shortages and the lessons learned from the rapid emergence of the COVID-19 pandemic. The current setup tends to restrict nurses to their specific roles, which undermines the operational resilience of the workforce during periods of high demand. Perioperative nursing face similar challenges worldwide. In countries such as Australia, Singapore, the UK and the US, perioperative nurses perform comparable roles within surgical services. However, there is a growing demand for these nurses to develop competencies across multiple stages of perioperative care.

Many health systems are moving towards team-based, patient-focused care models that emphasise cross-training and flexibility to meet evolving healthcare needs. For instance, Australia has implemented perioperative upskilling programme to address nursing shortages. In the US, several hospitals have created models where nurses rotate through scrub, circulating and PACU roles to enhance operational efficiency. Despite these advances, perioperative nursing globally remains in a state of transition. Organisations increasingly recognise the urgent need for greater agility, multi-skilling and integration within the perioperative services to improve resilience based on lessons

learned from the global pandemic. Perioperative nurses in Aotearoa-NZ and elsewhere are highly trained and play vital roles in surgical care. However, there is an ongoing aspiration to develop a more flexible and multi-skilled nursing workforce. The growing belief is that enhancing broader competencies and adaptability will be crucial for the sustainability of perioperative care as the healthcare landscape continues to evolve.

2.9.2 Challenges, barriers and possible future direction of the perioperative nursing

The perioperative nursing configuration in Waikato Hospital faces multiple challenges that hinder the creation of a more flexible, agile and multi-skilled nursing workforce. These challenges span from organisational to individual nurse levels, as discussed earlier in the chapter. One of the main contributing factors to the current configuration is the high level of specialisation required in perioperative nursing positions, especially in OT nursing. While this specialisation is crucial for ensuring technical excellence, it creates silos that limit workforce adaptability. Nurses often have expertise in one aspect of perioperative care but forego other transferable skills that can be acquired and embedded through cross-training. The rigid structure restricts the department's ability to respond quickly, particularly during understaffing or in emergent situations such as the COVID-19 pandemic. A shortage of nursing staff can lead to surgery cancellations or, worse, delayed treatment, which can lead to disease progression. Additionally, these constraints hinder operational responsiveness, leading to delays in critical decision-making and adaptive measures necessary for maintaining service continuity.

Prioritising a continuous culture of lifelong learning, agility and collaborative practice is vital to developing an adaptive perioperative workforce that can meet the expanding needs of contemporary healthcare. Future studies should aim to assess the outcomes of cross-training models and establish evidence-based practices that promote the sustainable development of perioperative nursing. Moreover, the current system lacks comprehensive frameworks to facilitate cross-training among perioperative nurses. In Aotearoa-NZ perioperative nursing can be informed by the RNAA programme that has successful cross trained nurses to support a profession that was in dire shortage of

staff. In collaboration with Professional Development Unit (PDU) educational support, the RNAA programme can be used to benchmark a programme that facilitates the creation of multi-skilled agile perioperative RNs. The Perioperative Nurses College and the New Zealand Nurses Organization are dedicated to the professional development of perioperative nurses, offering resources and education opportunities. However, the emphasis remains on enhancing skills within existing specialities rather than promoting cross-speciality training.

In summary, the current configuration of perioperative nursing at Waikato Hospital is shaped by specialisation, personal preferences and a lack of cross-training pathways. Resulting in a workforce that operates primarily within siloed specialties. Addressing these challenges would require the development of structured cross-training programme and a cultural shift towards valuing versatility alongside specialisation.

2.9.3 The evolution of roles and the pivotal moments that influenced the need for exploring the creation of a multi-skilled, agile perioperative nurse

The perioperative nurse's role has grown over the years, influenced by advances in the science of medicine, healthcare delivery changes, technology advancement and evolving patient needs. Traditionally, perioperative nurses served across the surgical care continuum from pre-operative preparation to intra-operative assistance and post-operative recuperation, providing holistic comprehensive care. As healthcare became increasingly specialised, perioperative nursing roles became more selectively focused, spurring the compartmentalisation of duties into distinct phases such as pre-operative care nursing, theatre nursing and post anaesthetic recovery unit nursing. Although specialisation has enhanced technical expertise and patient protection, it has also spawned siloed practice models, diminishing adaptability and confining the extension of nursing skills throughout the perioperative care continuum.

A number of key milestones have underscored the necessity to reassess and remodel perioperative nursing models. The COVID-19 pandemic has been particularly significant, revealing weaknesses in inflexible staffing models and the value of adapting to changing requirements through varying competencies. While Aotearoa-NZ was not

heavily impacted by the COVID-19 pandemic as many other countries, it necessitated some redeployment of nursing staff to support pandemic response efforts. This reinforced the challenge of delivering patient care if nurses are constrained to narrowly prescribed roles. A key lesson learned is the importance of ensuring that the Aotearoa-NZ health care system remains prepared, with robust workforce planning and surge capacity strategies in place.

In addition, global shortages of nurses, technological changes and increasing patient acuity have served to underscore the necessity for perioperative nurses to have broader, more flexible sets of competencies. These pressures have prompted the exploration of development of a multi-skilled, adaptive and agile perioperative nursing model to deliver an adaptable workforce able to easily switch between roles, thus increasing resilience, enhancing patient outcomes and providing operational efficiency within an ever-changing healthcare landscape.

Chapter III: Methodology

The power of statistics and the clean lines of quantitative research appealed to me, but I fell in love with the richness and depth of qualitative research.

Brené Brown, 1965 to current day

3.1 Methodology, introduction

Methodology is a systematic analysis of the methods used in research. It outlines how data are collected, analysed and interpreted to answer the research question, ensuring the research process is structured, credible and replicable (Kumar & Praveenakumar, 2025; Sileyew, 2019). The analysis forms the basis by which the research approach is anchored, supported by the underlying theoretical and philosophical framework. The researcher's role is to ensure that the research process is well planned, executed and reported to produce credible results. The success depends on the researcher's expertise and adherence to the established methodology. This chapter identifies and outlines the methodologies applied in this research.

A mixed method approach encompassing qualitative and quantitative data is employed to establish healthcare professionals' perspectives on creation of a multi-skilled agile perioperative nurse within Te Whatu Ora Waikato perioperative department. A discussion of the methodology implemented within the research, paradigm approach and associated methods used to achieve the objectives will ensue.

3.2 Research paradigm

A paradigm is a set of values, beliefs, assumptions and methodologies that guide and inform research within a specific discipline (Ebohon et al., 2021). The foundational framework guides how the researcher's approach, understand and interpret their study. Paradigms represent a worldview that defines the nature of the 'world,' the individual's place in it and the nature of possible relationships to that world (Guba & Lincoln, 1994). Research refers to innovating new knowledge built upon existing knowledge to create novel concepts, understanding and methodologies (Hart & Crawford-Wright, 1999). Most paradigms stem from the two primary research methodologies, positivism

or interpretivism. However, though there are essentially two paradigms, various new paradigms have arisen from these two, including ontology, which answers the question, 'what is the reality? epistemology, which seeks to discover 'how can we know the reality' and methodology, which explains 'how we go about discovering the reality' (Ankersmit, 2021; Maksimovic & Evtimov, 2023). Thus, it is essential to understand each paradigm's unique characteristics and how it aligns with the research study.

This study applies the positivism paradigm as a guideline to explore the reality of nurses' views of what is currently working well and what can be done differently to facilitate the development of a multi-skilled agile perioperative nurse. The reality is achieved by carefully considering individual variables in each research component within the real world. The reality is quantified using a quantitative approach that utilises survey questions to collect data.

The interpretivism paradigm of inquiring implies that numerous realities exist and human behaviours are complex and unpredictable by a predefined probability (Irshaidat, 2022). Thus, findings are generated based on the researcher's and participants' interactions and participation. A vital criticism of the findings from this paradigm is that it is subjective and bias is inevitable; thus, it must be addressed as part of the research. Interpretivism is observed during the qualitative phase of the study, where interviews that include nursing executive managers, operational managers and nurses take place. The interactions generate narratives with rich data and participants' experiences captured by the qualitative research method. Finally, the critical paradigm is based on the values of power balance through engagement with participants to bring about change in their outlook; it enables the balance of dominant ideologies held by those in power within the study (Rehman & Alharthi, 2016).

3.3 Qualitative research

Qualitative research utilises different methodologies with similar comparisons to answer a question when there is little understanding of a phenomena. Qualitative research is descriptive, explanatory and inductive in nature (LoBiondo-Wood et al., 2021). It uses words instead of numbers to give insight and perspectives from those explaining the phenomenon. This is from the individualistic and unique worldview

that influences how each participant translates a question. Thus, researchers believe qualitative studies are socially constructed and context-dependent (Kathryn, 2019). Similarly, they believe the discovery of meaning is the basis of knowledge and, hence, seek to understand the "lived experiences" of the study participants (Aspers & Corte, 2019, p. 45).

This method requires a flexible and direct approach of data collection, enabling the researcher to gain a comprehensive insight into the participant's way of thinking (Land & Harvey, 2021). Qualitative research seeks the truth that constructs credible and dependable research (Cohen & Crabtree, 2008). A qualitative approach to this study allows for views and experiences on what is done well and what could be done differently. This aims to explore the need for a multi-skilled agile nurse in the perioperative department at Waikato Hospital.

3.3.1 Credibility and trustworthiness

Credibility and trustworthiness are essential to the success of mixed method research. Credibility depends on adherence to the principles outlined by data collection and analysis of quantitative and qualitative research methods. The two-pronged approach combines to conclude the study's credibility. The guiding principle determining the reliability of quantitative research is pivoted on the stability of the measuring tools applied. A straightforward process draws on objective data, resulting in objective conclusions when applied appropriately. The same cannot be inferred in qualitative research where random variation potentially influences the consistency of the data collected (Leung, 2015; Stahl & King, 2020). Thus, it is essential to employ strategies and techniques to enhance credibility and trustworthiness. These may include but are not limited to triangulation, member checking, peer debriefing, transferability, peer review, saturation and reflexivity (Nassaji, 2020). Similarly, the researcher, as the data collector and the interpreter of the data, must articulate their world views and acknowledge potential biases that may influence the study (Kurylo, 2016) For trustworthiness, the study must ensure a prescribed process that includes participants involved in either focused groups or interviews comment on the categories and interpretations made.

This study will explore the reliability and validity of both qualitative and quantitative methods. The emerging patterns and themes derived from data observed from interview responses will be utilised to accurately account for the participants' reality. In contrast, reliability and validity will be established from the consistency provided by measure tools employed to draw out objective datasets.

3.4 Quantitative research

Quantitative research collects numerical data for statistical analysis to investigate a research question or hypothesis (LoBiondo-Wood & Haber, 2014). It aims for objectivity and precise control of study findings by quantifying patterns, trends and relationships. Quantitative research utilises a fixed method approach to gather and interpret data and it involves structured surveys, experiments and observations. Large sample sizes are used in quantitative studies to ensure statistical reliability, research rigour and generalisation of findings (Kumar, 2018). It employs a positivist approach based on the philosophical belief system originally developed in natural sciences. It adopts objective, patterned and knowable reality believed to be 'truth', thus, the researcher aim is to support or disapprove assertions (Earl-Babbie, 2013; Leavy, 2017). Positivist research seeks to confirm a hypothesis by uncovering and quantifying relationships between variables through systematic observations and measurements (Zyphur & Pierides, 2020). By controlling the variables, the researcher can eliminate bias and enhance the accuracy and validity of data. This study aims to collect numerical data to explore registered nurses' views on the current configuration of the nursing model within the perioperative department within Waikato Hospital. Specifically, the study will seek to understand what works well and what does not work well. A non-experimental research design will be employed for this study.

3.5 Mixed methods

Mixed methods research combines qualitative and quantitative research approaches to collect and analyse data to acquire a comprehensive understanding of the research question (Johnson et al., 2007). The mixed method approach consists of a complimentary interplay of data achieved through the merging, collecting, building and embedding of data to increase research robustness. The method was selected as it encourages expansion of data search beyond what is yielded by either qualitative or

quantitative (Creswell & Creswell, 2018). Mixed methods approach is essential in this study because it involves a complex setting that involves multi-layered sub-departments all having registered nurses in various nursing levels including those in leadership roles. Thus, it is important to capture individuals' views based on the immediate focus of their current role. For example, the views of the nurses on the floor may be strongly influenced by their personal beliefs and values whereas, those in leadership may be influenced by the organisational needs such as budgetary constraints and organisational goals that may include long term forecast.

Data triangulation is the process of analysing data drawn from multiple sets to reach a conclusion that addresses the research question. Triangulation using descriptive narratives and numerical data is undertaken to increase the relevance and validity of findings. Triangulation will give a better and broader understanding of the research question (Jentoft & Olsen, 2019).

3.6 Researcher background

The researcher is an Associate Charge Nurse Manager in the operating theatre at Waikato Hospital. They hold a Bachelor of Nursing Degree and a Postgraduate Diploma in Health and Social Sciences. Having spent over six years as a Registered nurse in operating theatre, two years as a Nurse educator and currently as an Associate charge nurse manager in the operating theatre, the researcher brings a combination of practical, educational and managerial expertise to the study phenomenon. Through shared experiences and acknowledgement of possible limitations of working in a specialised, often isolated area, the researcher aims to foster open and non-judgemental communication in a secure environment for the study participants. This study aims to improve patient outcomes and enhance the quality of care through the promotion of interprofessional collaboration and professional development for nurses within the perioperative department.

3.7 Methodology, summary

This chapter has provided an overview of the mixed method approach underpinned by theoretical principles of qualitative and quantitative research methods. Applied to explore the feasibility of creating a multi-skilled agile perioperative nurse in Waikato

Hospital. Qualitative methodology is utilised as the primary approach to the study, while quantitative methodology is employed as the secondary methodology.

The study aligns with positivism paradigm perspectives, aiming to derive meaningful responses to explore the research question. Data from the semi-structured interviews provide the preceding data collection method and online self-completing surveys provide secondary data to back themes and narratives observed in the semi- structured interviews. The positivism and interpretivism paradigms within the qualitative inquiry acknowledge the human factors and variables influenced by numerous realities. Thus, data triangulation is critical in integrating several data collection methods necessary to strengthen the results.

Chapter IV: Methods

Research is what I'm doing when I don't know what I am doing.

Wernher von Braun, 1912 – 1977

4.1 Methods, introduction

The research method is a specific procedure extending from the broad philosophical assumptions to data interpretation used to conduct a study (Creswell, 2023). It is a plan in which data collection or generation is clarified. Historically, research methods are categorised as quantitative, qualitative or a combination of the two in mixed methods research (Vaughn & Jacquez, 2020). Determination of the method to undertake varies depending on the nature of data required to answer the research questions. Research methods may include semi-structured interviews and surveys, which are selected as the principal methods to explore the question at hand.

This chapter outlines the process that was undertaken to analyse data from the qualitative and quantitative datasets. It includes a step-by-step process that was employed to explore the creation of a multi-skilled, agile perioperative nurse within Waikato Hospital.

4.2 Study design

The research used a mixed methods approach that involved combining qualitative research focused on acquiring depth of a generated hypotheses with quantitative research that test the hypotheses (Curry & Nunez-Smith, 2014). It employed a consequential exploratory strategy to explore health professional's perspectives on the creation of a multi-skilled perioperative nurse skilled to practice across the department. According to Nieswiadomy and Bailey (2012), sequential exploratory strategy involves the utilisation of quantitative data to test and explore possible generalisation of qualitative data where a phenomenon is poorly understood.

This study was conducted in two phases. Phase I explored qualitative research acquired through semi-structured interviews of (i) Executive management; (ii)

Operational managers; and (iii) Registered nurses. Engaging with staff allows for the successful recognition of identifiable views and integration of literature, allowing for appropriate collaborative response to the reconfiguration of the nursing model. The second phase examined quantitative data obtained through a self-completed survey of up to 250 registered nurses working within the perioperative department. The research design is presented in Figure 1.

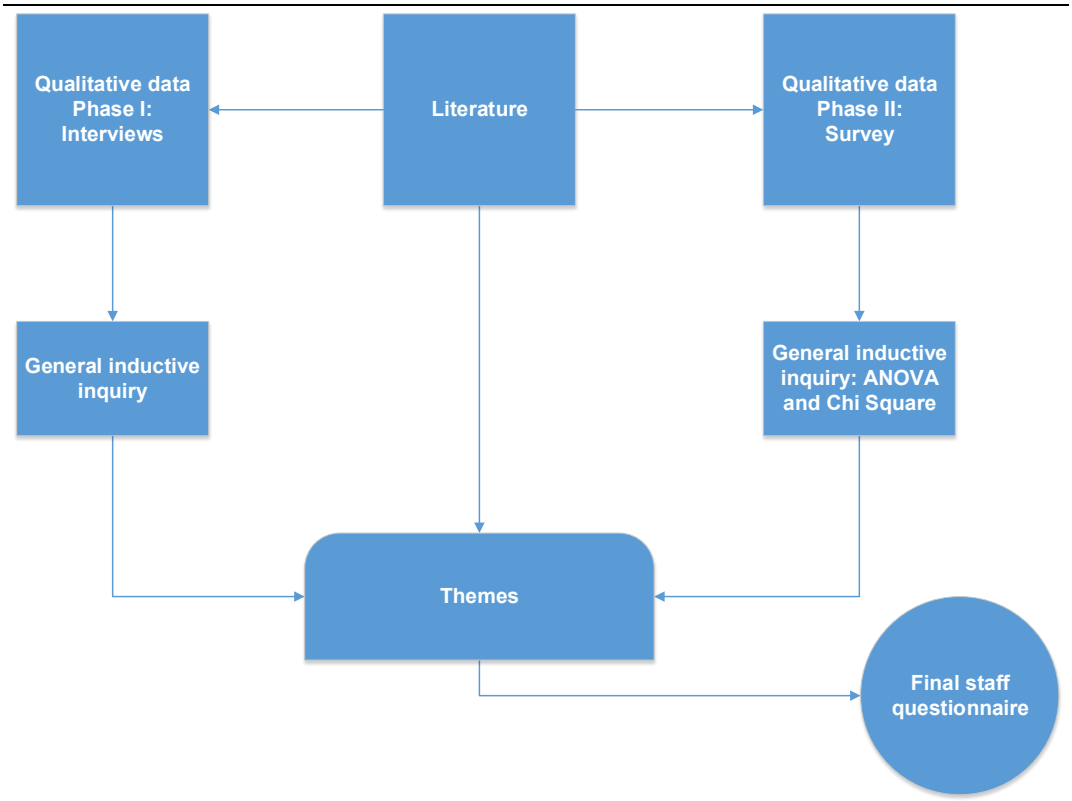


Figure 1: Research design

4.3 Population

Phase I of the research process involved up to 16 health professionals making up the initial focus group. Representation was sought from multiple groups: Nursing executive management (n=4); Operational nursing managers (n=2); Perioperative specialist clinicians (n=3); Senior registered nurses (n=3); Intermediate registered nurses (n=2); and Junior registered nurses (n=2). According to Knechel (2019) sampling in qualitative research is nearly accomplished with small, non-random samples.

The Researcher sought specific groups or individuals with a rich background or experience in the studied area. This enabled the researcher to obtain consistent themes and responses backed by the realistic experiences of the participants. In preparation for focus groups, the researcher initially approached all appropriate stakeholders, inviting them to participate in the study. Following a verbal agreement to participate in the study, the researcher organised a mutually agreed time and location to complete the consent process, including issuing the participant information sheet.

Phase II of the research extended over four weeks. Posters were placed in common areas within the perioperative department, inviting RNs to complete the survey. The posters included brief information on the study's purpose, thus seeking their views on the current nursing configuration, what works well and what does not work well. Posters will also be handed out during handover time. The survey was later emailed to all RNs by an independent administrator. The survey included a participant information sheet and consent that require da tick box approval to proceed.

4.4 Data collection

Data collection starts after defining the research questing and outlining the research design (Mazhar et al., 2021). It is a significant step for research requiring a precise plan utilising authenticated research methods. For this study, the collection of data was divided into two phases. The qualitative information for this research arose from interviews with perioperative nurses, operational managers and executive nursing managers within the study setting. They explored the viewpoints, experiences and opinions of respondents as they relate to the idea of a multi-skilled, flexible perioperative registered nurse, as well as the challenges and benefits of such a workforce model from the context of nursing shortages, as well as growing demands for healthcare. The information gained was examined through a general inductive method, permitting the identification of key themes directly from the evidence from the study participants.

4.4.1 Online survey

Quantitative data was collected through the Qualtrics online survey, which participants accessed via a QR code on a poster advertising the study. Participants were invited to

complete the survey through posters placed in common areas within the perioperative department. The posters included brief information on the study's purpose, seeking their views on the current nursing configuration, what works well and what does not work well. Posters were also distributed during shift change huddles. The survey included a participant information sheet and consent that required a tick box approval to proceed. Additionally, the survey was distributed through email to all perioperative registered nurses by an independent administrator. Using a survey design allows the researcher to quantitatively test associations among the variables of the studied population (Creswell & Creswell, 2018). The quantitative data collection method enabled the acquisition of data needed to validate or refute findings identified in Phase I. It will also provide statistical evidence to support the patterns observed in the qualitative observations (See Table 1, for information on sample).

Table 1: Summary of online survey

Descriptor	Nursing staff	Surveyed
Nurses on the floor	Senior, intermediate and junior Registered Nurses	√
Registered Nurses Anaesthetic Assistants (RNAA)	Senior, intermediate and junior Registered Nurses	√
Clinical Nurse Coordinators	Senior Registered nurses	√
Floor Nurse Coordinators	Senior Registered Nurse	√
Surgical First Assistants (SFA)	Senior Registered Nurses	√
Associate Charge Nurse Managers	Senior Registered Nurses	√
Charge Nurse Managers	Senior Registered Nurses	√
Nurse Managers	Senior Registered Nurses	√
Clinical Nurse Specialist (CNS)	Senior Registered Nurses	√
Specialty Clinical Nurse	Senior Registered Nurses	√

4.5 Analysis

The data collected from the mixed method design was compiled and analysed in alignment with the method that will be obtained. In Phase I this involved using a general inductive method of inquiry to identify and extract themes from the transcribed interview responses. The themes were categorised into general ideas giving the researcher an opportunity to reflect on the general tone, depth and credibility of what the participants will comment. This was later integrated to the themes identified by literature. The data was organised into segments that were assigned non-identifiable codes. The data obtained in Phase II was analysed using ANOVA and Chi Squared.

