



THE IMPACTS OF NURSING INDUCTION PROGRAMMES (IPs) ON NEWLY-
JOINED NURSES (NJNs) IN SINGAPORE OPERATING ROOMS (ORs): A MIXED-
METHODS STUDY

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Abstract

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Muhammad Kai Ibrahim Ergo Bin Mohamad Azmi

Unicaf University

Challenges faced by Singapore operating room (OR) nurses with current induction programmes (IPs) for newly-joined nurses (NJNs) lack acknowledgements. Trying to compress the knowledge and skills of perioperative nursing into NJNs OR IPs within a few weeks was not feasible as such knowledge and skills require months and years of training to be attained and proficient. Thus, these challenges has impacted OR NJNs' ability to establish the standard of care provided to patients according to standards set by the Singapore Nursing Board (SNB). Acting on what was best known through previous and current knowledge and correcting based on the hospitals' policies might be traumatising to new professional nurses. It might result in patient harm and unintended industrial-related stress. The purpose of this study was to explore the challenges that Singapore OR NJNs faced with their IPs that later impacted them in their job roles. Benner's *'From Novice to Expert'* theory and Warren and Mills's *'Conceptual Model of Nursing Motivation'* was used to guide the exploration of the research topic.

The explanatory sequential mixed-methods design was adopted to bridge the findings of the mixed-methods study, which involved a cohort study design for the quantitative phase and a phenomenology study design for the qualitative phase. 91 NJNs were recruited for the

quantitative study and 8 NJNs for the qualitative study to explore the central question of impacts faced by Singapore's NJNs with their OR nursing IP received. Braun and Clarke's six-step thematic analysis was utilised to transcribe the verbatim data for the qualitative study, and IBM SPSS Version 28.0.1.1 to analyse the quantitative data.

Findings from both studies were compared to provide research triangulation and robustness of conclusions aided in avoiding the enmesh of affirmation bias by applying more than one element for comparison. The study has outlined challenges NJNs face that have impacted their ability to function in their job roles. Hence, it brought to light nursing policymakers, administrators and academic solutions to allow them to find a resolution in a collaborative effort to improve current OR nursing IPs and includes more OR nursing content in nursing school.

Declaration

I declare that this thesis has been composed solely by myself and that it has not been submitted, in whole or in part, in any previous application for a degree. Except where states otherwise by reference or acknowledgment, the work presented is entirely my own.

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Dedication

This study is whole heartedly dedicated to my partner Sam, and my family, as well as my good mate Nicholas. Thank you for all the support, encouragement and love throughout this process that you showed me when I did not believe I could make it through. To all the teachers from Unicaf University who supervised me throughout the 4 years of my journey, thank you.

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This PhD was undertaken during an unprecedented time during the SARS-CoV-2 pandemic that have put a halt to our daily living. The journey throughout this PhD has been challenging, difficult but nonetheless fulfilling, inspiring and rewarding. The quintessential question “Is theatre nursing lacking guidance for novice theatre nurses?” has resulted me to embark in this journey. The journey has been eye opening to understand the depth of challenges OR nurses faced in their daily practices that dates back to the first day they began a career in an unfamiliar nursing environment. This journey was not undertaken alone. I would like to thank the following people and organisation who have helped me made this journey possible.

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List of Abbreviations

1	unit or a constant
ACORN	Australian College of Perioperative Nurses
AORN	Association of periOperative Registered Nurses
BNC	Be Nice Champion
CCU	Critical Care Units
CN	Community Nurses
CNA	Channel News Asia
CNO	Chief Nursing Officer
CNS	Clinical Nurse Specialist
e	The Level of Significance or Limit of Tolerable Error
EFA	Exploratory Factor Analysis
EN	Enrolled Nurse
ICU	Intensive Care Unit
IOM	Institute of Medicine
IORNTSP	Impacts on Operating Room Nurses with Transitional Support Programmes
IP	Induction Programme
KMO	Kaiser-Meyer-Olkin
MCSS-26	Manchester Clinical Supervision Scale
<i>M</i>	Mean (<i>M</i>)
<i>MED</i>	Median
N.A.	Not Applicable