4.6 Ethical concerns

The research was conducted through the University of Waikato in partnership with Te Whatu Ora Waikato, with data collected from the Waikato Hospital. The study was approved by the University of Waikato Human Research Ethics Committee on 27th of November 2023 with the reference number HREC (Health) 2023#43. Prior to the interviews and completion of the survey, all participants received an information sheet that provided details about the research. The researcher obtained signed consent forms before starting the focus group interview process. For the self-completed surveys, participants were required to tick a box on the consent form as evidence of their participation approval. Participants were unable to proceed with the survey if the consent tick box was not ticked. The survey was anonymous, and participants had the option to withdraw up until the close date of the online live survey after which, the data was downloaded for analysis.

4.7 Methods, summary

The mixed method research design is deemed advantageous as it allows integrating qualitative and quantitative data in a triangulation approach. This mixed method design consists of two phases. During Phase I, stakeholders, including executive managers, operational managers and RNs, were interviewed, and the recordings transcribed verbatim. The interview transcriptions were then coded using a general inductive approach. The themes that emerged from this analysis were combined with

themes from the literature, which were used to develop Phase II of the study. Phase II involved a self-completed survey for RNs.

Chapter V: Findings

Research is formalised curiosity. It is poking and prying with a purpose.

Zora Neale Hurston, 1903 – 1996

5.1 Introduction

This chapter presents the data of the two-phase, mixed-methods study investigating the feasibility of developing a multi-skilled, agile perioperative registered nurse at Health New Zealand Te Whatu Ora Waikato Hospital. The results are structured according to the two phases of the study: qualitative results from the semi-structured interviews and quantitative results from the survey responses.

This chapter aims to systematically present the major themes, patterns and statistical findings arising from the data, creating an unequivocal bridge between the data gathered and the research questions of the study. By combining both qualitative understanding and quantitative data, this chapter seeks to construct an inclusive view of current perioperative nursing practice, the extent to which there is a demand for workplace agility and the possible pitfalls of adopting a multi-skilled model into the perioperative setting.

Part 1: Qualitative findings

5.2 Analysis of qualitative data

Phase I collected qualitative data aimed at establishing themes and patterns of how the nursing model is currently configured, what works well and what does not work well. A qualitative approach was appropriate as it provides material for empirical analysis of a phenomena (Flick, 2018). The data were obtained through semi-structured interviews and collected through audio recording that was later verbatim transcribed. In preparation for the data collection, the researcher approached participants, inviting them to participate; a participant information sheet was provided. Those who agreed to participate in the study met with the researcher who obtained written consent. A semi-structured format of questioning with probes to develop themes was utilised. Interview probes are important to remind the researcher to ask for more information or ask for further explanation of ideas (Creswell, 2023). The Interviews were conducted by the researcher in a quiet, private room and lasted for 30 minutes. A general inductive method of inquiry that identified themes was undertaken.

The qualitative data originated from semi-structured interviews from executive nursing managers, operational managers, perioperative nurses and physicians who work within the study setting. These interviews aimed to enquire into the viewpoints, experiences and opinions of respondents as they relate to the idea of a multi-skilled, flexible perioperative registered nurse, as well as the challenges and benefits of such a workforce model from the context of nursing shortages, as well as growing demands for healthcare. The information gained from the interviews was examined through a general inductive method, permitting the identification of key themes directly from the evidence from the study participants. Some themes emerged relating to the diversity of the perioperative nursing staff and the nursing.

Table 2: Summary of interviews

Descriptor	Nursing staff	Interviews
Nursing executives	Senior Registered nurses	n=4
Nursing operations managers	Senior Registered nurses	n=1
Registered nurses	Senior Registered nurses	n=2
Registered nurses	Intermediate Registered nurses	n=2
Registered nurses	Junior Registered nurses	n=2
Specialist Clinicians	Senior specialist	n=3
TOTAL		n=14

The use of semi-structured interviews enabled the researcher to develop a set of guiding questions to structure the interviews; however, participants were encouraged to freely engage and direct the conversations in the ways they felt was the most relevant to their experiences. This flexible approach allowed for a more detailed and authentic exploration of the subject.

5.3 Themes

Thematic analysis of the interviews concluded over 660 codes, condensed into 16 categories and from this, emerged five themes as illustrated in Figure 2.

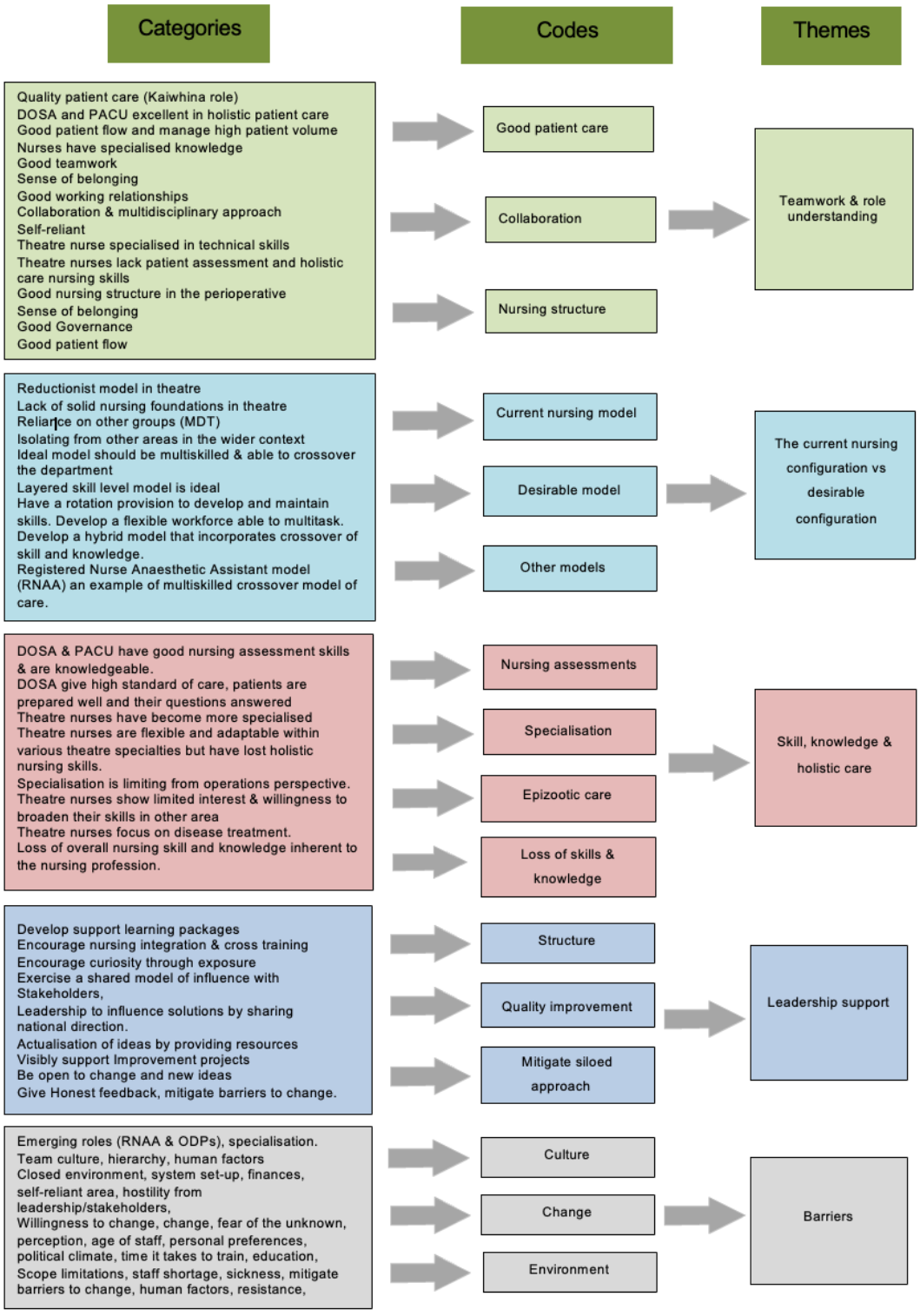


Figure 2: Thematic analysis

5.3.1 Teamwork and role understanding

Teamwork and role understanding emerged as the prominent theme consistently emphasised as a key strength within the perioperative department's practices.

Participants noted that an effective team environment, characterised by well-defined and flexible roles simplifies the working process and enhances both the level of care and patient outcomes.

In addition to clear roles, good communication was repeatedly identified as a crucial component in ensuring that all team members understood their tasks and those of their colleagues. However, the need for greater role flexibility and adaptability among different sub-departments was acknowledged as an ideal approach to foster an effective, multidimensional and dynamic team.

Participants observed that the teamwork among the perioperative nursing staff was well established and embedded in excellent working relationships among multidisciplinary teams. This was identified as a key strength of both the perioperative nurses and the broader health workforce in the department. Participants stated.

> *Periop nurses work well within the MDT, they understand their place and do their job well.*
>
> *Periop nurses have a strong sense of belonging, sense of [teamship].*

Participant A

and

> *Periop uses a multidisciplinary approach…, so probably a strength is the collaboration of different disciplines, especially when preparing patients.*

Participant B

Another participant stated.

> *As a new graduate nurse, I felt well supported by all team members and it made me feel like I belonged. This if different from what I hear from my friends in other areas, apparently staff keep to their own little groups.*

Participant N

On the positive aspect of the perioperative nursing workforce, participants reported a strong commitment to clinical responsibilities and a high level of competence from individual units. PACU and DOSA units were particularly noteworthy, both of which were acknowledged for their excellent practices. These departments exemplified best standards, demonstrating efficiency, exceptional patient care and strict adherence to protocols. The narrative of interviewees revealed that.

> *PACU nurses have excellent nursing skills and deliver high quality care, they do well under limited resources*

Participant D

Similarly,

> *DOSA nurses deliver a high standard of care, patients are prepared well, their questions are answered and their needs met. They also prepare a large volume of patients both from the wards and day surgery cases.*
>
> *Additionally,*
>
> *DOSA nurses understand the rules of engagement and what is expected of them by theatre, whereas some patients coming from the ward, are not very well prepared.*

Participant E

While theatre nurses were observed to lack some aspects of generalised nursing assessment knowledge typically associated with the broader clinical settings, their knowledge was appropriately balanced by their specialised expertise necessary for theatre work. Their in-depth knowledge and skills in delivering surgical care and patient advocacy were recognised as essential in a theatre environment. Participants acknowledged that.

> *Nurses in theatre have specialised knowledge and skills that work well for the patient and delivery of care in theatre… they work in different roles such as a scrub nurse or a scout or as surgical first assistant.*

Participant B

> *…I've seen nurses working in like the surgical care practitioner kind of pathway. There are nurses within this space working at the top of their scope, led by nurses ran by nurses*

Participant A

It was also noted that theatre nurses demonstrated some consistency in the delivery of patient centre care and advocacy. This was achieved through the allocation of a specific nurse assigned to support patient's holistic needs. Also known as "Kaiwhina" their role focused on prioritising comfort and emotion well-being.

> *…allocation of consistent person communicating to the patient and whanau is a good thing…, the patient focused role puts the patient at the centre of care.*

Participant C

While participants recognised the nursing workforce as having specific knowledge necessary in the perioperative setting, the same qualities presented limitations when viewed in the broader context of cross-training a multi-skilled workforce. Theatre nursing was repeatedly singled out as an area where narrow scope and task-focused practices were evident. Creating challenges in the integration and the development of a multi-skilled perioperative nursing workforce. Some of the commentary that contributed to the above summation is noted below.

> *Nurses in theatre have become more and more specialised in specific theatre they work in.*

Participant G

And,

> *Specialised nursing is limiting from a manger's perspective.*
>
> *While theatre nurses offer good care in their specialised areas, they show little interest in the willingness to broaden their skills in other areas. They appear to lack interest in learning other skills because they've never needed to do so, they've always just learned theatre nursing… those nurses don't necessarily want to broaden their own scope and work elsewhere, which for me, although I'm not a theatre nurse, I find that quite frustrating.*

Participant E

A significant risk identified in the current operating theatre nursing model is the emergence of an alternative workforce. A workforce that is not necessarily formally trained in nursing but are trained to undertake operating theatre functions. A cost-effective measure that is sustainable. One participant stated.

> *Technical groups will emerge providing functions as opposed to whole patient experience that acknowledges not only the patient but the family also…, this will be the risk of other groups being trained to do the nursing functions. So the functionality will be just the functions as opposed to the whole patient experience.*

Participant A

Another participant commented on the operating theatre nursing practice.

> *…it's almost like a conveyor belt mentality, actually, they just need to get the patient into theatre, get them through and out.*

Participant B

While there was an indication of the need for role flexibility achieved through cross-training of perioperative nursing functions, some participants expressed potential negative effects of cross-training.

> *When you are constantly alternating jobs, it is difficult to be skilled at one*

Participant B

Specialised skills and knowledge within a team were identified as an important aspect that leads to efficient teamwork and good standards of care. The significance of clearly designated roles in specialised environments, such as the theatre, is critical in reducing errors and improving patient outcomes. One participant stated.

> *…having nurses that have specialised knowledge of what is required for surgical procedures and are experts is necessary to provide good standard of care.*

Participant C

Similarly, it is essential to create an environment that fosters regular collaboration, and space does not hinder team coordination. Addressing physical and organisational challenges is crucial to fostering teamwork, ensuring roles are adaptable and ultimately providing the best care for patients. It was noted,

> *Pre-op is constrained with space*

and

> *…no collaboration with the wider nursing fraternity is happening on a regular basis.*

Participant D

Participant E emphasised the various skills and insights that every team member offers. Recognising and valuing individuals' contributions helps create mutual respect and teamwork. Knowing each other's specialities is essential to creating an effective work environment where each member understands how to work together. Participant E reflected that, it was like,

> *…different specialties working together, each bringing individual uniqueness from the area they've come from.*

Participant E

Nurses within highly skilled areas of theatre and recovery have different skill sets and roles. However, the feedback suggests that increased cross-training would enhance team integration and efficiency in patient care. The consensus among participants is that an agile, cross-trained workforce can ensure an efficient and supportive work environment. However, clear delineation or role responsibilities is essential. This is intended to prevent ambiguity and blurring of clinical accountability.

5.3.2 The current nursing configuration versus the desirable configuration

The second theme that developed from the semi structured interviews was the current nursing configuration versus the desirable configuration. Participants noted that the current configuration is characterised by specialised areas where individuals gain specific competencies necessary for their respective care segments.

The degree of specialisation particularly within the intra-operative phase was identified as a significant barrier to modification of the current configuration and transferability of competencies across the sub-departments. There was a consensus that nursing practice within the perioperative department is highly specialised, with most nurses specialised in one area of practice. According to Adeyoyin et al. (2015), the downside to job specialisation is that people are not trained to multi-task, leading to the loss of critical expertise. The feedback indicated that the perioperative department could benefit from adopting a different format that encourages the utilisation of the nursing workforce through upskilling and resource sharing. On the current nursing model, one participant indicated:

> *The way the current nursing model works, I don't believe it's necessarily the right way. But it's not wrong either, it's just that there can be different ways and I've had nurses in the past who have worked in both theatre and in recovery and the hybrids work really well*
>
> Participant E

Another participant commented on the size of the perioperative nursing configuration by stating,

> *I feel that we've become too big, the department is too big to keep tabs and to manage nursing staff adequately. Gaps in education are no longer easily identifiable, it is*

> *difficult to focus on individual staff, including identifying the potential staff that can be grown to become hybrids or developed into leaders.*

Participant H

Further, it was noted that,

> *…the configuration is misaligned, it favours functionality and meeting KPIs, making it difficult to break down the silos.*

Participant F

And

> *…there is not enough of cross-sectional skill sharing. It would be nice if OT nurses stepped out to help DOSA nurses, especially during the busy start of the day. The cross-over of department would help improve care process and increase efficiencies.*

Participant G

The current nursing configuration is constrained by various factors, with excessive specialisation of roles limiting flexibility and hindering the development of a more integrated model. This view was shared by 60 percent of participants with many claiming that job specialisation may not be flexible enough to cater for the dynamic needs of the department. Participants asserted that,

> *Over specialisation creates regimented silos and that makes it hard for any organisation to change direction on the fly. This is what the current nursing in this department has become.*

Participant H

It was also noted that,

> *When all nurses who used to be generalised nurses become specialised in one area, it's tough to pitch in when priorities shift.*

Participant J

> *Fluidity within the intra-operative areas is not well established.*

Participant C

All participants agreed that a move towards a flexible multi-skilled workforce would reduce some of the pressure generated by staffing deficiencies and the increased volume of patients requiring surgery. All executive and operations managers

interviewed reported that developing a nursing model that can create a pathway for cross-training is ideal. This would enable nurses to work across different areas within the perioperative department. Additionally, 66.6 percent (n=4) of the senior and intermediate registered nurses favoured the same view. There were various suggestions on how to achieve the multi-skilled nursing configuration with key focus on education and training.

> *An ideal model would require more training upfront, it would take time and maybe cost a lot more money, but it would make the nursing workforce more adaptable and better for patient care and experience.*

Participant I

Another participant suggested,

> *Train nursing staff in all the three main areas "DOSA OT and PACU", but when competent, allow staff to practice 80 percent of the time in area of preference.*

Participant D

> *It would be good to have a dedicated nurse educators or clinical coaches to support nurses in new areas especially in their early days of training.*

Participant L

However, the application of such a model would be hindered by various barriers. The participants stated that, the organisation does not have the resources or time to train nurses for many different jobs. This is because there is no financial support for a change like that. One participant suggested

> *While having nurses with diverse skills who can work across multiple areas is valuable, there is no budget to support such progressive initiatives. Ideas like this end up being 'just ideas'…*

Participant H

> *Budgetary constraints may be a problem when it comes to implementation, especially in the current financial climate.*

Participant K

The above remarks highlight the financial and logistical hurdles that would need to be overcome for the successful implementation of the model. The lack of resources was identified by 58 percent of the respondents as a major barrier to the implementation

of the optimal configuration. Although participants support the idea of creating a multi-skilled workforce, a transition to that is needed along with time and money for training schemes. The present format, although specialised, is well established and a transition to flexibility is difficult. One participant commented that,

> *It may be difficult to remove nurses from one area to learn different skills due to the push to get numbers done*
>
> Participant M

Participant E emphasised how areas such as DOSA can enhance patient flow. This observation underscores that there needs to be an overarching strategy where this effectiveness is extended to other areas of the perioperative department. Aimed at facilitating seamless and coordinated care. Such an optimal arrangement would see a cross-functional team streamline patient flow and cut down delays through multi-skilled nurses who rotate through various postings.

> *Theatre to DOSA- if DOSA was struggling with staff shortages, a theatre nurse would pick the patient, prepare them and take them to OT, bypassing the handover stops. This saves time.*
>
> Participant E

The above statement suggests, over time, the use of a multi-skilled, cross-functional model of nursing would translate into greater efficiency throughout the perioperative department. For example, theatre nurses could help with patient preparation and skip the handover step, hence conserving time.

5.2.3 Skills, knowledge and holistic care

Skills and knowledge of the perioperative nursing workforce emerged as a dominant point raised throughout the interview discussions. This was also mentioned across all interviewees regardless of their role. The skills and knowledge of perioperative nurses were discussed in the context of delivering holistic care, with participants eliciting their perspectives of either lack of or having excellent skills and knowledge. Some of the commentary included:

> *DOSA nurses have good assessments skills that help to smooth the process of care. They are the gate keepers who set the scene for the patient experience. Though rushed at times, they have mastered the act of holistic care that then makes the work of theatre nurses easier.*

Participant F

Equally, it was noted that,

> *PACU nurses are highly skilled and knowledgeable in managing high acuity patients, "the technical bits". At the same time, they demonstrate excellent skills in managing the whole patient, including providing comfort and reassurance to the patient and the family, preparing care plans and ensuring discharge plans back to the ward meet the patient's needs. Now, this is what should be expected from all nurses...*

Participant G

Participants suggested that specialisation in a specific area such as operating theatre minimised engagement of nurses working in theatre from fully engaging with the patient journey, an important aspect of holistic care. Interviewees remarked that although those working within the DOSA and PACU units are good at holistic care and assessment of patients, theatre-based workers have become highly specialised in terms of their specific technical knowledge. One participant noted that nurses have become too specialised in one area, they were,

> *…unable to think outside the area they work in…, they have become anxious that they will not know what it is that they should know because they have lost knowledge in other areas. They've become too competent in one area. Now that to me is a very sad indictment of incredibly skilled and knowledgeable nurses who had forgotten what it was to tap into their ability to think critically and to assess a patients.*

Participant A

This is an indicator of concern that excess specialisation within some perioperative functions might lead to inflexibility and a lack of adaptability, especially around holistic approach to care. The shift toward a multi-skilled workforce would bridge these knowledge gaps in skills and patient care. Cross-training had the potential to restore a better-balanced approach to care, this was reported by 58 percent of the respondents. Especially within the operating theatre where holistic nursing has diminished from the interviewee's perspective. Participants stated that a multi-skilled form of staffing would help nurses gain a wider skill base of competencies. This ensuring that holistic care is not compromised with escalating specialisation. The requirement for achieving

a balance demands a shift in the pattern of workforce development and training. This ensures that technical capabilities are preserved along with expanding knowledge of patient care.

5.2.4 Leadership support

The role of the perioperative leadership was identified as pivotal in restructuring the nursing configuration to create a flexible and agile model. A model that supports the integration of skills that facilitate dynamic and fluid capacity, readily transitioning between diverse tasks. Regarding participants perception on how leadership practices contributed to reducing the siloed approach in the current configuration, several insights emerged. Firstly, there was acknowledgment of a good leadership structure with one participant highlighting.

> *Perioperative department has good governance structure, and a good structure of nursing, including in leadership".*
>
> Participant C

> *Leadership has a lot to offer, they can actually break down the barriers of individual thinking about what it is that a nurse should, could and will do in the future. Without nursing leaderships supporting where nurses in the periop space go, they will be replaced.*
>
> Participant A

> *Nursing leadership, such as the nurse director, make a massive difference in the department's direction. They have a broad perspective and insights of what others are doing nationally. These are the people that need to support changes such as this one.*
>
> Participant A

Leadership's role, as a catalyst for determining the direction for workforce development and facilitating a climate for change, was made clear by many of the interviewees. The senior managers explained that leadership is not only about channelling resources but also speaking up for a culture of flexibility and teamwork. One participant noted that for effective change to occur.

> *…you would need senior leadership at the executive level of influence to outwardly be supportive. They need to talk about it with others, say that they have supported the change process and be explicit about why they have supported it. They also need to talk about it and show the benefits of implementing that change.*

Participant E

Further to this,

> *Leadership can support change by assisting to put the change project in front of the people who can help make the difference, afford the facilitator the time to do what they need to do to achieve positive outcomes.*

Participant H

Similarly, leadership plays a critical role in communication the strategic vision of nursing, thereby facilitating integration into practice changes. Participant D suggested

> *Leadership gives direction from national level including the council updates.*

Participant D

However, even with strong support from senior management, there was a concern surrounding the actualisation and the perceived hierarchical resistance within the department. It was suggested that there may be some resistance based on some groups interest including some in positions of influence who may not be on board with the premise of transforming the existing model. It was noted,

> *Some might really want this to fly because they see a hybrid model as being absolutely phenomenal, but others might think no, I've had this small team for quite some time, I don't want anyone to mess with it…*

Participant E

Similarly,

> *People may not want to change due to personal benefits including egos…*

Participant H

Another participant discussed their perception of the surgeon and nurse relationship in theatre as one of subordination. Making it difficult to achieve changes.

> *My interpretation is quite often that surgeons just like to have the same people within their theatre so they can tell what to do.*

Participant A

Additionally, concerns around the fiscal costs and time needed for training were identified as reasons why implementing change would be difficult. This reflects the

conflicting interests and resistance driven by individuals who are operationally efficient and budget conscious. One participant suggested.

> *Budgetary constraints may be a problem*

further to that,

> *…there may not be infrastructure to support the change*

Participant B

Inconsistencies in leadership support and the lack of commitment necessary to support the implementation of meaningful changes were highlighted. One participant discussed the challenges experienced when attempting to support the perioperative nursing workforce from leadership beyond the perioperative department. It was noted that:

> *Environment of theatre nursing is the most difficult nursing environment to get into from a wider leadership perspective.*
>
> *Leadership don't feel welcomed in the perioperative or theatre environment. Leadership input is unwelcome and often met with arms folded and rough looks on the face, saying, we do not need your input; we are just fine.*

Participant A

The necessity for a unified and consensual vision from the leadership is vital to develop a flexible, multi-skilled workforce. Maintaining continuous leadership involvement and creating a culture of trust and collaboration will be crucial for overcoming barriers that were outlined within the interviews. Comments captured in relation to the above idea include:

> *Leadership need to create an environment of sharing knowledge and joint problem solving, influencing collaborative solutions*

Participant E

> *Leaders need to encourage nurses to participate in discussion that affect their work environment and practices.*

Participant G

> *The Periop leaders need to encourage periop nurses to integrate with the wider nursing fraternity, they need to come out and become part of a wider discussion about difference things.*

Participant F

5.2.5: Barriers

Many barriers to the multi-skilled workforce model were highlighted during the interviews. Staff resistance to change influenced by both organisational and individual factors was one of the primary hurdles recognised. The documented culture in the perioperative area presents an equally insurmountable obstacle to transformation. Nurses can resist abandoning tradition, especially when alterations are perceived as violating ingrained conventions. This often leads to resistance in assimilating new models and practice, especially when the present arrangement is viewed as "working well enough." Some of comments that highlighted the department culture as a hinderance include:

> *The ingrained culture of how perioperative department works is a hard one to change.*

Participant A

> *There's egos to protect, their ways of working, their culture, familiarity to what they do. And now they have to do something different?*

Participant E

The wider cultural reluctance to shift from established ways, where there may be some who are apprehensive that change might compromise their professional skill or expertise.

> *People may not want to change due to personal benefits including ego, change of how they've always done things, being comfortable in what they are doing now.*

Participant E

Some comments reflect the multifaceted culture of the decision-making that takes place within healthcare organisations. In was suggested that the decision-making process was excessively hierarchical and encumbered.

> *There's a lot of different people involved in different aspects of decision making.*

Participant C

> *There are some good ideas out here, however, the process of getting them across the line is tedious and nearly impossible due to the layers of approval required. Those ideas end up remaining just as ideas.*

Participant H

Change was highlighted as a barrier. Resistance to change is frequently caused by personal comfort and fear of losing perceived advantages in the current modus operandi. Individuals may have invested significantly in the current methods because of past achievement or personal identity with present roles. A number of participants expressed that the staff might resist change, especially those who are used to their expert roles.

> *Staff may not like change as it would mean learning new ways.*

Participant C

> *There may be push back from current staff allocated in particular areas. They may not want to train people who will be moving around regularly.*

Participant G

> *So there will be a group of people who will not want to change and it's just part of change that, for no particular reason, some may not be interested with the unknown.*

Participant E

Change can bring about fear and anxiety and illustrated by one participant.

> *Nurses may worry that they are not good learners and may been seen as not being good enough by peers, stigmatised and judged.*

Out of the total interviewees, 47 percent were of the opinion that some of the staff members would find that change was not necessary or is too difficult to achieve.

> *It may not be something that some people are passionate about or actually don't believe it's for everyone. Some wouldn't be safe, to be honest.*

Participant D

Over half (58%) of the nurses concurred that resistance to change was a major concern, particularly those who are older or those who are near retirement. Which speaks to the generation gap that is a source of resistance to new models.

> *The older nurses who are near the end of their careers may not see the point of change,*
>
> Participant D

Organisational and environmental constraints were other areas highlighted as potential barriers to establishing a multi-skilled flexible perioperative nursing model. Participants indicated that the lack of resources needed to implement and sustain the change is the real barrier to the envisioned multi-skilled workforce. A major hindrance is budget limitations.

> *Budgetary constraints may be a problem.*
>
> Participant B

> *Implementing a model like this would take time which means the loss of productivity at least during the initial training period. I do not see how the organisation can fund this, there is simply no money.*
>
> Participant H

It illustrates that the funds necessary to fund cross-training and the creation of a multi-skilled workforce are not always there. This was affirmed 56 percent of participants who noted that, without proper funding for training programmes, the implementation of a flexible workforce was not possible.

Participants discussed various operational barriers related to both staff and the organization. These barriers significantly hinder the effective implementation of the multi-skilled perioperative nursing model during its early stages.

> *Another barrier would be sickness, if you've got that model and staff call in sick, what do you do? In this instances, there will be an expectation to postpone training to provide care services to patients.*
>
> Participant E

> *Barriers posed by nursing hierarchies and perceptions of risk must be identified. If this is not done well by an appropriate person with influence, the whole idea will collapse.*
>
> Participant B

Another participant suggested the push on improving theatre efficiency may create a barrier to successful creation a multi-skilled perioperative model. This is closely related

to the organisational requirements and mission to meet the surgery targets. The participant stated:

> *The current pollical climate may not allow the removal of nurses from an area to learn different skills. This is due to the push to get numbers done.*
>
> Participant N

Part 2: Quantitative findings

The 23-questions survey investigated three main areas (See Appendix 3), including: Nurses' demographic information; The nurses' role in the perioperative department; and Current configuration versus a multi-skilled nursing model.

The survey aimed to gather nurses' opinions about the current nursing configuration in the perioperative department. It also aimed to identify what works well in the current configuration and what does not. Other areas of interest included the nurse's interest cross-training and the development of a multi-skilled perioperative nursing model. The discussion will present the quantitative findings, including statistically significant results for each identified demographic.

5.3 Survey sample characteristics

The quantitative component of the study was centred on the demographic and clinical features of the respondents, as was fundamental to the comprehension of the population of interest. The survey was sent to 250 nurses, and 88 responses were received (a 35% response rate). The sample composition was predominantly female, accounting for 83 percent of the respondents. Most respondents were 25 to 44 years old, representing a total of 63.7 percent of the sample. A total of 38.6 percent of the respondents had a qualification higher than a Bachelor of Nursing. Respondents had a varied experience, with most having an experience range of 5 to 15 years (76.2%). DOSA, OT, IR and PACU were the most represented departments with figures of 14.9 percent, 52.3 percent, 9.1 percent and 6.8 percent respectively. The varied experience and departmental representation provide a balanced view of the impact the proposed model of multi-skilled nurses. Results are presented in Table 3.

Table 3: Sample characteristics

Characteristic	Count	%	Cumulative %
AGE			
Age 18-24	8	9.1	9.1
Age 25-34	29	33.0	42.0
Age 35-44	27	30.7	72.7
Age 45-54	11	12.5	85.2
Age 55-64	9	10.2	95.5
Age 65+	4	4.5	100.0
Total	88	100	100
GENDER			
Gender: Female	73	83.0	83.0
Gender Male	15	17.0	17.0
Total	88	100.0	100.0
DEPARTMENT			
DOSA	13	14.8	14.9
OT	46	52.3	67.2
PACU	6	6.8	74
Other	22	25	99
Missing	1	1.1	100
Total	88	100	100
QUALIFICATION			
Bachelor of Nursing	54	61.4	61.4
Postgraduate certificate (PGCert)	15	17.0	78.4
Postgraduate Diploma (PGDip)	12	13.6	92.0
Masters (e.g., MA, MSc, MBA)	7	8.0	100.0
Total	88	100	100
EXPERIENCE			
Less than one year (NETP)	5	5.7	5.7
1-5 years	16	18.2	23.9
6-10 years	18	20.5	44.4
10 + years	48	54.5	98.9
Missing	1	1.1	100
Total	88	100	100

Table 3 presents a general overview of the demographic and professional composition of the sample population covered by the study. The distribution includes essential information such as age; gender; department; qualification and experience of the respondents. The makeup of the sample is of interest in placing the study's findings in context, given the diversity of experiences, backgrounds and qualifications among the nurses in the perioperative department.

5.4 Exploring the relationships statistically

In statistical analysis, relationship dependency refers to the extent to which the value of one variable is influenced by the value of another. A variable is any characteristic that can be measured or counted. The strength and validity of statistical relations are dependent on the careful selection of appropriate variables. Choosing variables that are thematically relevant to the study ensures that the analysis aligns with the research question and objectives. Thus, providing a meaningful contribution to the area of research. The themes derived from the thematic analysis served as the basis for the development of the survey questionnaire. The questions were structured around the five key themes, including: teamwork and role understanding; the current nursing configuration compared with the desired configuration; transitioning to an integrated approach (sharing of skills, knowledge and holistic care); leadership support; the department's culture; and barriers to implementing the multi-skilled model.

5.4.1 Collaboration, skill sharing and workload

Figure 3 indicates that a total 52 of the 87 respondents (59.8%) agreed that collaboration across the department was excellent. Almost a quarter (24.1%) 21 of the 87 (24.1%) were neutral and 14 of the 87 (16.1%) respondents reported that they disagree that the teamwork across the departments was excellent.

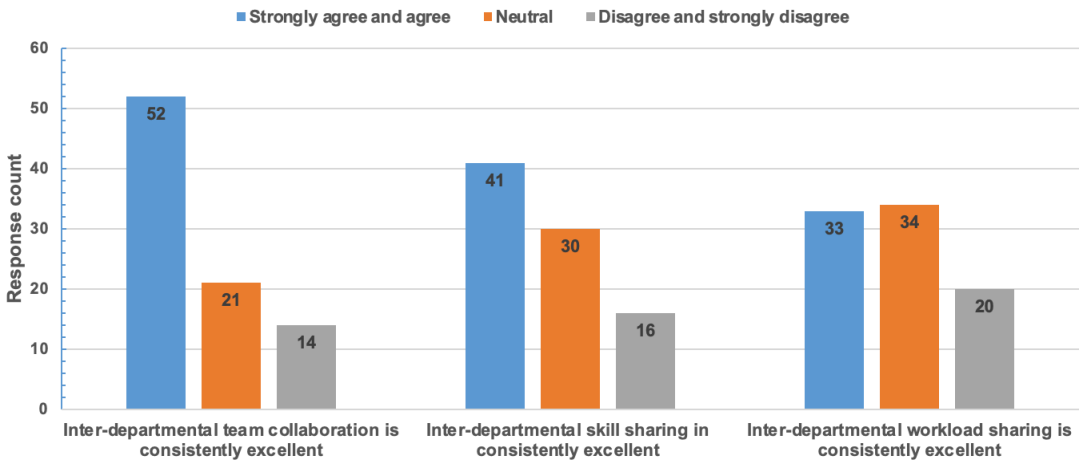


Figure 3: Views of nurse in relation to collaboration, skill sharing and workload sharing

The relationship was explored statistically using Chi Squared and the results presented in Table 4 (collaboration), Table 5 (skill sharing) and Table 6 (workload).

Table 4: Chi-Square Tests, relationship between collaboration and level of agreement

Test	Value	Significance (2-sided)
Pearson Chi-Square	4.883[a]	0.299
Likelihood Ratio	4.624	0.328
Linear-by-Linear Association	1.518	0.218
N of Valid Cases	87	

a. 5 cells (55.6%) have expected count less than 5. The minimum expected count is .97.

The analysis indicates that there was no statistically significant difference between the responses, at the five percent level, between: collaboration and agreement level (p-value=0.299).

Table 5 explores the relationship between skill-sharing and level of agreement. Almost half, (41 of the 87 respondents, 47.1%) agreed that skill-sharing across the department was consistently excellent. Of the respondents, 30 of the 87 (34.5%) were neutral when asked if they believed that skill-sharing across the department was consistently excellent and 16 of the 87 (18.4%) respondents reported that they disagree that the skill-sharing across the department was consistently excellent.

Table 5: Chi-Square Tests, relationship between inter-departmental skill sharing and level of agreement

Test	Value	Significance (2-sided)
Pearson Chi-Square	6.096[a]	0.192
Likelihood Ratio	6.058	0.195
Linear-by-Linear Association	3.273	0.070
N of Valid Cases	87	

a. 4 cells (44.4%) have expected count less than 5. The minimum expected count is 1.10.

Although Figure 3 shows that there was a difference in the responses, the difference was not statistically different at the five percent level, using Chi-squared (P=0.192).

Table 6 explores the level of agreement with inter-departmental workload sharing. A total of 33 of the 87 respondents (37.9%) agreed that interdepartmental workload-sharing across the department was consistently excellent. Of the 87 respondents, 34

(39.1%) were neutral when asked if they believed that interdepartmental workload-sharing across the department was consistently excellent and 20 of the 87 (23%) respondents reported that they disagreed that the interdepartmental workload-sharing across the department was consistently excellent.

Table 6: Chi-Square Tests, relationship between workload sharing and level of agreement

Test	Value	Significance (2-sided)
Pearson Chi-Square	6.340[a]	0.175
Likelihood Ratio	6.303	0.178
Linear-by-Linear Association	3.777	0.052
N of Valid Cases	87	

4 cells (44.4%) have expected count less than 5. The minimum expected count is 1.38.

The analysis indicated that there was not a statically significant difference between responses at the five percent level (P=0.175).

5.4.2 Perioperative department configuration

The staff perception of the department configuration can be a valuable indicator of areas in need of improvement, particularly concerning the adoption of a new collaborative model that supports holistic care. An ideal configuration can facilitate effective teamwork and ensure that roles, responsibilities and workflow align with the department's needs. The staff's perception of the effectiveness of the department based on how it is configured can vary based on several factors, including the level of individual qualification and their current role within the department. These two factors were explored further in the analysis. Figure 4 shows the views of nurses around the question "I believe that the way in which the department is organised into five sub-departments is the best way to deliver holistic high-quality care to our patients", by qualification.

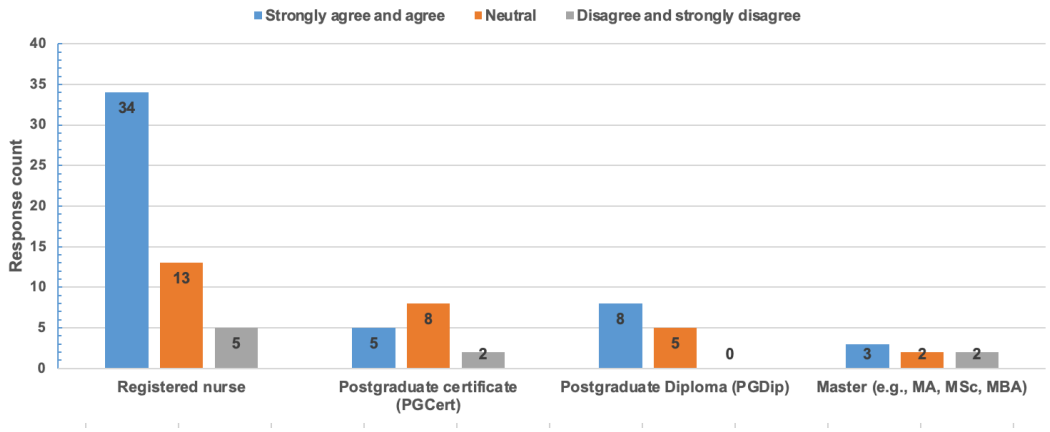


Figure 4: Views of RNs in relation to the current configuration, by qualification

For this study, qualifications were based on RNs with no postgraduate qualification; RNs with a postgraduate certificate (PGCert); RNs with a postgraduate diploma (PGDip); and nurses with a master's or higher qualification (MA, MSc, MBA). Figure 4 indicates that 34 of the 52 respondents with no postgraduate qualification (65.3%) believed that the way in which the department is currently configured is the best way to deliver holistic care, 13 of the 52 (25%) were neutral and five of the 52 (9.6%) reported that they disagreed with the statement. A third (33%) of RNs with PGCerts believed that the current department configuration is the best way to deliver holistic care. Eight of 15 (53%) were neutral and; two of the total number of 15 (13.3%) disagreed with the statement. Eight of the 13 RNs with a PGDip (61%) believed that the current department configuration is the best way to deliver holistic care. Five (33%) were neutral and none of the RNs with a postgraduate diploma disagreed with the statement. Three (42.8%) RNs with master's qualifications or higher believed that the current department configuration is the best way to deliver holistic care. Two (28.5%) were neutral and; two (28.5%) disagreed. The data were explored statistically, with the results presented in Table 7.

Table 7: Chi-Square Tests, relationship between current configuration and level of agreement, by qualification

Test	Value	Significance (2-sided)
Pearson Chi-Square	9.832[a]	0.364
Likelihood Ratio	10.579	0.306
Linear-by-Linear Association	1.427	0.232
N of Valid Cases	87	

a. 11 cells (68.8%) have expected count less than 5. The minimum expected count is .08.

The analysis revealed that there were no statistically significant differences at the five percent level, between the groups, by qualification. The perception of the configuration was further explored through the perspectives of RNs on different levels of nursing roles, particularly those working on the floor and those in management roles. This dual-lens approach enabled a comparative understanding of how positional context influences the perception of the current configuration and the need for change. The outcome of this analysis is illustrated in Figure 5.

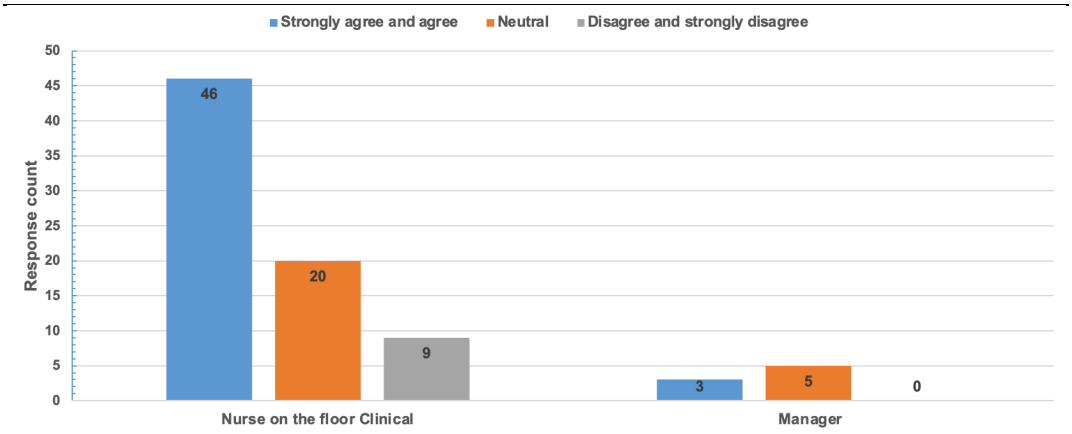


Figure 5: Views of RNs in relation to the current configuration, by level

The results were explored statistically, through Chi-squared and the results are presented in Table 8.

Table 8: Chi-Square Tests, relationship between current configuration and level of agreement, by level of nursing

Test	Value	Significance (2-sided)
Pearson Chi-Square	5.399[a]	0.494
Likelihood Ratio	5.960	0.428
Linear-by-Linear Association	0.214	0.644
N of Valid Cases	86	

a. 9 cells (75.0%) have expected count less than 5. The minimum expected count is .02.

There was no statistically significant difference between configuration and level of RNs (P value =0.494) at the five percent level. Most RNs believed that the current way the department is configured into five sub-departments is the best way to deliver holistic high-quality care to patients.

5.4.3 Integrated department

Question 21 of the survey related to how RNs "…believe that the structure of the department needs to change to a more integrated approach that facilitate the development of a multi skilled nursing workforce". Figure 6 illustrates the results.

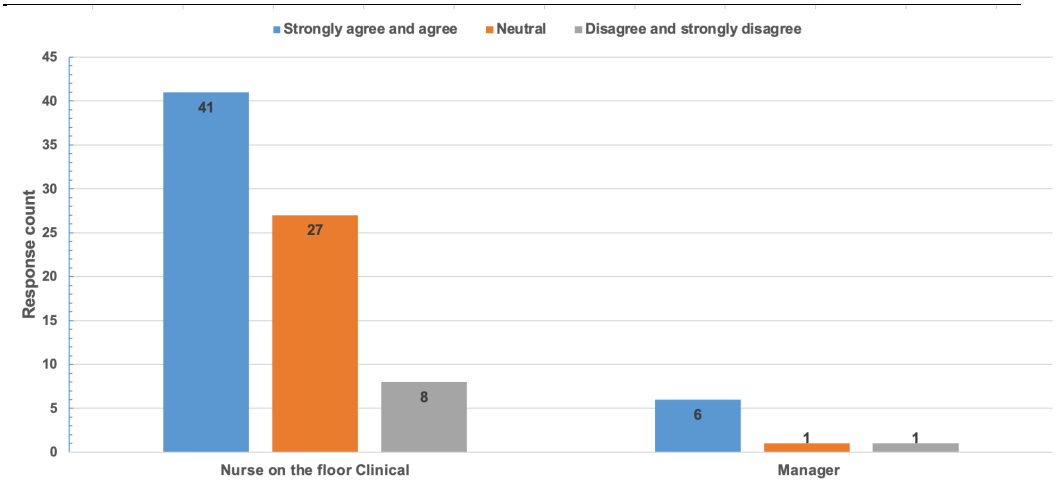


Figure 6: RN perceptions on integrated approach, by role

The plot illustrates that 26 of the 53 respondents with no postgraduate qualification (49%) believed that the way the department is currently configured is the best way to deliver holistic care, 23 of the 53 (43.4%) were neutral and four (7.5%) respondents reported that they disagreed with the statement. A total of 11 (73.3%) RNs with postgraduate certificates believed that the current department configuration is the best way to deliver holistic care. Two (13.3%) were neutral and; two (13.3%) disagreed with the statement. Seven of the 12 RNs with a postgraduate diploma (58.3%) believed that the current department configuration is the best way to deliver holistic care. Three (25%) were neutral and two (16.6%) disagreed. Six of the total number of seven (85.7%) RNs with a master's qualification or higher believed that the current department configuration is the best way to deliver holistic care, none were neutral, and one disagreed with the statement. The results were explored statistically and presented in Table 9.

Table 9: Chi-Square Tests, relationship between current configuration and level of agreement, by level of nursing

Test	Value	Significance (2-sided)
Pearson Chi-Square	3.315[a]	0.507
Likelihood Ratio	4.314	0.365
Linear-by-Linear Association	0.010	0.921
N of Valid Cases	86	

a. 6 cells (66.7%) have expected count less than 5. The minimum expected count is .21.

The results indicated that there was no statistically significant difference between agreement and level of nursing at the five percent level of significance (p=0.507).

5.4.4 Learning and development opportunities

Question 22 investigated the nurses' interest in pursuing learning and development opportunities in different areas from their current allocation and specifically related to the question, "I would be interested in pursuing learning and development opportunities in different areas from which I am currently working within." Professional development was selected as an important dependent variable because strong positive interest would potentially indicate the staff's willingness to expand their skills and knowledge. The results, by qualification are presented in Figure 7.

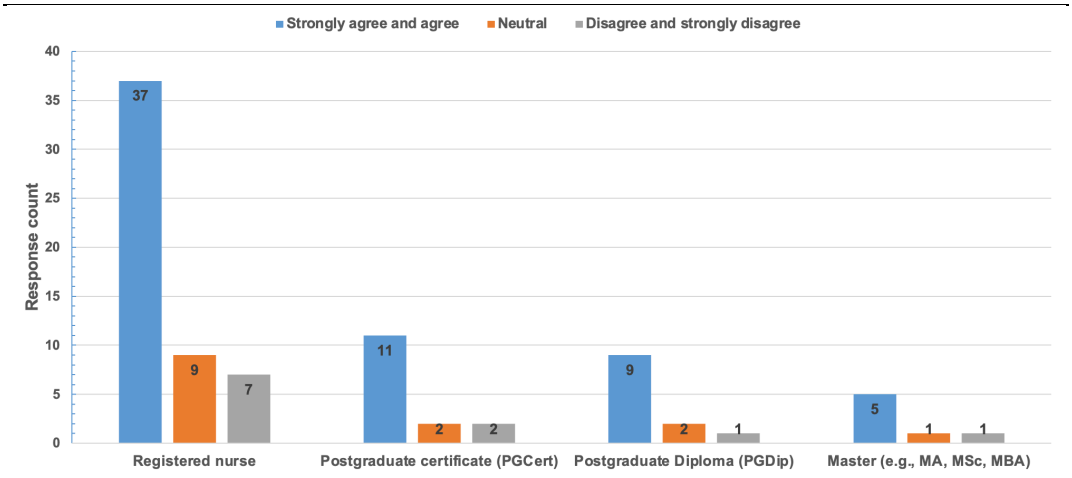


Figure 7: RN interest in professional development, by qualification.

Figure 8 indicates that 37 of the 53 respondents with no postgraduate qualification (69.8%) indicated that they would be interested in pursuing professional development in other areas. Nine (16.9%) were neutral and seven (13.2%) respondents reported that they were not interested in pursuing professional development. Of the total

number of 15 RNs with postgraduate certificates (73.3 per cent), 11 indicated that they would be interested in pursuing professional development in other areas, two (13.3%) were neutral and two (13.3%) disagreed with the statement. Nine of the 12 RNs with a postgraduate diploma (75%) indicated that they would be interested in pursuing professional development in other areas. Two (16.6%) were neutral and one (8.3%) with a postgraduate diploma disagreed with the statement. Five of the total number of seven (71.4%) RNs with a master's qualification or higher indicated that they would be interested in pursuing professional development in other areas. One (14.2%) was neutral and one (14.2%) disagreed with the statement.

Alongside qualifications, level of experience or role was explored. Figure 8 indicates that, 53 of the 75 respondents who are RNs on the floor (70.6%) indicated that they would be interested in pursuing professional development in other areas. A total of 13 (17.3%) were neutral and nine (12%) respondents reported that they disagreed with the statement. Six of the total number of eight (75%) managers indicated that they would be interested in pursuing professional development in other areas and two (25%) disagreed with the statement.

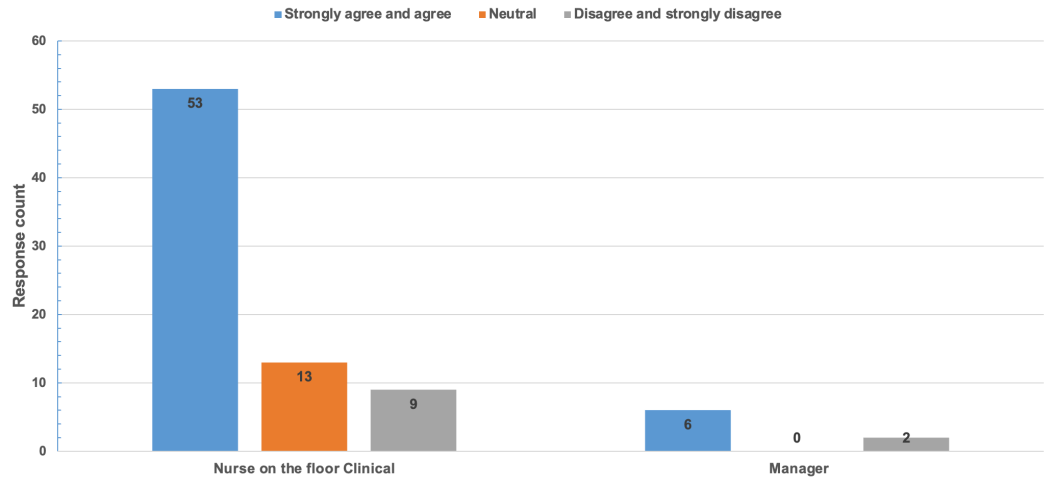


Figure 8: RN perceptions by role

An ANOVA was used to explore the relationship between Qualifications and Role by willingness to pursue further education and the results are explored in Table 10.

Table 10: ANOVA, Willingness to pursue education in other areas

Source	Sum of squares	Mean square	Significance (P value)
Corrected Model	3.68	0.460	0.519
Intercept	30.545	30.545	<.001
@5_Quals	1.303	0.434	0.470
@9_Role	0.024	0.012	0.977
@5_Quals * @9_Role	3.363	1.121	0.095
Error	39.250	0.510	
Total	216.000		
Corrected Total	42.930		

The ANOVA results (in as shown in Table 10) indicate that neither qualification nor role had a statistically significant impact on nurses' interest in professional development, P =0.470 and P=0.977, for qualifications and roles respectively. Overall, most nurses (70.5%) indicated a strong interest in pursuing professional development across various areas, making this the strongest response among the survey questions. Approximately 15.9 percent of nurses were neutral or uncertain about their interest, while only 12.5 percent disagreed or expressed no interest in further professional development, though no differences were statistically significant.

5.4.5 Leadership

Leadership plays a critical role in implementing change, particularly in complex health care settings like Waikato Hospital's perioperative department. Strong leadership is essential for communicating a clear vision and encouraging staff to engage in the proposed changes. This theme emerges from a thematic analysis, thus highlighting an important factor that can influence the development of the multi-skilled perioperative nursing workforce. In contrast, perceived weakness and poor leadership can create resistance, reduce morale and hinder progress, even when structural supports for change are in place. Ultimately, both the effectiveness and perception of leadership significantly influenced the success of workforce transformation initiatives. To explore this theme further, question 23 aimed to establish whether RNs believed "…strong leadership can help reduce a siloed approach to working within a perioperative department" The results are presented in Figure 9.

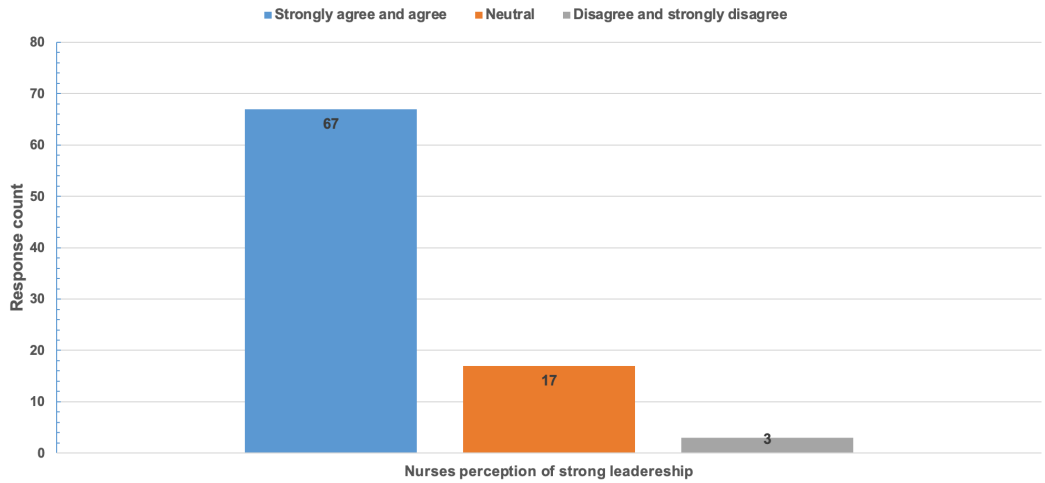


Figure 9: RN perception of strong leadership to reduce silos

From a total of 87 participants, 67 (76.1%) indicated that they believed strong leadership within the perioperative department can help mitigate the current siloed approach to working. A smaller proportion of 17 participants (19.3%) remained neutral on the statement, and only three nurses (3.4%) disagreed or felt leadership was unable to reduce the siloed approach to working within the perioperative department. These findings provide quantitative support for the qualitative theme, emphasising that leadership support is vital for workforce stability and change management. Strong leadership is therefore a critical component to implementing workforce changes such as the multi-skilled nursing model, underscoring its importance in guiding staff through transitions.

5.4.6 Culture

The culture of the department emerged as a theme in the thematic analysis, requiring further development in the context of change implementation. The culture of a department plays a critical role in the success or failure of transformation efforts. A positive departmental culture, as perceived by staff, can increase staff engagement with change initiatives. In contrast, a negative culture can serve as a barrier that ultimately undermines compliance, thus impeding progress. Culture plays a prominent role in the literature as a factor influencing the implementation of meaningful and sustainable change. This is presented in different multidimensional aspects, such as workplace culture, staff culture and organisational culture, to name a few. Thus, addressing the theme of culture is essential in efforts to develop a multi-skilled perioperative nursing workforce.

Understanding staff perceptions of the existing culture provides valuable insight into how the proposed changes, including cross-training and multi-skilling, may be accepted. Question 25 (see Appendix 3) explores RN perception of whether the existing culture within the perioperative department acts as a barrier to change. This question aimed to explore how the deep-seated attitudes and behaviours within the department may hinder efforts to implement change.

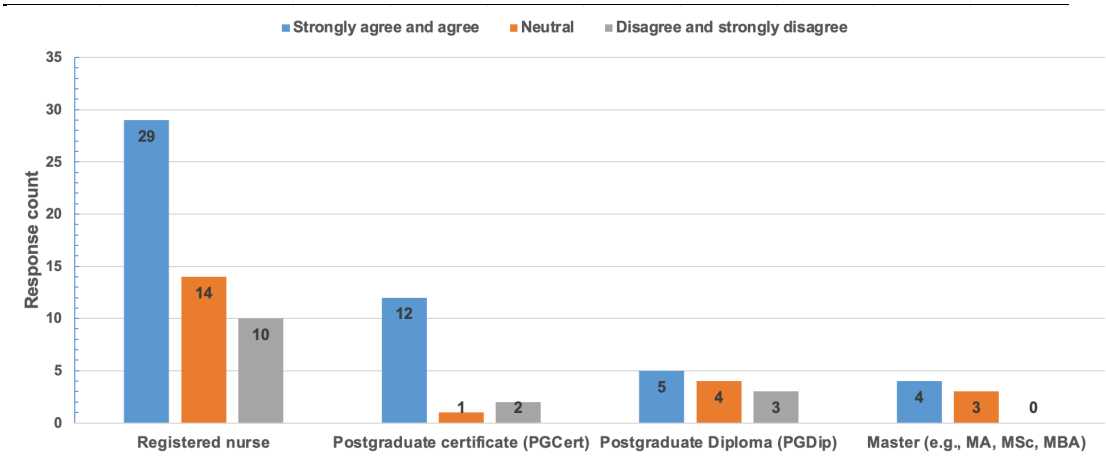


Figure 10: RN perceptions on department's culture measured, by qualification

Figure 10 reveals that 29 of the 53 respondents with no postgraduate qualification (54.7%) perceived that the culture of the department gets in the way for change for the better, 14 (26.4%) their perception of culture as a barrier to change and 10 (18.8%) respondents reported that they disagreed with the statement. A total of 12 of the total number of 15 (80%) RNs with postgraduate certificates perceived that the department's culture gets in the way of change for the better, one (6.7 per cent) was neutral, and two out of the total number of 15 (13.3%) disagreed with the statement. Five of the 12 RNs with a postgraduate diploma (41.7%) perceived that the department's culture gets in the way of change for the better. Four (33.3%) were neutral and three (25%) disagreed with the statement. Four of the total number of seven (57.1%) RNs with master's qualifications or higher perceived that the department's culture gets in the way of change for the better, three (42.9%) were neutral and no participant disagreed with the statement.

Nursing role was also explored and the results are presented in Figure 11.

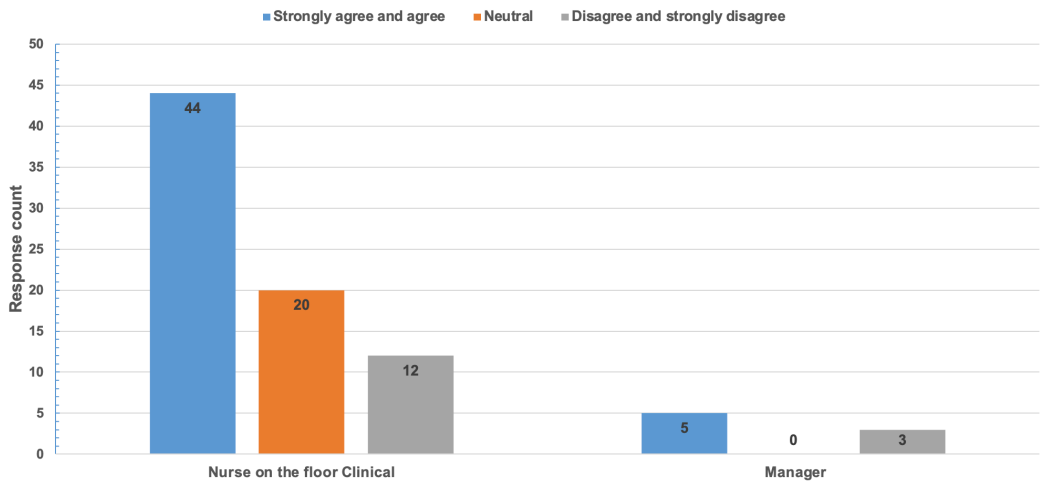


Figure 11: RN perceptions on department's culture, by role

The figure illustrates that 44 of the 76 respondents who are nurses on the floor (57.9%) believed that the culture of the department gets in the way of any change for better. Over a quarter n=20 (26.3%) viewed culture as a barrier to change and; 12 (15.8%) respondents reported that they disagreed with the statement. Five out of the total number of eight (62.5%) believed that the culture of the department gets in the way of any change for better, none (0%) were of a neutral opinion and three (37.5%) disagreed with the statement. The relationship with qualifications and roles was explored through ANOVA and the results presented in Table 11.

Table 11: ANOVA, Willingness to pursue education in other areas

Source	Sum of squares	Mean square	Significance (P value)
Corrected Model	2.845a	0.356	0.356
Intercept	40.325	40.325	40.325
@5_Quals	1.885	0.628	0.628
@9_Role	0.436	0.218	0.218
@5_Quals * @9_Role	0.158	0.053	0.053
Error	47.910	0.622	0.622
Total	269.000		
Corrected Total	50.756		

a. R Squared =.056 (Adjusted R Squared =0.042)

The analysis indicated a near statistical relationship between 'Qualifications' and 'Role' in willingness to pursue education in other areas.

5.4.7 Barriers to implementing the multi-skilled model

Identifying barriers to change from the perspective of those most directly affected, including the nurses working on the floor, is critical to the success of any change initiative. Nurses who manage patients in their day-to-day role possess valuable, experience-based insights into the practical challenges that may hinder implementation efforts. Therefore, it is essential to recognise these barriers in order to understand the current climate, and this is necessary to inform proactive mitigating strategies. To further understand the extent of the most pressing barriers to change, a theme that emerged from thematic analysis, the survey requested participants to rank seven potential barriers to change in order of perceived impact, as captured in question 26 (see Appendix 3). The results, illustrated below as percentages, provide an indication of which obstacles are considered most significant by the nurses on workforce. This information is vital for the development of targeted educational programmes and support mechanisms. The information ensures that initiatives such as cross-training are grounded in a realistic understanding of the concerns of the nurses on the floor.

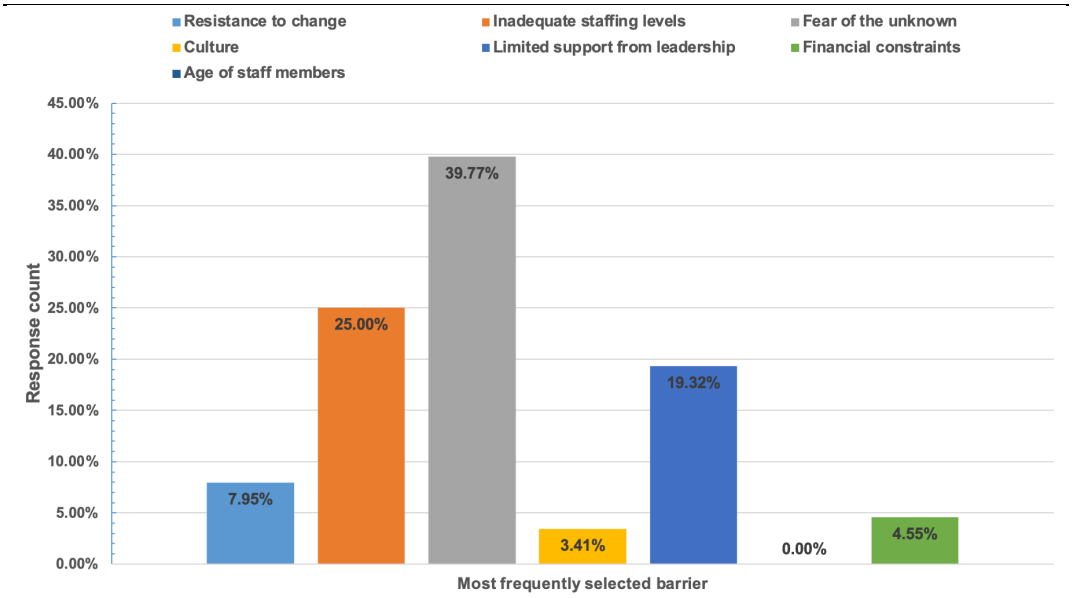


Figure 12: Illustration of barriers to multi-skilled workforce implementation

As indicated in Figure 13, the fear of the unknown was the most frequently selected option, accounting for 39.77 percent. However, despite its overall popularity, it ranked as the second most common first choice among respondents, with a 29 percent selection rate. Inadequate staffing levels are a significant barrier to developing an

integrated model. This was reflected in the data, where inadequate staffing levels emerged as the leading first-choice at (31percent) selection among respondents. However, it was the second most frequently selected option overall, with a 28 percent selection rate. This indicates its critical importance, particularly as an initial concern. Another barrier identified was the limited support from leadership. This was the third most selected option, at 19.32 percent. However, it was ranked lower at five percent as the first choice in the order of concerns for nurses. Resistance to change, at 7.9 percent, financial constraints, at 4.44 percent, and culture at 3.41 percent, were ranked in third, fourth and fifth positions, respectively. The age of nurses was not highlighted as a barrier to change.

5.7 Quantitative findings, summary

The quantitative data from this research paints a complex and somewhat ambivalent picture of the attitudes towards the proposed multi-skilled perioperative model among nurses. Overall, there was support for concepts such as flexibility, collaboration and sharing of skills; however, the data indicate no clear support for, nor any decisive opposition to, an out-and-out transformation of the workforce into a multi-skilled model. Such lack of decisive impact is an interesting finding and should be subjected to interpretative critique. Interestingly, when the nurses were asked whether the existing composition should be changed to a more integrated approach, 53.9 of nurses who worked in the frontline indicated that the way the department is currently configured is the best way to deliver holistic care. Only 10.5 percent of respondents indicated a need for change. The findings appear to be contradictory to the results, which indicate a high level of interest in professional development. An outcome commonly associated with cross-training, collaboration and the implementation of an integrated approach. In addition, inferential statistical tests, such as ANOVA and chi-square analyses, revealed no significant association between important variables, including collaboration, share of skills, qualifications, department culture and retention and workforce preference. This indicates that while attitudes towards constructs such as flexibility and working in teams are positive, these do not actually translate into a commitment or eagerness on the part of nurses to embrace the new form of workforce composition. This lack of enthusiasm could be the result of several underlying dynamics.

Chapter VI: Discussion

"Research means that you don't know, but are willing to find out."

Charles F. Kettering, 1876 – 1958

6.1 Introduction

This chapter explores the findings from this mixed-methods research, interpreting the results within the context of the current literature, the research questions, and the broader context of perioperative nursing in Aotearoa-NZ and around the globe. The conclusions are examined critically to consider the extent to which they support, extend, or contradict the current understanding of developing a multi-skilled perioperative nursing model. Specific consideration is given to the factors that determine workplace agility, the impediments to cross-training and adaptability, the implications for practice, and patient outcomes. The research aims to provide an understanding of the perioperative nursing ability to adapt to the changing needs of contemporary healthcare. The central questions which guided the study included the following.

1. What are the views of registered nurses, operational managers and executive nursing managers in relation to how nursing is currently configured within in the perioperative departments at Waikato Hospital.

2. What are the views of registered nurses, operational managers and executive nursing managers in relation to what works well within the perioperative departments at Waikato Hospital.

3. What are the views of registered nurses, operational managers and executive nursing managers in relation to what does not work well within in the perioperative departments at Waikato Hospital.

Part 1: Research questions

This section addresses the key research questions that guided the study. These questions examined the nurse's and key stakeholder's understanding of the current perioperative nursing configuration. The questions also examined the appetite for creating a multi-skilled, flexible, and agile registered nurse model within the department. The data was collected in two phases. Phase one involved the collection of qualitative data through semi-structured interviews with registered nurses, executive nursing managers, and senior clinicians. Phase two included the gathering of quantitative data through an online survey of all registered nurses working in the perioperative department.

6.2 What are the views of registered nurses, operational managers and executive nursing managers on how nursing is currently configured within in the perioperative departments at Waikato Hospital?

The recurring view across the interviews indicated that the current nursing configuration within the perioperative departments at Waikato Hospital is highly specialised. It is characterised by distinct nursing roles that divide and isolate nurses to specific areas of work. This results from the need for specific skill relevant to the stage of care along the perioperative care continuum. The role specificity likely promoting inadvertent role specialisation, a common practice identified in the perioperative department. While role specialisation provides nurses with the specialised knowledge required to undertake special duties, including assisting in surgical procedures or close monitoring of unconscious patients (Ahmed, 2019b; George et al., 2019); it leads to separation of the wider nursing workforce within the department leading to isolation and division of labour.

The separation limits the opportunities for role integration resulting in reduced opportunities for developing shared competencies applicable across different areas within the department. The fragmentation contributes to the emergence of silos that hinder collaborative practice. Silos present barriers that not only limit the flow of

information but prevent responsiveness impacting on the ability to manage complex challenges effectively (Alves & Meneses, 2018).

The implication of siloed care is explained in Barker (1996b) who implies that in cases of high specialisation of nursing roles, it becomes difficult to integrate care provided in various units. It tends to cause collaboration obstacles between departments as nurses are trapped in their respective roles and do not have the opportunities to acquire experience in other areas. Consequently, this can lead to incompetency and inability to respond in times of emergencies or staff shortages across the wider department. Similarly, inflexibility resulting from silos not only impacts the department's responsiveness but also continues to affect the flow of patient care when certain areas of the department experience a staff shortage or when patient flow is high. A delay in the timely redeployment of personnel between sub-departments can lead to delays in patient treatment and a waste of nursing resources. This issue is particularly concerning in areas with a high number of nurses who lack transferable skills. As such it is essential to break silos in order to foster a culture of collaboration that leads to a comprehensive solution (Celestin & Vanitha, 2017).

This concern was also widely reflected in the qualitative data with participants discussing the existence of silos as a result of role specialisation. One such comment stated that: "*Over specialisation creates regimented silos, and that makes it hard for any organisation to change direction on the fly. This is what the current nursing in this department has become".* Nonetheless, the quantitative data suggested that persistence of silos could be mitigated by strong leadership that serves a catalyst for change. 87 percent of the survey respondents, the largest consensus of any question in the survey expressed the view that strong leadership has the potential to reverse siloed approach to working. Thus, fostering an integrated and cohesive nursing workforce. These data are illustrated in figure 13 below.

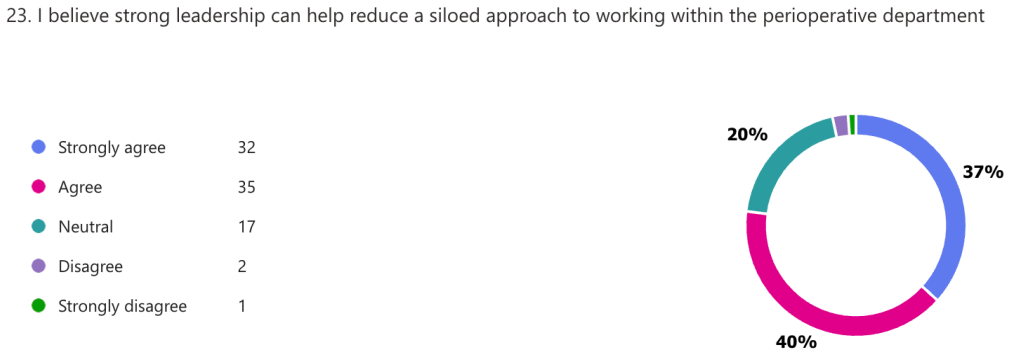


Figure 13: Leadership as a driver to mitigate siloed approach.

The findings from the qualitative and quantitative data analysis, when analysed alongside the literature on the subject matter revealed a current configuration that, while functional and responsive to the immediate perioperative demands, could benefit from a realignment to enhance nursing workforce agility, flexibility, and operational efficiency. The impetus for change is rooted in the present-day realities of the growing pressure on surgical services. Stemming from the accumulated backlog created during the COVID-19 pandemic when elective surgeries were widely suspended. According to the Ministry of Health (2025), demand for surgery in Aotearoa-NZ has increased rapidly, with 10,000 more patients on elective waitlist in the quarter ending December 31, 2024, compared with the same quarter in the previous year. Similarly, as part of target government delivery action, there is a focus on driving actions to ensure access to high-quality healthcare. This includes lifting the volume of surgeries to reduce the elective surgery backlog (Ministry of Health, 2025). While well intended, the target poses an unrealistic challenge that is difficult to achieve without immediate reinforcement of the already struggling nursing workforce capacity in surgical services.

Alternatively, the department could focus on enhancing its capacity by developing a multi-skilled workforce capable of undertaking multifunctional roles. This can be achieved by creating a cross-training programme focused on enhancing nurse's skills and knowledge applicable across various areas of the perioperative care continuum. The latter is a preferred, realistic, and achievable solution to a chronic nursing staff shortage and a watered-down skill mix within the perioperative department, particularly in the operating theatre. This is driven by various factors that continue to

prevent the ability of the surgical services to cope with increased surgery capacity, including a transient nursing workforce, financial constraints and an ageing nursing workforce.

The preference for change was highlighted by participants who insinuated that they did not believe the current configuration was the set-up to maximise efficiency. One participant stated that "*The way the current nursing model works is not necessarily the right way. But it's not wrong either, it's just that there can be different ways, I have seen nurses in the past who have worked in both theatre and in recovery as hybrids, this worked really well".* While the participant described his perception of what worked well as being "hybrid" the description arguably fits within the confines of multi-skilled nursing model configuration was reflected in the quantitative findings. On inquiry if participants believed the department's structure needed to change to an integrated approach 57 percent agreed, 32 percent were neutral, and 10 percent disagreed that the current structure of the department needs to change. Similarly, in another question assessing interest in engaging with a multi-skilled nursing configuration, 71 percent of participants indicated an interest in pursuing learning and development opportunities in different areas. Of the participants, 16 percent were neutral, and 13 percent of the participants indicated that they had no interest in learning new skills in different areas As indicated above, the data analysis and the existing literature suggests that the benefits of adapting to change outweighs the benefits of maintaining the current nursing configuration. Through cross-training of nurses to work in various areas, the perioperative department in Waikato Hospital may be able to nurture a more flexible workforce capable of responding to the fluctuating clinical and operational needs. The study participants affirmed that a multi-skilled nursing workforce would help to improve efficiency of operations, particularly amid the increasing demand for surgery and persistent staffing shortages. An advantage of multi-skilled roles is the ability to offer flexible deployment across units, thereby enhancing staffing efficiency and responsiveness to service demands.

The urgency of such a shift is emphasised in the Lewin's change theory, particularly the unfreezing stage, during which the status quo is destabilised (Adelman-Mullally et al., 2023). For a successful adoption to a multi-skilled workforce, the department's

leadership would need to lead the way in confronting the prevailing fragmentation and advocate for cultural and structural modifications focused on enabling role flexibility and cross-training. Through the process of refreezing existing norms and fostering a more expansive and flexible perception of nurses and nursing roles, the department may transition to a model that is both efficient and capable of responding to the highly dynamic needs of the perioperative setting.

While the findings on the current nursing configurations with the perioperative departments at Waikato Hospital indicates that change is necessary and widely supported, implementing such change is not an easy task. Initiating such a transformational change is a complex task that requires further research, collaboration with experts from the professional development unit and stakeholders. The complexity lies not only in restructuring and establishing educational systems but also on changing the deeply embedded cultural norms and professional identities. This requires strong leadership, strategic planning and organisational commitment to sustain the change. All this amidst a strained health system that continues to function at a fragile level.

6.3 What are the views of registered nurses, operational managers and executive nursing managers on what works well within the perioperative departments at Waikato Hospital?

The Waikato Hospital perioperative departments were found to have numerous strengths including a well-established culture of teamwork in various nursing groups and within the multidisciplinary teams. Teamwork among nurses working in different areas is essential for safe and efficient patient care. Collaboration is particularly important in intra-operative phase of care, where the collaboration of multidisciplinary teams is vital to the success of the surgical procedures and patient safety.

The study also found that staff were dedicated in ensuring patient safety despite the persistent staff shortages. The interviewees highlighted the nurses' commitment to

practising to the best of their abilities and adjusting to the demands of the large patient volume and limited resources. Such commitment ensures that, regardless of the obstacles, patient care remains a top priority and safety is maintained throughout the perioperative continuum. The efficiency of the nurses, particularly of DOSA nurses was another strength observed during the study. DOSA nurses were noted to consistently demonstrate the ability to effectively manage high patient flows despite the longstanding staffing shortages.

This information supports the idea that, despite the challenging circumstances, the perioperative department has a well-skilled and resilient nursing workforce. A workforce capable of delivering high-quality patient care amidst internal and external pressures, such as meeting national surgical efficiency guidelines and addressing staff shortages. It is also evident that teamwork, efficiency and professionalism form the capacity that the perioperative services operate, and thus, its staff members cope with the pressures posed by demands and the scarcity of resources.

To strengthen the nursing workforce, implementing a multi-skilled, agile nursing model is essential. By cross-training nurses to work across different perioperative areas, teamwork that ensures the continuity of care can be enhanced. This approach enables trained nurses to be more flexible and responsive during peak demands or staff shortages, as they can be easily transferred to areas where their skills are needed most.

The ability of cross trained nurses to work flexibly across different area corresponds to the Experiential Learning Theory developed by Kolb who believed that the most efficient learning occurred when people rely on diverse concrete experiences and are able to actively reflect on their learning (Passarelli & Kolb, 2023). Under this model, nurses can explore their boundaries in various clinical settings, acquiring valuable knowledge and skills that not only enhance their own flexibility but also contribute to a cohesive team environment. This experimental action, one of the main aspects of the theory by Kolb would enable nurses to master their skills in different clinical environments and develop a team coherence when every participant of the team would be able to perform a wider scope of activities.

Consequently, the implementation of a multi-skilled model may only enhance the perioperative department strength such that the workforce would be dynamic, flexible, and capable of responding to the demands of the hospital.

6.4 What are the views of registered nurses, operational managers and executive nursing managers in relation to what does not work well within in the perioperative departments at Waikato Hospital.

Although the perioperative department at Waikato Hospital possessed several strengths, the study identified areas for potential improvement. A common theme that emerged from the interview discussions concerning participants' perceptions of what was not working effectively was the extent of the nursing roles specialisation. Participants repeatedly highlighted that the specialisation of nursing roles has contributed to the development of silos, a phenomenon evident within the perioperative department nursing workforce at Waikato Hospital. According to (Cilliers & Greyvenstein, 2012), a siloed mentality has a negative impact on how department members behave towards one another, it creates an "us versus them" mindset. This creates division and barriers to communication, resulting in the development of disjointed work processes with negative outcomes to the organisation, staff and patients (Caseiro & Meneses, 2019). Consequently, groups focused on their own discipline to optimise the quality of their work. As noted by Lau et al. (2024), focusing on discrete components of health instead of the larger consequences leads to system sub-optimisation resulting in the long-term erosion of health outcomes at the expense of the patient. Buchan et al. (2022) argues that clinicians are expected to learn more and more about less and less. Buchan et al. (2022) further suggest that the scope of expertise has become narrowed but increased in depth, the suggestions particularly true for doctors and nurses on specialised wards. The narrowed focus in specialised roles potentially diminish generalised skills in areas that are highly specialised.

The impact of specialisation and isolation particularly in the operating theatre nursing was highlighted with participant's conveying their belief that theatre nurses had

become tunnel-visioned and that the keyhole had become quite extreme. It was believed that nurses had become too specialised in one area of their role, losing the ability to think outside the box. One participant expressed their fear of theatre nursing being at risk of marginalisation. They further suggested that theatre nursing place in the clinical setting may be at risk of replacement by roles such as RNAA or other workforce models such as ODPs. Which are perceived as cost-effective and able to function across a broader area of practice. Participants emphasised that perioperative nurses must assert their professional value by engaging in practice that distinctly reflects the core competencies and critical thinking inherent to the nursing discipline.

Moreover, operating in a siloed structure with extreme specialisation restricts nurses' exposure to different areas within the care continuum. Over time, this creates a disconnect and reduces flexibility, significantly affecting the department's ability to respond to fluctuating staff demands, especially during peak times. While George et al. (2019) suggests that specialisation in practice can enhance the quality of care in specialised areas of practice; it concurrently poses an impediment to career growth and flexibility. Presenting a dilemma to the nurses and the organisation as they endeavour to the pursuit of excellence in a particular area of practice at a cost of broader career opportunities, flexibility and efficiency. As such, a review of strategies that leverage the benefits of quality care while enhancing the mobility of the nursing workforce is essential.

An additional area identified as underperforming pertains to the implementation of holistic care principles among nurses in the perioperative setting. Respondents indicated that, despite nursing practice in the perioperative department being different from any other type of nursing, it fell short of delivery of holistic care in its fullness. Participants indicated that the lack of comprehensive care plans had resulted to a task-oriented, episodic approach to patient care. Nurses in the perioperative department appeared to gradually lose generalised skills traditionally inherent to the nursing profession. The lack of delivery of holistic care in the context of comprehensive care plans was partly justified by the limited interactive opportunities with the patient. Stringent operational demands aimed at maximising efficiency was highlighted as possible reason for comprehensive assessments. Nonetheless literature suggests that

holistic care must take precedence over organisational operations, as such corrective measures must be taken to ensure better patient outcomes. The lack of corrective measures undermines foundational tenets of nursing and poses a risk to patients.

Despite the claims stated above, alternative perspectives suggest that the focus on the traditional definition of holistic care may inadvertently marginalise the subtler, yet equally impactful, dimensions of holistic practice in the context of the operating theatre. Holistic care is not necessarily achieved in engagement in prolonged interactions or formalised routines; rather, it can be effectively delivered even within the briefest moments of patient contact. In these short encounters, holistic care may manifest through attentive presence, active listening, or honouring the patient's and their family's preferences. This may include actions such as following through on a simple request or ensuring the family is adequately informed and engaged. These gestures can significantly contribute to the patient's overall well-being and a sense of being seen and valued as a whole person. This interpretation aligns with person-centred care principles, emphasising that the quality of interaction, rather than its duration, often determines the holistic nature of the encounter. In this sense, a fleeting moment filled with compassion, respect, and responsiveness may fulfil the core tenets of holistic care more fully than a longer interaction that lacks genuine connection.

Another area of underperformance, as indicated by the interviewees was the lack of established pathways to facilitate and encourage cross-skilling among nursing staff. The respondents noted that this was a structural deficit and a barrier to the integration of skills. The establishment of cross-training pathways was found to be a critical aspect in enhancing the flexibility and agility of the nursing workforce. The inability to acquire new skills in various areas, combined with insufficient support mechanisms prevents the shift to an integrated perioperative nursing workforce. It also risks the nurses' reluctance to engage in cross-training. This differs from the lack of interest among nurses but rather reflects inadequate organisational support and clarity.

The literature review suggests that to foster flexibility and nimbleness within the workforce, clear training programmes and robust career development structures must be in place. It is imperative that the perioperative department in Waikato Hospital

reassess the current nursing framework, with the aim of implementing a strategic approach that combines the existing strengths, such as the benefits of specialisation, with robust, flexible training capable of paving the way for a more adaptable, flexible and agile skilled nursing workforce.

Part 2: The significance of the findings

6.5 A way forward

The study findings have future implications for perioperative nursing in Waikato Hospital. The support for adopting an agile, multi-skilled perioperative registered nurse model shows significant potential despite acknowledging various concerns and challenges. Thus, there is a need to rethink how surgical services are resourced and delivered. The literature review combined with the data findings suggest that implementing a multi-skilled registered nurse model provides significant benefits. These include enhancing workforce flexibility, improving workflow and efficiency, and strengthening team resilience. A nursing workforce trained to work across multiple areas and in multiple roles creates the ability for the department to effectively allocate nursing resources to meet daily operational demands, including responding to emergencies and unexpected short-notice changes. The model not only supports continuity of care, but it fosters professional development, contributes to consistent patient outcomes, and collaboration among different teams. The adoption of a multi-skilled adaptable and agile nursing workforce is a proactive measure that mitigates the health system challenges related to staffing issues. It is an essential strategy to support quality service in the context of ongoing staffing shortages, rising demand for surgery and increased patient complexity. As noted by Arora (2023), cross trained nurses with transferable skills hold a significant value in the future workforce, an essential quality in a thriving and evolving job market.

As observed by Gnanlet et al. (2023), developing a flexible and adaptable health workforce enhances the continuity of patient care, workforce resilience, and generates operational efficiency by lessening reliance on conventional role structures. However, the study emphasises that effective implementation is only possible by addressing concerns about professional identity, expertise, and expectations around workload demand. Furthermore, the findings imply that senior leadership have to be proactive about adopting an enduring learning culture and valuing agility as an essential competency. Notably, the findings position Waikato Hospital at the forefront in advancing an innovative perioperative nursing model that optimises care delivery

through the redeployment of multifunctional nursing resources across diverse perioperative clinical setting.

In summary, this research indicates that multi-skilling is more than an operational change; it is a strategic, cultural, and clinical development in the way perioperative care can be provided within an evolving healthcare system.

6.5.1 Future consideration of the workforce

The study findings offer critical insights that guide future considerations for the perioperative nursing workforce development. More than 50 percent of the survey participants preferred a shift to a flexible and multi-skilled workforce. They believed that a multi-skilled approach would increase operational effectiveness, decrease surgical wait times and accelerate the flow of patients (based on the results of the quantitative survey). This concurs with the qualitative findings in which the nurses explained that cross-training and flexibility of roles would enable smooth redeployment of nursing staff, particularly during the time of peak demand. Moreover, responses from the focus groups highlighted the advantages of multi-skilled workforce as being able to provide continuity of care during staff shortages. The possibility of safely working in other perioperative areas within the department was of great interest to nurses. A multi-skilled workforce has the flexibility to help especially in times of crisis like the COVID-19 pandemic when a rapid staffing adjustment was required to meet the standard of care. Nonetheless, despite of the study findings indicating that the shift towards a multi-skilled model is highly effective in increasing operations efficiency, workforce resilience and continuity in patient care; a multitude of challenges exist.

6.5.2 Challenges to future configuration

One challenge to the development of multi-skilled configuration is the resistance to change by nursing workforce. The study identified that nurses were apprehensive about the possibility of the loss of professional identities, loss of the existing skills and the maintenance of the newly acquired skills. The perioperative nursing has become technical and so specialised that nurses felt that it was not feasible to competently cross-train nurses to work across several areas. This is evidenced by statements from

a participants summarised in Table 12. Nurses believed that these concerns directly contribute to resistance to change.

Table 12: Concerns related to change

Nurses' concerns related to change	
anonymous	It is very difficult for nurses to have the skills to work in a number of environments. theatre nursing has become very technical, so it is difficult for nurses to become experts in a number of specialties.
anonymous	I'm unsure how a multi-skilled nurse can work in all these areas and maintain their skills. All areas are highly specialised these days and require consistent time in that area to keep skills up to date.
anonymous	I think staff work in areas they are drawn to, for some operating theatre is of no interest so they will be more resistant to learning that specialty. I believe it is important to have staff who are specialised and experts in their field to give the best care possible however there is benefit in being able to help each other out. As a patient I want the very best nurse with the most experience looking after me at each step, I'd be concerned skill may be diluted.
anonymous	R/N's choose where they want to work and they get skilled up in that area, they form a good team and bond with those they work with, they model their lives around their working hours and find a sense of calm and belonging. It is the, " jack of all trades master of none", when you are spread over so many different departments, I don't personally agree with it. It is nice to know what other departments do, but I don't agree with moving RNs to multiple different departments on a continual basis.
anonymous	I feel that another barrier to this is the large size of the perioperative department and the lack of experienced senior nurses. In theatre there are a lot of new/junior nurses who are still learning so it might be difficult to get them out of their area to have additional training in a new area without putting strain on the staffing levels.
anonymous	I find that with my background of working in different countries, a generalized peri-operative nurse would be dangerous. Sure, being skilled in another similar area would be manageable but not a generalized one. One, has to realize that each department is very specialized in each way from items, instruments to even software being used. It would be a ginormous undertaking for one person to learn all of it and remain competent in each. It may sound counterintuitive, but being a specialized nurse is more cost effective if you look at it in terms of longevity of the expensive equipment used in each department, less wasteful of items discarded due to wrong one, improper handling or use, saves time as they know where it is stored and might be able to suggest which items would better suit the process, able to sort out issues quicker. We may be able to help in terms of generalized nursing skills such as IV insertion and OBS monitoring but otherwise it needs to be done by someone specialized in doing it. It is safer and fair to patients as well.
anonymous	Whilst I enjoy opportunities to extend and expand my learning in other areas, I feel strongly that it would not be beneficial to attempt to merge the 'on the floor' nursing roles within the perioperative department. Having worked solely in IR for the last few years, I have become very familiar and comfortable in such a niche specialisation, however, there are still occasions where I have not been involved in a particular case for a long time and need to think very hard about what I am doing. For a nurse to work competently, safely, and comfortably in all of these perioperative areas, they would need a incredibly broad knowledge base, which I feel is near impossible for a single person to achieve to the level that would be required.
anonymous	I believe my department is too different from the other parts of the perioperative service to be able to chop and change. I believe that if I wanted to have a procedure done, I would want an expert in all areas looking after me, for example the experienced DOSA nurse, the experienced theatre nurse of that theatre, the experienced PACU nurse. I don't want someone who isn't skilled or working under the direct supervision of someone skilled looking after me or my family.

As demonstrated by the nurses' views on Table 24, resistance to change is a profound obstacle of adopting a multi-skilled workforce model. To reduce this resistance, the study suggests undertaking of a well-supported phased approach cross-training embedded on a structured framework that is supported by leadership. Another challenge to the future configuration is the time and resources required to set- up, implement sustain the training pipeline. The interviewees, especially those in management position highlighted concerns regarding the financial cost and the time it would take to properly train to work in various positions. The same concern was reflected in the survey data with 56 percent of participants stating that time was a limiting factor to cross-training. An insufficient number of resources to be used in the training such as the absence of the systematic programmes of multi-skilling were also mentioned. Concerns regarding patient safety also emerged as a limiting factor to the development of the multi-skilled perioperative model. The fear of compromising patient safety as a result of new leaners lacking specialised skills in different areas were highlighted. Further, interviewees feared that potential expansion would result either in mistakes or to the overall decrease of the quality of care delivered. While concerns raised regarding potential compromises of patient safety in the context of flexible nursing redeployment may be perceived as real, they remain unfounded. Nurses assigned to areas different from their primary roles would be supported until they demonstrated sufficient competency. They would be fully supported through structured orientation, supervision and ongoing mentorship. This aligns with the established principles of clinical governance and accountability, thereby ensuring safe care throughout the transition.

6.5.3 A Future configuration

The results of this research demonstrate the premise and limitations on the foundation of developing a complex, agile perioperative nursing staff at Waikato Hospital. Although the data are equally favourable when their impact on the benefits of the model is mentioned, the study also underscores the importance of addressing staff-related concerns. These include the risks of role dilution, patient safety issues, time and financial constraints. The ideal future perioperative nursing workforce configuration should involve a phased and adaptive approach. The approach should

incorporate a gradual stepwise multiskilling, ensuring that degradation of specialised knowledge does not occur.

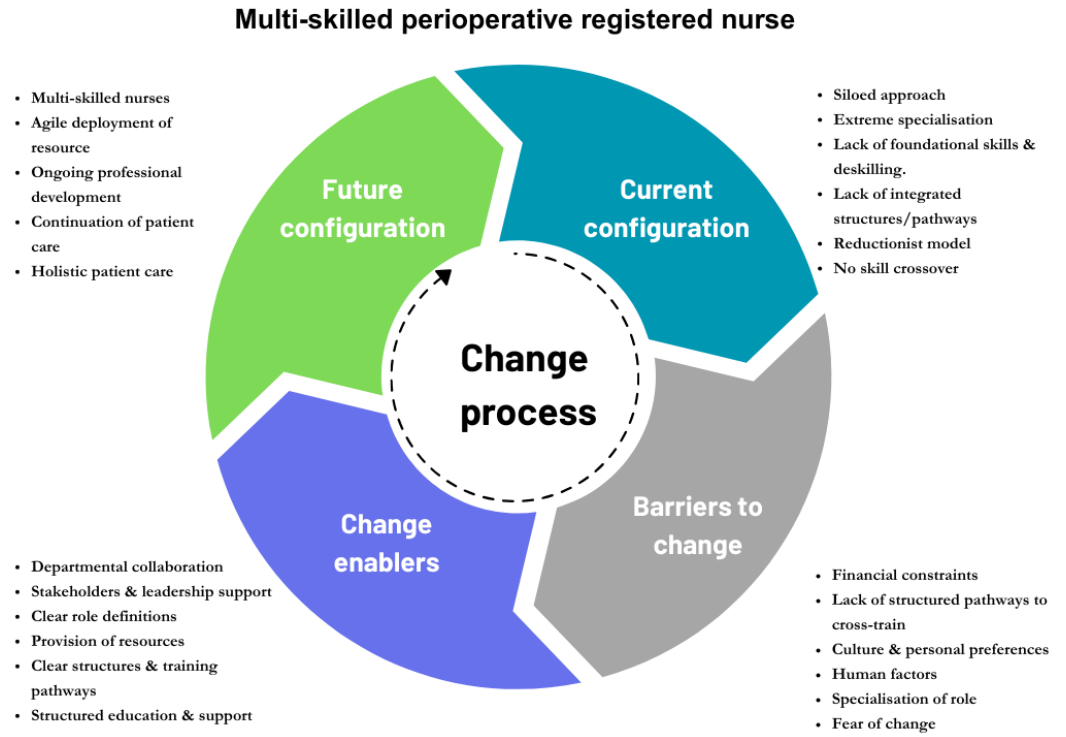


Figure 14: The change process: Towards the optimal perioperative nursing model

The success of the model will require concerted efforts by the team leadership to overcome resistance and ensure nurses feel supported throughout the transition. This, in addition to addressing concerns raised, including the time it will take to train, fear of the loss of skills and compromise to patient safety (See Figure 14).

Part 3: Limitations, conclusions and implications

6.6 Study limitations

While this study provides insights into the development of a multi-skilled perioperative model within Waikato Hospital, certain limitations must be acknowledged. The mixed-methods design provides a significant challenge. It complicates data interpretation without a clear overarching understanding of the outcomes. This makes it challenging to derive meaningful insights from the collected data. Responses from participants, especially in the context of the COVID-19 pandemic, may have been influenced by healthcare pressures at the time. This imbalance may have been caused by the participants prioritising short-term staffing over long-term strategy. Less time and fewer resources could have ruled out a closer examination of subgroups within the perioperative nursing profession, such as novices versus more experienced nurses.

Moreover, a significant limitation to this study was the inability to conduct the planned focus group discussions due to the challenges of coordinating all participants at a common time. Scheduling conflicts especially among executives and senior clinicians driven by workload demands prevented the alignment of participants. This necessitated an abrupt shift in methodology. As a result, individual interviews were conducted. While the interviews yielded valuable, rich, in-depth data, it limited a collective dialogue, share reflection and exchange of ideals typically attained in group discussions.

6.6.1 Internal limitations

The research was limited by the small sample size and the lack of internal diversity across different areas within the department. Although participants were mainly from the perioperative department, it is possible that the sample does not accurately reflect the varied perspectives of perioperative nurses throughout Aotearoa-NZ. Notably absent were the voices of perioperative nurses from the small, rural or private surgical centres. Secondly, the participation was voluntary, and this could have led to the inclusion of those who passionately agreed or disagreed, thereby biasing the results in this selection process.

This is one of the internal restrictions, whereby the researcher influences the data analysis process. Although utilizing qualitative research methods is stringent, coding thematically and interpreting from that point on is also subjective. To curb bias, reflexive measures were employed, yet professional background and experiences of the researcher shaped some of the analytical choices. They may have also worked with a more significant, multi researcher, team that could better cross check conclusions. Results of these limitations emphasize the need to be careful how to generalize results and support the future research, based on larger, more heterogeneous samples and multi researcher triangulation.

6.6.2 External limitations

Factors that lay outside the scope of the research design, and beyond the power of the research design, were challenges that were provided by externals, system wide. In one of the pandemic's fundamental transformations of healthcare operations, participants are likely to revise up how important and threatening the workforce shortage is and the need for an agile model. Crisis setting can mean that some of the participants respond differently than normal, that the responses are transient possibly due to something, no longer term. What the future holds for healthcare systems when healthcare systems reach post pandemic equilibrium and settle into stabilisation is yet to be known. This may change perceptions of an agile and multi skilled workforce requirement changing the trajectory of the future studies.

Additionally, differences in the healthcare systems across the world and Aotearoa-NZ make such results difficult to apply more widely. Urban versus rural hospitals as well as public versus private healthcare systems all have significantly different configurations of healthcare related to the staffing profiles, patient profiles, and funding systems. As a result of this research, the results of this research are applicable to Te Whatu Ora Waikato only and cannot be applied to all perioperative environments regionally or internationally without specific adaption into local settings. These results would then be further substantively compared in several health care settings to validate their universal applicability.

The final and the most significant limitation to the study involved a malfunction within the online data collection system. The system failure resulted in incomplete data from the survey. The incomplete responses rendered those responses invalid for analysis. Impacting on the overall response pool. The unexplained technical failure was beyond the researcher's control.

6.7 Conclusions

This study has shown that the concept of development of a perioperative multi skilled, agile nurse is possible. It can positively contribute to the operational efficiency, nursing workforce resilience and better patient outcomes. However, changes beyond the nursing structure needs to occur, support for cultural change, leadership engagement, and continued investment in professional development should be implemented for an effective change. The study uncovered a favourable uptake of the concept of agility in the workforce, however a prevailing high levels of uncertainty about professional identity, role dilution, and the lack of supportive infrastructure was highlighted.

The conclusions imply that multi skilling and flexible workforces should be approached with careful consideration and structured planning. It should not be used as a fix to a crisis, but as a long-term solution to a problem that is likely to remain if not addressed effectively. Waikato Hospital can future proof itself against staffing challenges including staffing shortages, surge episodes and technological upheaval by implementing agility into perioperative nursing workforce. However, a move towards a multi-skilled model must be spooled with regard to protection of skills and expertise and against dilution of nursing skills while allowing for the 'branching out' of competency development.

6.8 Implications for education practice

The educational implications for these results are tremendous for nursing. To be effective, the conventional perioperative education programmes must focus on incorporating specialisation to the cross-training, the adaptability to roles and the need for interdisciplinary collaboration modules. Perioperative educational offerings must be a uniform offering of simulation education, scenario-based education and team competencies. Given the complete surgical continuum, early confidence and speed of

skills are promoted by clinical rotations being constructed to allow for learners to experience the full spectrum of the continuum. It must be acknowledged that healthcare organisations have to develop the ambience for continuing education and diversification of skills. Professional development activities cannot be standalone activity because professional development activities include ongoing programmes to develop nurses' competencies. However, managers need to promote and reward adaptability and flexibility in nursing as a whole. Extended contributions of perioperative nurses could be formally recognised and rewarded with some dual or multi-role certifications, which would make flexible workplace and sustainable.

6.9 Policy implications

Agility of the workforce is a health system priority that policy at the level of the health system needs to create. Support funding for cross-training would be provided, specific guidelines on expansion of professional scopes would be set and nurses would have the opportunity to explore knowledge in their professional development time without being overburdened. Nursing Council of New Zealand can reflect on creating competency frameworks that promote, and govern, multi skilling in perioperative environments at a national level. This giving legitimacy and support require to ensure sustainability and adoption at a national level.

Moreover, workforce planning policy ought to depart from singular speciality, stringent resource orientations to one that is flexible in terms of resource orientation as far as competencies are concerned. Systematic levels of workforce shortages can be overcome by incorporating flexibility into contracts of employment, by developing flexible team models and by encouraging regional cooperation for cross-training. These are some important policy changes that will be essential in the ongoing mission to build resilient and adaptable health system in response to emerging healthcare needs.

6.10 Future research

This study highlights the need for continued exploration, particularly through a pilot study designed to evaluate the effectiveness and feasibility of the proposed data analysis outcomes in a real clinical setting. The investigations should monitor outcomes over several years in several key areas including staff turnover, patient safety,

surgical flow, and healthcare system responsiveness. Further research is needed to better understand both the psychological and the cultural constraints associated with multi-skilling, and implementation or support mechanisms that aid nurses through transitions across professional identity and practice.

Comparative research across different hospitals, regions, and countries can help promote the adoption of flexible staffing. It is essential to provide nurses with opportunities to develop and maintain a wide range of competencies, especially those related to emerging technologies such as AI-based surgical planning, robotics and virtual reality simulation. Lastly, future studies should establish a robust evidence base to support the effective, ethical and sustainable development of perioperative nursing practice.

Appendices

Appendix 1: University of Waikato Ethics approval

Appendix 2: Interview Schedule for Health Professionals

Appendix 3: Survey questions

Appendix 1: University of Waikato Ethics Approval

The University of Waikato
Private Bag 3105
Gate 1, Knighton Road
Hamilton, New Zealand

Human Research Ethics Committee
Roger Moltzen
Telephone: +64021658119
Email:humanethics@waikato.ac.nz

THE UNIVERSITY OF WAIKATO
Te Whare Wānanga o Waikato

27 November 2023

Judy Ngatia
Te Huataki Waiora School of Health
DHECS
By email: murraydiane@me.com

Dear Judy

HREC(Health)2023#43 : To explore the creation of a multi-skilled adoptable/agile perioperative Registered Nurse

Thank you for your responses to the Committee feedback.

We are now pleased to provide formal approval for your project.

Please contact the Committee by email (humanethics@waikato.ac.nz) if you wish to make changes to your project as it unfolds, quoting your application number with your future correspondence. Any minor changes or additions to the approved research activities can be handled outside the monthly application cycle.

We wish you all the best with your research.

Regards,

Emeritus Professor Roger Moltzen MNZM
Chairperson
University of Waikato Human Research Ethics Committee

Appendix 2: Interview Schedule for Health Professionals

PROJECT TITLE: **TO EXPLORE THE CREATION OF A MULTI-SKILLED ADOPTABLE/ AGILE PERIOPERATIVE REGISTERED NURSE**

Researcher: Judy Diane Ngatia

Email: jn210@student.waikato.ac.nz

Mobile: 0211604740/ 0272148389

The University of Waikato- (MHsc).

THE UNIVERSITY OF WAIKATO
Te Whare Wānanga o Waikato

Interview Schedule for Health Professionals

Questions for Health Professionals (Interviews)	
Question	**Prompts**
What works well in relation to current manner by which perioperative nursing works?	Describe the current way in which the service is configured Touch points, with patient, with family, between staff • **Patient centred care?** • **Whanau participation/involvement?** • **Nursing assessment** – aligned with Te Ao Māori, the t Hui Process that encompass: Mihimihi- initial greeting engagement), Whakawhanaungatanga (making a connection/building relationships) Kaupapa (attending to the purpose of the encounter), and Poroaki/Whakamutunga (closing the session) Continuation of care Touch points for staff: • **Expertise/knowledge** • **PD** • **Job satisfaction.**
What doesn't work well in relation to current manner by which perioperative nursing works?	Describe the current way in which the service is configured Touch points, with patient, with family, between staff • **Patient centred care?** • **Whanau participation/involvement?**

PROJECT TITLE: **TO EXPLORE THE CREATION OF A MULTI-SKILLED ADOPTABLE/ AGILE PERIOPERATIVE REGISTERED NURSE**

Researcher: Judy Diane Ngatia

Email: jn210@student.waikato.ac.nz

Mobile: 0211604740/ 0272148389

The University of Waikato- (MHsc).

Interview Schedule for Health Professionals

Questions for Health Professionals (Interviews)	
Question	**Prompts**
What works well in relation to current manner by which perioperative nursing works?	Describe the current way in which the service is configured Touch points, with patient, with family, between staff • **Patient centred care?** • **Whanau participation/involvement?** • **Nursing assessment** – aligned with Te Ao Māori, the t Hui Process that encompass: Mihimihi- initial greeting engagement), Whakawhanaungatanga (making a connection/building relationships) Kaupapa (attending to the purpose of the encounter), and Poroaki/Whakamutunga (closing the session) Continuation of care Touch points for staff: • **Expertise/knowledge** • **PD** • **Job satisfaction.**
What doesn't work well in relation to current manner by which perioperative nursing works?	Describe the current way in which the service is configured Touch points, with patient, with family, between staff • **Patient centred care?** • **Whanau participation/involvement?**

PROJECT TITLE: **TO EXPLORE THE CREATION OF A MULTI-SKILLED ADOPTABLE/ AGILE PERIOPERATIVE REGISTERED NURSE**

Researcher: Judy Diane Ngatia

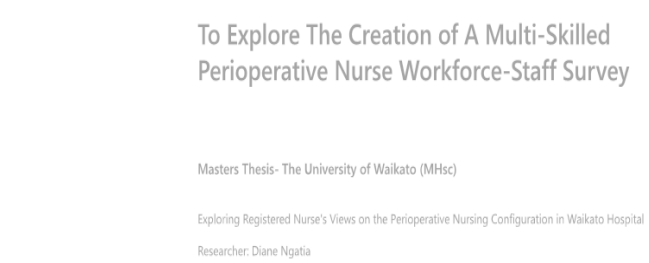
Email: jn210@student.waikato.ac.nz

Mobile: 0211604740/ 0272148389

The University of Waikato- (MHsc).

	Are there potential drawbacks limiting cross-training opportunities within the siloed nursing approach?
What would accelerate adopting the model?	Are there leadership practices that can help mitigate siloes approaches? Are you aware of successful models from other healthcare organisations that could be applied to improve the nursing workforce integration in the perioperative department? What recommendations do you believe can be taken to create a more cohesive and collaborative nursing workforce within the perioperative department while still maintaining specialised roles?
Would reconfiguring the nursing workforce in the perioperative department be beneficial in fostering collaborative care, and increase efficiency?	How and why?
If the model is in place, what would we see in terms of improved outcomes for the patient and staff?	Give examples of improved patient outcomes or safety measures resulting from the revised utopic approach to perioperative nursing?

Appendix 3: Survey



To Explore The Creation of A Multi-Skilled Perioperative Nurse Workforce-Staff Survey

Masters Thesis- The University of Waikato (MHsc)

Exploring Registered Nurse's Views on the Perioperative Nursing Configuration in Waikato Hospital

Researcher: Diane Ngatia

* Required

Participant Information Sheet (Online Survey), & Consent

Survey Exploring Registered Nurses' Views on Perioperative Nursing Configuration in Waikato Hospital
Before you decide whether or not to take part, please read the following information, which explains why this research is being done and what your involvement would be. Talk to others if you wish, and please feel free to ask questions if there is anything that you need clarification on. Thank you for reading this.

Research aim:
This study aims to explore the future direction of the perioperative nursing model by exploring the viability of creating a multi-skilled, agile perioperative registered nurse equipped with skills to work across the perioperative department. The research aims to explore the perception of the Executive managers, Operations managers and Registered nurses on the current nursing configuration within the perioperative department.

Why you have been chosen to participate:
I am asking all Registered nurses in the perioperative department to participate because they work in an organisation that has agreed to participate in the study.

Your Part:
For this part of the research, I would like you to complete a survey asking you about your work, which should take about 15 minutes to complete. I would like to know your views and experiences working in the Te Whatu Ora Waikato perioperative department.

How to take part:
Please complete the online survey by ticking the checkbox to give consent. You will be required to tick the checkbox to proceed.

Confidentiality:
The survey is anonymous therefore, no personal identifying details will be required to participate. Please do not state any identifying information during the survey. Every effort will be made to ensure confidentiality by the researcher, including the following:

- Ensure all data will stay in a secure password and virus-protected computer account at the University of Waikato.
- Your organisation will not have access to your completed questionnaire. The information you give us in the survey
- will be entered into an anonymised database containing no personal details about you.

What are the possible problems and disadvantages of taking part:
I do not anticipate any problems arising from participation in this study.

What are the possible benefits of taking part:
There are no direct personal benefits to you from this study. However, your participation will enable us to understand your views about what we are doing well and what we can improve on in future. I will give feedback on my findings to update you about the study if required.

What will happen to the results of the research study:
The results of this study will be reconciled and written up for the thesis. I am happy to send you a free copy of the research report if you would like one.

Declaration to participant: If you take part in the survey, you have the right to:

- Refuse to answer any question.
- Ask further questions about the study.
- Be given access to a summary of the findings from the study when it is concluded.
- Participants will have a two-week withdrawal period from the submission date. After that, the withdrawal
- option will not be available as the responses are anonymous; thus, retrieving them from the repository is impossible.
- The online survey will provide checkbox option to withdraw.

Voluntary Participation:
Participation is voluntary, and participants can withdraw from the survey up to 2 weeks after submitting.

1. CONSENT *

- ◯ Yes, I give consent to the survey
- ◯ I wish to withdraw my consent

Demographic Information

2. What ethnic group(s) do you identify with? Select all that apply to you.

- ◯ New Zealand European
- ◯ Maori
- ◯ Pacific
- ◯ Other Europeans
- ◯ Asian
- ◯ Other

3. Please select your age range:

- ◯ 18-24
- ◯ 25-34
- ◯ 35-44
- ◯ 45-54
- ◯ 55-64
- ◯ 65+

4. Which of the following best describes your gender?

- ◯ Male
- ◯ Female
- ◯ Non-binary
- ◯ Prefer not to say

5. What is your highest qualification?

- ◯ Registered nurse
- ◯ Informal or formal education
- ◯ Post nursing registration
- ◯ Postgraduate certificate (PGCert)
- ◯ Postgraduate Diploma (PGDip)
- ◯ Master (e.g., MA, MSc, MBA)
- ◯ PhD

6. How long have you practiced as a nurse

- ◯ Less than one year (NETP)
- ◯ 1-5 years
- ◯ 6-10 years
- ◯ 10+years

Questions About Your Role in the Perioperative Department

7. What area within the perioperative department do you work

8. Based on your understanding, what makes up the perioperative service? **(Please tick all that apply).**

- [ ] DOSA
- [ ] PACU
- [ ] Endoscopy
- [ ] Theatre
- [ ] Cathlab
- [ ] Interventional Radiology
- [ ] Inpatient Pain Service
- [ ] Patient Blood Management Service (PBM)
- [ ] Anaesthetics Assessment Clinic (AAC)

9. Please indicate your current role within the perioperative department

- ◯ Nurse on the floor
- ◯ Registered Nurse Anaesthetic Assistant (RNAA)
- ◯ Clinical Nurse Coordinator (CNC)
- ◯ Floor nurse coordinator
- ◯ Surgical First Assistant (SFA)
- ◯ Associate Charge Nurse Manager (ACNM)
- ◯ Charge Nurse Manager (CNM)
- ◯ Nurse Manager (NM)
- ◯ Clinical Nurse Specialist (CNS)
- ◯ Specialty Clinical Nurse (SCN)

10. What is your level of satisfaction with your current role in the perioperative department concerning the following indicators

	Strong agree	Agree	Neutral	Disagree	Strongly disagree
Inter-departmental team collaboration is consistently excellent	○	○	○	○	○
Inter-departmental skill sharing is consistently excellent	○	○	○	○	○
Inter-departmental workload sharing is consitently excellent	○	○	○	○	○

11. Do you believe you will still be in your current role within the next year?

- ○ Yes
- ○ No
- ○ Unsure

12. The team work across different areas in the perioperative department is effective

- ○ Strongly agree
- ○ Agree
- ○ Neutral
- ○ Disagree
- ○ Strongly disagree

13. There is clear understanding of different nursing roles within the perioperative department

- ○ Strongly agree
- ○ Agree
- ○ Neutral
- ○ Disagree
- ○ Strongly disagree

14. There is clear understanding of how nursing roles integrate within the perioperative department

- ◯ Strongly agree
- ◯ Agree
- ◯ Neutral
- ◯ Disagree
- ◯ Strongly disagree

15. I feel sufficiently skilled to work across the following areas with the perioperative department.

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
DOSA	◯	◯	◯	◯	◯
Theatre	◯	◯	◯	◯	◯
PACU	◯	◯	◯	◯	◯
Endoscopy	◯	◯	◯	◯	◯
IR	◯	◯	◯	◯	◯
Patient Blood Management	◯	◯	◯	◯	◯
Anaesthetics Assessment Clinic	◯	◯	◯	◯	◯
Inpatient Pain Service	◯	◯	◯	◯	◯

16. I believe that nursing teamwork across the department is excellent

	Very satisfied	Somewhat satisfied	Neutral	Somewhat dissatisfied	Very dissatisfied
DOSA	◯	◯	◯	◯	◯
Theatre	◯	◯	◯	◯	◯
PACU	◯	◯	◯	◯	◯
Endoscopy	◯	◯	◯	◯	◯
IR	◯	◯	◯	◯	◯
Patient Blood Management	◯	◯	◯	◯	◯
Anaesthetics Assessment Clinic	◯	◯	◯	◯	◯
Inpatient Pain Service	◯	◯	◯	◯	◯

17. All members of the nursing team, irrespective of what position they have, fully understand their role and the responsibilities

	Very satisfied	Somewhat satisfied	Neutral	Somewhat dissatisfied	Very dissatisfied
DOSA	○	○	○	○	○
Theatre	○	○	○	○	○
PACU	○	○	○	○	○
Endoscopy	○	○	○	○	○
IR	○	○	○	○	○
Patient Blood Management	○	○	○	○	○
Anaesthetics Assessment Clinic	○	○	○	○	○
Inpatient Pain Service	○	○	○	○	○

18. There is clear understanding of how nursing roles integrate within the perioperative departmentThe manner by which the perioperative department is currently configured into five separate sub departments is the best way possible and should not be changed

	Very satisfied	Somewhat satisfied	Neutral	Somewhat dissatisfied	Very dissatisfied
DOSA	○	○	○	○	○
Theatre	○	○	○	○	○
PACU	○	○	○	○	○
Endoscopy	○	○	○	○	○
IR	○	○	○	○	○
Patient Blood Management	○	○	○	○	○
Anaesthetics Assessment Clinic	○	○	○	○	○
Inpatient Pain Service	○	○	○	○	○

Questions About the Current Nursing configuration Versus a Multi-skilled Model

Please comment on the following statements to the extent whether you agree or disagree

19. All members of the nursing team, irrespective of what position they have, fully understand their role and the responsibilities as described by their scope of practice and position description.

- ◯ Strongly agree
- ◯ Agree
- ◯ Neutral
- ◯ Disagree
- ◯ Strongly disagree

20. I believe that the way in which the department is organised into five sub departments is the best way to deliver holistic high-quality care to our patients

- ◯ Strongly agree
- ◯ Agree
- ◯ Neutral
- ◯ disagree
- ◯ Strongly disagree

21. I believe that the structure of the department needs to change to a more integrated approach that facilitates the development of a multi-skilled nursing workforce.

- ◯ Strongly agree
- ◯ Agree
- ◯ Neutral
- ◯ Disagree
- ◯ Strongly disagree

22. I would be interested in pursuing learning and development opportunities in different areas from which I am currently working in.

- ◯ Strongly agree
- ◯ Agree
- ◯ Neutral
- ◯ Disagree
- ◯ Strongly disagree

23. I believe strong leadership can help reduce a siloed approach to working within the perioperative department

- ◯ Strongly agree
- ◯ Agree
- ◯ Neutral
- ◯ Disagree
- ◯ Strongly disagree

24. The physical environment of the department makes changes for the better difficult

- ◯ Strongly agree
- ◯ Agree
- ◯ Neutral
- ◯ Disagree
- ◯ Strongly disagree

25. The culture of the department gets in the way of any change for the better

- ◯ Strongly agree
- ◯ Agree
- ◯ Neutral
- ◯ Disagree
- ◯ Strongly disagree

26. I believe the following are barriers to creating an integrated model that allows nurses to work across all areas of the perioperative department? **(Use the arrows on the right-hand side to rank barriers from the highest to least).**

- Culture
- Resistance to change
- Inadequate staffing levels
- Limited support from leadership
- Age of staff members
- Financial constraints
- Fear of the unknown

27. Any other comments?

References

Abbott, A. (1988). The system of professions: An essay on the expert division of labor. *Chicago: Chicago UP*.

Abbott, H., & Booth, H. (2024). *Foundations for operating department practice: Essential theory for practice*. McGraw-Hill Education (UK).

Abdullah, R., & Fakieh, B. (2020). Health Care Employees' Perceptions of the Use of Artificial Intelligence Applications: Survey Study. *Journal of Medical Internet Research*, *22*(5), e17620. https://doi.org/10.2196/17620

Adelman-Mullally, T., Nielsen, S., & Chung, S. Y. (2023). Planned change in modern hierarchical organizations: A three-step model. *Journal of Professional Nursing*, *46*, 1-6. https://doi.org/https://doi.org/10.1016/j.profnurs.2023.02.002

Adeyoyin, S. O., Agbeze-Unazi, F., Oyewunmi, O. O., Adegun, A. I., & Ayodele, R. O. (2015). Effects of Job Specialization and Departmentalization on Job Satisfaction among the Staff of a Nigerian University Library. *Library Philosophy and Practice*, 1-19. https://ezproxy.waikato.ac.nz/login?url=https://www.proquest.com/scholarly-journals/effects-job-specialization-departmentalization-on/docview/1785387319/se-2?accountid=17287

https://waikato.primo.exlibrisgroup.com/openurl/64WAIKATO_INST/64WAIKATO?url_ver=Z39.88-2004&rft_val_fmt=info:ofi/fmt:kev:mtx:journal&genre=article&sid=ProQ:ProQ%3Alibraryscience&atitle=Effects+of+Job+Specialization+and+Departmentalization+on+Job+Satisfaction+among+the+Staff+of+a+Nigerian+University+Library&title=Library+Philosophy+and+Practice&issn=&date=2015-01-01&volume=&issue=&spage=1&au=Adeyoyin%2C+Samuel+Olu%3BAgbeze-Unazi%2C+Florence%3BOyewunmi%2C+Olatundun+Oluwatoyin%3BAdegun%2C+Adewale+Isau%3BAyodele%2C+Rafiu+Olabamiji&isbn=&jtitle=Library+Philosophy+and+Practice&btitle=&rft_id=info:eric/&rft_id=info:doi/

Ahmed, I. (2019a). Staff well-being in high-risk operating room environment: Definition, facilitators, stressors, leadership, and team-working-A case-study from a large teaching hospital. *International journal of healthcare management*, *12*(1), 1-17. https://doi.org/10.1080/20479700.2017.1298228

Ahmed, I. (2019b). Staff well-being in high-risk operating room environment: Definition, facilitators, stressors, leadership, and team-working—A case-study from a large teaching hospital. *International journal of healthcare management*, *12*(1), 1-17.

Al-Oufi, H. H., Al-Oufi, S. S., Al-Johani, A. A., Al-Maghthawi, O. A., Al-Suhaimi, A. Z., Al-Mutairi, R. F., & Al-Muzini, E. A. (n.d). The Collaboration between Anesthesia and Surgical Technicians in Maintaining a Sterile Environment Marwan Khalif Al-Ahmadi Anesthesia Technician.

Alves, J., & Meneses, R. (2018). Silos mentality in healthcare services. 11th Annual Conference of the EuroMed Academy of Business,

Ankersmit, F. R. (2021). KOSELLECK ON "HISTORIES" VERSUS "HISTORY"; OR, HISTORICAL ONTOLOGY VERSUS HISTORICAL EPISTEMOLOGY. *History and theory :Studies in the philosophy of history*, *60*(4), 36-58. https://doi.org/10.1111/hith.12235

Arora, P. B. (2023). Building Resilience in the future workforce: The role of continuous learning and transferable skills. *BSSS J. Educ*, *12*, 91-105.

Aspers, P., & Corte, U. (2019). What is qualitative in qualitative research. *Qualitative sociology*, *42*, 139-160.

Association of periOperative Registered Nurses. (n.d.). *Perioperative Nursing: Scope and Standards of Practice*. AORN Retrieved 13/04/2025 from https://www.aorn.org/guidelines-resources/clinical-resources/standards-of-practice

Australian Government. (2024). *Migration strategy: Getting migration working for the nation. For workers. For Business. For all Australians.*: Australian Government

Australian Government Department of Health. (2021). National medical workforce strategy 2021–2031. In: Canberra Department of Health and Ageing Canberra.

Australian Medical Association. (2023). Addressing the Elective Surgery Backlog. In.

Bagshaw, P., Potte, J. D., Hornblow, A., Hudson, B., Toop, L., Nicholls, M. G., Frampton, C., Bagshaw, S., Gauld, R., & Frizelle, F. (2023). Assessment of unmet secondary elective healthcare need—itself in need of acute care in Aotearoa New Zealand. *New Zealand Medical Journal*, *136*(1569), 7-10. http://wintec.idm.oclc.org/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=cul&AN=161665093&site=eds-live&scope=site

Barker, M. (1996a). Should there be a nursing presence in the operating theatre? *British journal of nursing (Mark Allen Publishing)*, *5*(18), 1134-1137. https://doi.org/10.12968/bjon.1996.5.18.1134

Barker, M. (1996b). Should there be a nursing presence in the operating theatre? *British Journal of Nursing*, *5*(18), 1134-1137.

Benjamin, G. C. (2020). Ensuring health equity during the COVID-19 pandemic: The role of public health infrastructure. *Revista panamericana de salud pública*, *44*(70), 1-4. https://doi.org/10.26633/RPSP.2020.70

Benze, C., Lisa Spruce, & Groah, L. (2021). AORN Perioperative nursing: Scope and standard of practice

. Retrieved 2021, from

Berg, U., Berg, M., Rolfson, O., & Erichsen-Andersson, A. (2019). Fast-track program of elective joint replacement in hip and knee—patients' experiences of the clinical pathway and care process. *Journal of Orthopaedic Surgery and Research*, *14*(1), 186. https://doi.org/10.1186/s13018-019-1232-8

Blomberg, A. C., Lindwall, L., & Bisholt, B. (2022). Operating theatre nurses' with managerial responsibility: Self-reported clinical competence and need of competence development in perioperative nursing. *Nursing open*, *9*(1), 692-704.

Blöndal, K., Sveinsdóttir, H., & Ingadottir, B. (2022). Patients' expectations and experiences of provided surgery-related patient education: A descriptive longitudinal study. *Nursing open*, *9*(5), 2495-2505.

Britnell, M. (2011). The role of the 'specialist'in healthcare. *Clinical Medicine*, *11*(4), 329. https://pmc.ncbi.nlm.nih.gov/articles/PMC5873739/pdf/clinmed-11-4-329.pdf

Brumm, J. (2004). Baylor Operating Room: Past, Present, Future. *Proceedings - Baylor University. Medical Center*, *17*(1), 83-88. https://doi.org/10.1080/08998280.2004.11927960

Buchan, J., & Catton, H. (2023). *Investing in the nursing workforce for health system effectiveness*. I. C. o. Nurses.

Buchan, J., Catton, H., & Shaffer, F. (2022). Sustain and retain in 2022 and beyond. *Int. Counc. Nurses*, *71*, 1-71.

Caseiro, J., & Meneses, R. (2019). Is silo mentality relevant in healthcare? The healthcare professional's view. *Proceedings of the STRATEGICA*, 636.

Castledine, G. (1992). Theatre nursing: isolated or integrated? *British Journal of Nursing*, *1*(11), 569-569.

Causby, B., Jakimowicz, S., & Levett-Jones, T. (2024). Upskill training and preparedness of non-critical-care registered nurses deployed to intensive care units during the COVID-19 pandemic: A scoping review. *Australian critical care*, *37*(5), 790-804. https://doi.org/10.1016/j.aucc.2024.02.003

Celestin, M., & Vanitha, N. (2017). Breaking down silos: Collaborative strategies that actually work. *International Journal of Applied and Advanced Scientific Research*, *2*(2), 391-397.

Chan, S. L., Zhang, A. Y., Lam, S. S. W., Rao, V., Kanagalingam, D., Tan, H. K., Chow, P. K. H., & Mathur, S. (2024). The impact of elective surgery postponement during COVID-19 on emergency bellwether procedures in a large tertiary centre in Singapore. *International journal for quality in health care*, *36*(1). https://doi.org/10.1093/intqhc/mzae022

Chellam Singh, B., & Arulappan, J. (2023). Operating Room Nurses' Understanding of Their Roles and Responsibilities for Patient Care and Safety Measures in Intraoperative Practice. *SAGE Open Nursing*, *9*, 23779608231186247. https://doi.org/10.1177/23779608231186247

Cheraghi, R., Ebrahimi, H., Kheibar, N., & Sahebihagh, M. H. (2023). Reasons for resistance to change in nursing: an integrative review. *BMC Nursing*, *22*, 1-9. https://doi.org/https://doi.org/10.1186/s12912-023-01460-0

Chiarenza, A. (2012). Developments in the concept of cultural competence. *Inequalities in health care for migrants and ethnic minorities*, *2*, 66-81.

Cilliers, F., & Greyvenstein, H. (2012). The impact of silo mentality on team identity: An organisational case study. *SA Journal of Industrial Psychology*, *38*(2), e1-e9. https://doi.org/10.4102/sajip.v38i2.993

Clemons, B. (1976). Lister's day in America. *AORN Journal*, *24*(1), 43-51. https://doi.org/https://doi.org/10.1016/S0001-2092(07)64628-6

Cohen, D. J., & Crabtree, B. F. (2008). Evaluative criteria for qualitative research in health care: controversies and recommendations. *The Annals of Family Medicine*, *6*(4), 331-339.

College of Operating Department Practitioners. (2021). History of the College of Operating Department Practitioners and the ODP Profession.

Creswell, J. (2023). *Research design : qualitative, quantitative, and mixed methods approaches.* (6th ed.). Sage.

Creswell, J. W., & Creswell, J. D. (2018). *Research design : qualitative, quantitative, and mixed methods approaches* (Fifth edition. ed.). SAGE Publications, Inc.

Cross, T. L. (1989). Towards a culturally competent system of care: A monograph on effective services for minority children who are severely emotionally disturbed.

Cumming, J. (2022). Going hard and early: Aotearoa New Zealand's response to Covid-19. *Health Economics, Policy and Law*, *17*(1), 107-119.

Curry, L., & Nunez-Smith, M. (2014). *Mixed methods in health sciences research: A practical primer* (Vol. 1). Sage publications.

Deci, E. L., & Ryan, R. M. (2013). *Intrinsic motivation and self-determination in human behavior*. Springer Science & Business Media.

Desebbe, O., Lanz, T., Kain, Z., & Cannesson, M. (2016). The perioperative surgical home: An innovative, patient-centred and cost-effective perioperative care model. *Anaesthesia critical care & pain medicine*, *35*(1), 59-66. https://doi.org/10.1016/j.accpm.2015.08.001

Dias, P., Clerc, D., Da Rocha Rodrigues, M. G., Demartines, N., Grass, F., & Hübner, M. (2022). Impact of an operating room nurse preoperative dialogue on anxiety, satisfaction and early postoperative outcomes in patients undergoing major visceral surgery—A single center, open-label, randomized controlled trial. *Journal of clinical medicine*, *11*(7), 1895.

Dingwall, R., Rafferty, A. M., & Webster, C. (1988). *An Introduction to the Social History of Nursing* (1st edition. ed.). Routledge. https://doi.org/10.4324/9780203403310

dos Santos, B. M. O., Labriola, C., Moreira, S. G. B. d. S., de Souza, H. A. N., & Porto, F. (2023). Nursing, history, and orthopedics in manuals (1875-1928) [Enfermagem, historia e ortopedia nos manuais (1875-1928) Enfermería, historia y ortopedia en manuales (1875-1928)]. *Revista Brasileira de Enfermagem*, *76*(5), 1-8. https://doi.org/https://doi.org/10.1590/0034-7167-2022-0567

Durie, M. (2011). Indigenizing mental health services: New Zealand experience: The Personal and the Professional: The Lives and Careers of Cultural Psychiatrists. *Transcultural psychiatry*, *48*(1-2), 24-36.

Earl-Babbie, M. (2013). The Practice of Social Research. *Wadsworth, Thomson Learning Inc.*

Ebohon, J., Obas, S. G., Abiodun, S., Obas, J., & Olawale, T. (2021). Understanding Research Paradigm in Social Sciences: A Critique of Two Papers on Critical Success Factors for BIM Implementation. 1. *London and Nigeria.*

Ergin, E., Karaarslan, D., Şahan, S., & Bingöl, Ü. (2023). Can artificial intelligence and robotic nurses replace operating room nurses? The quasi-experimental research.

Journal of Robotic Surgery, *17*(4), 1847-1855. https://doi.org/10.1007/s11701-023-01592-0

Farchi, T., Dopson, S., & Ferlie, E. (2023). Do We Still Need Professional Boundaries? The multiple influences of boundaries on interprofessional collaboration. *Organization Studies*, *44*(2), 277-298. https://doi.org/10.1177/01708406221074146

Filip, R., Gheorghita Puscaselu, R., Anchidin-Norocel, L., Dimian, M., & Savage, W. K. (2022). Global Challenges to Public Health Care Systems during the COVID-19 Pandemic: A Review of Pandemic Measures and Problems. *Journal of personalized medicine*, *12*(8), 1295. https://doi.org/10.3390/jpm12081295

Gan, I. (2020). A scoping review of the nursing workforce's changing demography: Supporting Baby-Boomer nurses. *Journal of nursing management*, *28*(7), 1473-1480. https://doi.org/10.1111/jonm.13132

George, J. E., Larmer, P. J., & Kayes, N. (2019). Learning from those who have gone before: strengthening the rural allied health workforce in Aotearoa New Zealand. *Rural and Remote Health*, *19*(3), 1-1.

Glarcher, M., & Vaismoradi, M. (2024). A systematic integrative review of specialized nurses' role to establish a culture of patient safety: A modelling perspective. *Journal of Advanced Nursing*. https://doi.org/10.1111/jan.16105

Gnanlet, A., McDermott, C., & Yayla-Kullu, M. (2023). Impact of workforce flexibility on operating costs: Empirical evidence from healthcare. *Journal of Asia-Pacific Business*, *24*(4), 236-253.

Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. *Handbook of qualitative research*, *2*(163-194), 105.

Hamlin, L. (2020). From theatre to perioperative: A brief history of early surgical nursing. *Journal of perioperative nursing*, *33*(4), 19-24.

Hampp, E. L., Chughtai, M., Scholl, L. Y., Sodhi, N., Bhowmik-Stoker, M., Jacofsky, D. J., & Mont, M. A. (2019). Robotic-arm assisted total knee arthroplasty demonstrated greater accuracy and precision to plan compared with manual techniques. *The journal of knee surgery*, *32*(03), 239-250.

Hampton, R., Outten, C. E., Street, L., Miranda, S., Koirala, B., Davidson, P. M., & Hager, D. N. (2023). Expedited upskilling of intermediate care nurses to provide critical care during the COVID-19 pandemic. *Nursing open*, *10*(3), 1767-1775. https://doi.org/10.1002/nop2.1433

Hartley, H., Dunning, A., Dunn, M., Grange, A., Murray, J., Simms-Ellis, R., Unsworth, K., Marran, J., & Lawton, R. (2024). Managing nurse redeployment during the Covid-19 pandemic, lessons for future redeployment: A qualitative study. *International Journal of Nursing Studies*, *157*, 104828. https://doi.org/https://doi.org/10.1016/j.ijnurstu.2024.104828

Health New Zealand Te Whatu Ora. (2025). *Patient blood management — Waikato*. Health New Zealand Te Whatu Ora,. Retrieved 22/05 from https://info.health.nz/locations/waikato/patient-blood-management

Health New Zealand, T. W. O. (2023). *The Te Whatu Ora and Te Aka Whai Ora Health Workforce Plan 2023/24*. T. W. O. Health New Zealand.

Inman, R. R., Blumenfeld, D. E., & Ko, A. (2005). Cross-Training Hospital Nurses to Reduce Staffing Costs. *Health Care Management Review*, *30*(2), 116-125. http://www.jstor.org.ezproxy.waikato.ac.nz/stable/44951191

International Council of Nurses. (2021). International Council of Nurses Issues White Paper Entitled 'The Global Nursing Shortage and Nurse Retention'. Retrieved 9/03/2025, from

Irshaidat, R. (2022). Interpretivism vs. Positivism in Political Marketing Research. *Journal of political marketing*, *21*(2), 126-160. https://doi.org/10.1080/15377857.2019.1624286

Jacobsen, M. F., Konge, L., Alberti, M., La Cour, M., Park, Y. S., & Thomsen, A. S. S. (2020). Robot-assisted vitreoretinal surgery improves surgical accuracy compared with manual surgery: a randomized trial in a simulated setting. *Retina*, *40*(11), 2091-2098.

Jefferies, S., French, N., Gilkison, C., Graham, G., Hope, V., Marshall, J., McElnay, C., McNeill, A., Muellner, P., Paine, S., Prasad, N., Scott, J., Sherwood, J., Yang, L., & Priest, P. (2020). COVID-19 in New Zealand and the impact of the national response: a descriptive epidemiological study. *The Lancet Public Health*, *5*(11), e612-e623. https://doi.org/https://doi.org/10.1016/S2468-2667(20)30225-5

Johnson, R. B., Onwuegbuzie, A. J., & Turner, L. A. (2007). Toward a Definition of Mixed Methods Research. *Journal of mixed methods research*, *1*(2), 112-133. https://doi.org/10.1177/1558689806298224

Johnston, M. (2025). Perioperative models of care. *Medicine*, *53*(1), 1-4. https://doi.org/https://doi.org/10.1016/j.mpmed.2024.10.011

Kathryn, R. (2019). *Interactional Studies of Qualitative Research Interviews* [Book]. John Benjamins Publishing Company. http://wintec.idm.oclc.org/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=nlebk&AN=2041433&site=eds-live&scope=site

Kaur, A. (2020). *She cross-trains nurses so they would be more adept at providing critical care*. Singapore General Hospital. Retrieved 05/06 from https://www.sgh.com.sg/news/tomorrows-medicine/she-cross-trains-nurses-so-they-would-be-more-adept-at-providing-critical-care

Kumar, A., & Praveenakumar, S. (2025). *Research methodology*. Authors Click Publishing.

Kumari, S., Reddy, B. S. C., Malik, Y., & Math, S. B. (2024). Super-Speciality in India: A Boon or Bane? *Indian Journal of Community Medicine*, *49*(4). https://journals.lww.com/ijcm/fulltext/2024/49040/super_speciality_in_india__a_boon_or_bane_.3.aspx

Kurup, C., Burston, A. S., Betihavas, V., & Jacob, E. R. (2024). The perspectives of internationally qualified nurses regarding their specialty skill transition to Australia: A cross-sectional survey. *Journal of Advanced Nursing*, *80*(5), 1868-1881.

Kurylo, A. (2016). Exploring the Implications of Researcher Identity and Bias on the Research Process. *Negotiating Group Identity in the Research Process: Are You In or Are You Out*, *3*.

Kuthan, C., Jackem, D., & Williams, A. (2016). Perioperative cross-training: Improving patient care flow and satisfaction. *Journal of PeriAnesthesia Nursing*, *31*(4), e7.

Laflamme, L. L. (2017). ENHANCING PERIOPERATIVE PATIENT SAFETY: A COLLECTIVE RESPONSIBILITY. *ORNAC journal*, *35*(4), 13-56. https://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,sso&db=cul&AN=128698177&authtype=sso&custid=s4804380&site=ehost-live&custid=s4804380

Land, L., & Harvey, M. (2021). Research Methods for Nurses and Midwives: Theory and Practice. *Research Methods for Nurses and Midwives*, 1-100.

Lau, R. S., Boesen, M. E., Richer, L., & Hill, M. D. (2024). Siloed mentality, health system suboptimization and the healthcare symphony: a Canadian perspective. *Health Research Policy and Systems*, *22*(1), 87.

Leavy, P. (2017). *Research Design: Quantitative, Qualitative, Mixed Methods, Arts-Based, and Community-Based Participatory Research Approaches* (1 ed.). Guilford Publications.

Lim, W. M., Kumar, S., & Ali, F. (2022). Advancing knowledge through literature reviews: 'what', 'why', and 'how to contribute'. *The Service industries journal.*, *42*(7-8), 481-513. https://doi.org/10.1080/02642069.2022.2047941

Lindwall, L., & Von Post, I. (2009). Continuity created by nurses in the perioperative dialogue - a literature review. In *Scand J Caring Sci* (Vol. 23, pp. 395-401). Oxford, UK: Blackwell Publishing Ltd.

LoBiondo-Wood, G., Haber, J., & Berry, C. (2021). *Study guide for nursing research-e-book: methods and critical appraisal for evidence-based practice*. Elsevier Health Sciences.

Longmore, M. (2024). Nurses concerned over leap in competencies proposed by Nursing Council. *Nursing New Zealand (Wellington, N.Z. : 1995)*, 1-3.

Luce, M. (1901). The Duties of an Operating-Room Nurse (Concluded). *The American Journal of Nursing*, *1*(7), 471-473. https://doi.org/10.2307/3402029

Luck, E. S., & Gillespie, B. M. (2017). Technological Advancements in the OR: Do We Need to Redefine Intraoperative Nursing Roles? *AORN Journal*, *106*(4), 280-282. https://doi.org/10.1016/j.aorn.2017.08.012

Mahajan, M. (2021). Casualties of preparedness: the Global Health Security Index and COVID-19. *International journal of law in context*, *17*(2), 204-214. https://doi.org/10.1017/S1744552321000288

Maksimovic, J., & Evtimov, J. (2023). Positivism and post-positivism as the basis of quantitative research in pedagogy [Journal Article]. *Research in Pedagogy*, *13*(1), 208-218. https://doi.org/10.5937/IstrPed2301208M

Mardell, A. (1998). How theatre nurses perceive their role: A study. *Nursing Standard (through 2013)*, *13*(9), 45-47. https://ezproxy.waikato.ac.nz/login?url=https://www.proquest.com/scholarly-journals/how-theatre-nurses-perceive-their-role-study/docview/219821292/se-2?accountid=17287

https://waikato.primo.exlibrisgroup.com/openurl/64WAIKATO_INST/64WAIKATO?url_ver=Z39.88-2004&rft_val_fmt=info:ofi/fmt:kev:mtx:journal&genre=article&sid=ProQ:ProQ%3Ahealthcompleteshell&atitle=How+theatre+nurses+perceive+their+role%3A+A+study&title=Nursing+Standard+%28through+2013%29&issn=00296570&date=1998-11-18&volume=13&issue=9&spage=45&au=Mardell%2C+Andy&isbn=&jtitle=Nursing+Standard+%28through+2013%29&btitle=&rft_id=info:eric/9923345&rft_id=info:doi/

Masters-Awatere, B., Cormack, D., Graham, R., & Brown, R. (2020). Observations by and Conversations with Health Workers and Hospital Personnel Involved in Transferring Māori Patients and Whānau to Waikato Hospital in Aotearoa New Zealand. *International Journal of Environmental Research and Public Health*, *17*(23).

Masters-Awatere, B., Howard, D., & Young, P. (2023). Haumanu Hauora: refining public health institution policy to include Māori and climate change. *Climatic Change*, *176*(5), 58. https://doi.org/10.1007/s10584-023-03534-z

Mayes, C. G. P. R. N. N. B. C., & Cochran, K. P. R. N. C. (2023). Factors Influencing Perioperative Nurse Turnover: A Classic Grounded Theory Study. *AORN Journal*, *117*(3), 161-174. https://doi.org/10.1002/aorn.13880

Mazey, S., & Richardson, J. (2020). Lesson-Drawing from New Zealand and Covid-19: The Need for Anticipatory Policy Making. *The Political Quarterly*, *91*(3), 561-570. https://doi.org/https://doi.org/10.1111/1467-923X.12893

McGarvey, H. E., Chambers, M. G. A., & Boore, J. R. P. (2000). Development and definition of the role of the operating department nurse: a review. *Journal of Advanced Nursing*, *32*(5), 1092-1100. https://doi.org/https://doi.org/10.1046/j.1365-2648.2000.01578.x

Mills, V., Keene, L., Roberts, J., & Wild, H. (2024). The cost of everything and the value of nothing: New Zealand's underinvestment in health. *The New Zealand Medical Journal (Online)*, *137*(1601), 9-13.

Ministry of Health. (2024a). *Improving the financial performance of Health New Zealand.*

Ministry of Health. (2024b). *Nursing Council: Changes to OSCE, distribution of new nurses, and New*

Zealand as a potential stepping stone to Australia

Ministry of Health. (2025). *Shorter wait times for elective treatment*. Retrieved 01/07/2025 from https://www.dpmc.govt.nz/sites/default/files/2025-06/gt-factsheet-target-1-mar25.pdf

Ministry of Justice. (2019). *Hauora Wai 2575 Waitangi Tribunal Report*. N. Z. M. of & Justice. https://www.health.govt.nz/publications/wai-2575-maori-health-trends-report

Mitchell, S., Stewart, C., & Campbell, C. (2020). Southern Cross Hospitals' Registered Nurse Anaesthetic Assistant Programme. *The Dissector*, *48*(3), 32-33.

Mohanasundari, S. K., Kalpana, M., Madhusudhan, U., Vasanthkumar, K., B, R., Singh, R., Vashishtha, N., & Bhatia, V. (2023). Can Artificial Intelligence Replace the Unique Nursing Role? *Cureus*. https://doi.org/10.7759/cureus.51150

Nassaji, H. (2020). Good qualitative research. In (Vol. 24, pp. 427-431): SAGE Publications Sage UK: London, England.

Nelson, S., & Rafferty, A. M. (2012). *Notes on Nightingale: The Influence and Legacy of a Nursing Icon* (Epub edition ed.). Cornell University Press. https://doi.org/10.7591/9780801460241

New Zealand Nurses Organisation. (2017). Internationally qualified nurses: Immigration and other issues. In.

Nightingale, K. (2000). The past as prologue to the future. *British Journal of Perioperative Nursing*, *10*(7), 354. https://ezproxy.waikato.ac.nz/login?url=https://www.proquest.com/scholarly-journals/past-as-prologue-future/docview/217770659/se-2?accountid=17287

https://waikato.primo.exlibrisgroup.com/openurl/64WAIKATO_INST/64WAIKATO?url_ver=Z39.88-2004&rft_val_fmt=info:ofi/fmt:kev:mtx:journal&genre=article&sid=ProQ:ProQ%3Ahealthcompleteshell&atitle=The+past+as+prologue+to+the+future&title=British+Journal+of+Perioperative+Nursing&issn=14671026&date=2000-07-01&volume=10&issue=7&spage=354&au=Nightingale%2C+Kate&isbn=&jtitle=British+Journal+of+Perioperative+Nursing&btitle=&rft_id=info:eric/&rft_id=info:doi/

Nuclear Threat Institute and Johns Hopkins. (2020). *Welcome to the 2019 Global Health Security Index. GHS. .* https://www.ghsindex.org/

Nursing Council of New, Z. (2007). Competencies for Registered nurses [2016]. 2. file:///Users/murraymacdonald/Downloads/NCNZ006-Competencies-Registered-Nurses-15-08-2022v0.1pdf.pdf (2012)

Nursing Council of New Zealand. (2022). Competencies for Registered Nurses. In. Wellington: Nursing Council of New Zealand.

Nursing Council of New Zealand. (2023). *Nursing Council implements IQN competence assessment changes*. Nursing Council of New Zealand. Retrieved 11/03/2025 from https://www.nursingcouncil.org.nz/IQN/IQN_News/Nursing-Council-implements-IQN-competence-assessment-changes.aspx

Nursing Council of New Zealand. (2024). *Nursing Council of New Zealand Quarterly Data Report*. N. C. o. N. Zealand.

Nursing Council of New Zealand. (2025a). Registered nurse scope of practice. In: Nursing Council of New Zealand.

Nursing Council of New Zealand. (2025b). Standards of competence for registered nurses. In *Standards of competence for registered nurses*. Wellington: Nursing Council of New Zealand.

Office of the Minister for Covid-19 Response. (2022). *Reducing Management Isolation Stays for Border Arrivals from*

14 to 9 or 10 Days. Ministry of Business Innovation and Employment Retrieved from https://www.mbie.govt.nz/search/SearchForm?Search=14+days+isolation

Oren, O., Gersh, B. J., & Bhatt, D. L. (2020). On the Pearls and Perils of Sub-Subspecialization. *The American Journal of Medicine*, *133*(2), 158-159. https://doi.org/10.1016/j.amjmed.2019.06.052

Organisation for Economic Co-operation and Development (OECD). (2023). *Health at a glance 2023: OECD indicators*. .

Pagano, L., Long, J. C., Francis-Auton, E., Hirschhorn, A., Arnolda, G., Braithwaite, J., & Sarkies, M. N. (2025, 2025/02/04/). A qualitative study of how clinicians reach agreement in perioperative pathway development: the Consensus Model for Standardising Healthcare. *Implementation Science Communications*, *6*(1). http://dx.doi.org.ezproxy.waikato.ac.nz/10.1186/s43058-025-00699-9

Pandit, J. J. (2018). *Practical operating theatre management: measuring and improving performance and patient experience*. Cambridge university press.

Parliament of New Zealand. (2003). *Health Practitioners Competence Assurance Act 2003*. 2004: Parliament of New Zealand

Passarelli, A. M., & Kolb, D. A. (2023). Experiential Learning Theory. *Student Learning Abroad: What Our Students Are Learning. What They're Not, and What We Can Do About It*.

Pattison, N., & Corser, R. (2023). Compassionate, collective or transformational nursing leadership to ensure fundamentals of care are achieved: A new challenge or non-sequitur? *Journal of Advanced Nursing (John Wiley & Sons, Inc.)*, *79*(3), 942-950. https://doi.org/10.1111/jan.15202

Perioperative Nurses College. (n.d). *Resources for perioperative nurses: PNC knowledge and skills framework*. Perioperative Nurses College. Retrieved 27/05/2025 from https://www.nzno.org.nz/groups/colleges_sections/colleges/perioperative_nurses_college/resources

Phua, Y. L., Elizabeth, Soh, L., Ling , & Tan, H., Ling. (2023). *Operating theatre nurse's cross training to enhance manpower deployment*. Singapore Health Care Management 2023. Retrieved 6/5/2025 from https://www.singaporehealthcaremanagement.sg/Documents/Poster%20Competition%202023/Human%20Resource/SHM_HR017%20-%20Phua%20Yu%20Ling%20Elizabeth_SNEC%20-%20Operating%20Theatre%20Nurses%20Cross%20Training%20to%20Enhance%20Manpower%20Deployment.pdf

Platt, M. S., Coventry, T., & Monterosso, L. (2019). Perioperative nurses' perceptions of cross-training: A qualitative descriptive study. *Journal of perioperative nursing*, *32*(1), 19-25. https://doi.org/10.26550/2209-1092.1042

Pulkkinen, M. (2021). A new practice model to organize perioperative nursing care

Pulkkinen, M., Jousela, I., Sintonen, H., Engblom, J., Salanterä, S., & Junttila, K. (2021). A randomized clinical trial of a new perioperative practice model on anxiety and health-related quality of life in arthroplasty patients. *Nursing open*, *8*(4), 1593-1605.

Pulkkinen, M., Junttila, K., & Lindwall, L. (2016). The perioperative dialogue - a model of caring for the patient undergoing a hip or a knee replacement surgery under spinal anaesthesia. *Scandinavian journal of caring sciences*, *30*(1), 145-153. https://doi.org/10.1111/scs.12233

Quinn, R. (2024). *Thousands of NZ nurses register to work in Australia* https://www.rnz.co.nz/news/national/509623/thousands-of-nz-nurses-register-to-work-in-australia#:%E2%88%BC:text=More%20than%209000%20New%20Zealand,boost%20in%20pay%20last%20year

Ram, F. S. F., McDonald, E. M., Kuttan, A., & Sudarsan, I. (2025a). Nursing Brain Drain, How Do We Retain Our Internationally Qualified Nurses: A Close Examination of Push and Pull Factors. *Policy, politics & nursing practice*, 15271544251314338. https://doi.org/10.1177/15271544251314338

Ram, F. S. F., McDonald, E. M., Kuttan, A., & Sudarsan, I. (2025b). Nursing Brain Drain, How Do We Retain Our Internationally Qualified Nurses: A Close Examination of Push and Pull Factors. *Policy, Politics, & Nursing Practice*, 15271544251314338.

Rehman, A. A., & Alharthi, K. (2016). An introduction to research paradigms. *International Journal of Educational Investigations*, *3*(8), 51-59.

Reweti, A. (2023a). Understanding how whānau-centred initiatives can improve Māori health in Aotearoa New Zealand. *Health promotion international*, *38*(4). https://doi.org/10.1093/heapro/daad070

Reweti, A. (2023b). Understanding how whānau-centred initiatives can improve Māori health in Aotearoa New Zealand. *Health promotion international*, *38*(4), daad070. https://doi.org/10.1093/heapro/daad070

Saafin, A. (2024). *'It's just better' – Why Kiwi nurses are moving to Australia.* https://www.1news.co.nz/2024/07/17/its-just-better-why-kiwi-nurses-are-moving-to-australia/#:%E2%88%BC:text=In%20the%20year%20ending%20March,over%20to%20Australia%20quite%20easily.%22

Saleh, H., Abbas, Z., Latif, N., & Khalil, Z. (2024). Agile Management in Healthcare Improving Patient Outcomes through Flexibility and Responsiveness. *Journal of Ecohumanism*, *3*, 633-649. https://doi.org/10.62754/joe.v3i5.3928

Saletnik, L. (2018). Technology in the Perioperative Environment. *AORN Journal*, *108*(5), 488-490. https://doi.org/10.1002/aorn.12414

Schonborn, J. L., & Anderson, H. (2019). Perioperative medicine: a changing model of care. *BJA Education*, *19*(1), 27-33. https://doi.org/10.1016/j.bjae.2018.09.007

Shamasunder, S., Holmes, S. M., Goronga, T., Carrasco, H., Katz, E., Frankfurter, R., & Keshavjee, S. (2020). COVID-19 reveals weak health systems by design: Why we must re-make global health in this historic moment. *Global public health*, *15*(7), 1083-1089. https://doi.org/10.1080/17441692.2020.1760915

Shields, L., & Watson, R. (2007). The demise of nursing in the United Kingdom: A warning for medicine. *Journal of the Royal Society of Medicine*, *100*(2), 70-74. https://doi.org/10.1258/jrsm.100.2.70

Sileyew, K. J. (2019). *Research design and methodology* (Vol. 7). Cyberspace London.

Sitta Martins, B., Moreira Corgozinho, M., & de Andrade Antunes Gomes, J. R. (2023). Nurses' perceived challenges in managing perioperative care: a qualitative study. *Revista SOBECC*, *28*, 1-7. https://doi.org/10.5327/Z1414-4425202328862

Smith, J., & Palesy, D. (2018). Technology stress in perioperative nursing: An ongoing concern [Journal Article]. *Journal of perioperative nursing*, *31*(2), 25-28. https://search.informit.org/doi/10.3316/informit.944852097101865

https://search.informit.org/doi/full/10.3316/informit.944852097101865

Smith, K. A. (2012). Louis pasteur, the father of immunology? *Frontiers in immunology*, *3*, 68-68. https://doi.org/10.3389/fimmu.2012.00068

Suganandam, D. (2019). Pre-intra-post-operative nursing care pathway: Fragments to fusion, isolation to integration [Article]. *Indian Journal of Continuing Nursing Education*, *20*, 87. https://link-gale-com.ezproxy.waikato.ac.nz/apps/doc/A629351165/AONE?u=waikato&sid=bookmark-AONE&xid=85f18f71

Suganandam, D. K. (2019). Pre-Intra-Post-Operative Nursing Care Pathway: Fragments to Fusion, Isolation to Integration. *Indian Journal of Continuing Nursing Education*, *20*(2). https://journals.lww.com/ijcn/fulltext/2019/20020/pre_intra_post_operative_nursing_care_pathway_.2.aspx

Suganandam, K. (2019). Pre-Intra-Post-Operative Nursing Care Pathway: Fragments to Fusion, Isolation to Integration. *Indian Journal of Continuing Nursing Education*, *20*(2). https://journals.lww.com/ijcn/fulltext/2019/20020/pre_intra_post_operative_nursing_care_pathway_.2.aspx

Tang, C. J., Lin, Y. P., & Chan, E. Y. (2021). 'From expert to novice', perceptions of general ward nurses on deployment to outbreak intensive care units during the COVID-19 pandemic: A qualitative descriptive study. *Journal of Clinical Nursing*.

TE KŌMIHANA, W. H. O. A. (2022). COLONISATION, RACISM AND WELLBEING. In.

Te Whatu Ora – Health New Zealand. (2023). *2023. Health Workforce Plan 2023-24*.

Te Whatu Ora Health New Zealand. (2021). *Elective services patient flow indicators Web Tool*. Ministry of Health. Retrieved 19/08/2023 from https://tewhatuora.shinyapps.io/ESPI_app/

Theocharis, L., Sanoudou, D., Protogerou, A., Laios, K., Androutsos, G., & Karamamou, M. (2024). Louis Pasteur (1822–1895), Ignaz Semmelweis (1818–1865), Joseph Lister (1827–1912) and the Link Between Their Works Toward the Development of Antisepsis: A Narrative Review. *Cureus*, *16*(6). https://doi.org/https://doi.org/10.7759/cureus.62543

Tredinnick, L. (2017). Artificial intelligence and professional roles. *Business Information Review*, *34*(1), 37-41.

Tsujita, Y., Oda, H., & Rajan, S. I. (2023). Obtaining a Nursing Job in Australia and New Zealand: A Case Study of Migrant Nurses Trained in India. *ERIA Research Project Report FY 2023, No. 07*, 47.

Vaughn, L. M., & Jacquez, F. (2020). participatory Research Methods – Choice Points in the Research Process. . *journal of Participatory Research Methods,*.

Vine, M., Joseph, K., Gibson, D., Lim, B., Chua, M., Siu, A. H. Y., Dooreemeah, D., Lee, A., Cuomo, R., & Seth, I. (2024). Innovative approaches to preoperative care including feasibility, efficacy, and ethical implications: a narrative review. *AME Surgical Journal*, *4*. https://asj.amegroups.org/article/view/82554

Waikato, T. W. O. H. N. Z. (2022). *Snapshot of health New Zealand-Waikato*. Te Whatu Ora Health New Zealand Waikato. Retrieved 12 February 2025 from https://www.waikatodhb.health.nz/about-us/snapshot-of-waikato-dhb/

Wang, F., Yuan, L., Xiong, Z.-Z., & Li, R. (2016). Research progress in nursing subspecialization. *Chinese Nursing Research*, *3*(3), 121-124. https://doi.org/https://doi.org/10.1016/j.cnre.2016.10.002

Wang, R., Huang, X., Wang, Y., & Akbari, M. (2022). Non-pharmacologic Approaches in Preoperative Anxiety, a Comprehensive Review. *Frontiers in Public Health*, *10*. https://doi.org/10.3389/fpubh.2022.854673

Weston, M. J. (2022). Strategic Planning for a Very Different Nursing Workforce. *Nurse Leader*, *20*(2), 152-160. https://doi.org/https://doi.org/10.1016/j.mnl.2021.12.021

Williams, C. (2022). Perioperative nursing – exclusive or inclusive? *ACORN*, *35*(1), E23-E25. https://ezproxy.waikato.ac.nz/login?url=https://www.proquest.com/trade-journals/perioperative-nursing-exclusive-inclusive/docview/2827986576/se-2?accountid=17287

https://waikato.primo.exlibrisgroup.com/openurl/64WAIKATO_INST/64WAIKATO?url_ver=Z39.88-2004&rft_val_fmt=info:ofi/fmt:kev:mtx:journal&genre=unknown&sid=ProQ:ProQ%3Anahs&atitle=Perioperative+nursing+%26ndash%3B+exclusive+or+inclusive%3F&title=ACORN&issn=14487535&date=2022-10-01&volume=35&issue=1&spage=E23&au=Williams%2C+Carollyn&isbn=&jtitle=ACORN&btitle=&rft_id=info:eric/&rft_id=info:doi/

Wilson, N., Barnard, L. T., & Baker, M. (2020). *Rationale for border control interventions and options to prevent or delay the arrival of Covid-19 in New Zealand: Final commissioned report for the New Zealand Ministry of Health*. Ministry of Health.

Zemmar, A., Lozano, A. M., & Nelson, B. J. (2020). The rise of robots in surgical environments during COVID-19. *Nature Machine Intelligence*, *2*(10), 566-572.

Zipporah, J. V. (2024). Addressing Nursing Shortages: A Universal Imperative. *AJOMN-American Journal of Obstetric and Maternal Nursing*, *1*(1).

Zyphur, M. J., & Pierides, D. C. (2020). Making Quantitative Research Work: From Positivist Dogma to Actual Social Scientific Inquiry. *Journal of business ethics*, *167*(1), 49-62. https://doi.org/10.1007/s10551-019-04189-6