NGN	Newly Graduated Nurse
NHS	National Health Service
NJN	Newly-Joined Nurse
NQN	Newly Qualified Nurse
NUH	National University Hospital
NUS	National University of Singapore
NETP	Nurse Entry to Practice
ODP	Operating Department Practitioners
OP	Orientation Programme
OQN	Overseas Qualified Nurse
OR	Operating Room
OT	Operating Theatre
PEC-AUS	Practice Environment Scale Australia
PACU	Post-Anaesthesia Care Unit
PI	Pressure Injuries
PPC	Perceived Perioperative Competence
PPCS-R	Perceived Perioperative Competence Scale-Revised
Q	Question
RAS	Robotic-Assisted Surgery
RN	Registered Nurse
SEA	South East Asian
SARS-CoV-2	Severe Acute Respiratory Syndrome CoronaVirus 2
SNB	Singapore Nursing Board

<i>SD</i>	Standard Deviation
qual	Qualitative
QUAN	Quantitative
TSP	Transitional Support Programme
TSSU	Theatre Sterile Supply Unit
UK	United Kingdom
UREC	Unicaf Research Ethics Committee
WHO	World Health Organization
WPB	Workplace bullying

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CHAPTER 1: INTRODUCTION

Background

The progressive advancement in surgical practices has forced the need for nurses to advance their skills in practising theatre nursing (Smith & Palsey, 2018). It has developed issues for leaders in perioperative units as it has continued to experience the older generation of nurses exiting the workforce due to retirement and other social-work-related issues (Beitz, 2019). Thus, healthcare leaders had to be proactive in working in partnership with academia to strengthen the skills and knowledge of perioperative nursing in the face of healthcare complexity that has contributed to competency crises due to the lack of opportunity to pass on clinical skills and knowledge to novice nurses joining the operating room (OR) units (Beitz, 2019; Foran, 2015).

According to the World Health Organization (WHO) in a report shared by Channel News Asia (CNA, 2020, April 07), the issue was further worsened by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic and declared the world faced a 5.9 million global shortfalls of nurses to cater to patient care globally. Moreover, safety protocols to reduce cross infections of the SARS-CoV-2 virus have led to lesser access for nursing students to real-life practicum to prepare them for the workforce mentally (Woo et al., 2021). With such compelling evidence from the literature, healthcare organisations should not depend on approaches such as monetary incentives for nurses' recruitment and educational and professional upgrading as motivation techniques (Aldosari et al., 2021; Ning & Costello, 2017); which was commonly seen in the recruitment and retainment of nurses in Singapore (Chua, 2020). Instead, the focus should lie on improving the leaders' and followers' relationship and professional commitment by encouraging nurses to upgrade themselves with the latest skills and knowledge to understand better the progressive health issues and

demographics of today's patients (Bianchi et al., 2018; Wang et al., 2016; Wei et al., 2019). Hence, it would build nurses' ability to recognise their strengths and weaknesses in the knowledge and skills to rationalise better their career paths (Wang et al., 2016) and patient care outcomes (Wei et al., 2019).

The matter was especially crucial in OR units in Singapore hospitals, where existing induction programmes (IPs) for NJNs might not have been delivered effectively, and issues surrounding Singapore OR nursing practices among NJNs were unknown due to the matter not being investigated in the literature. Moreover, with poor retention of nursing staff still on a steep, the functionality of an effective specialist nursing IP for nursing speciality areas such as the OR unit was becoming more paramount. Therefore, it was succinct to improve the current state of the nursing workforce in the Singapore OR units. In addition, the lack of support from colleagues, high-stress levels and increased work-life imbalances have also contributed to nurses in Singapore leaving their roles (Chua, 2020; Dyess & Sherman, 2009). It occurred once they had completed serving their bond obligation implied due to hospital scholarships taken up for student nursing education fees (Woo & Newman, 2020). Hence, when elective surgeries normalised in OR units in Singapore, finding skilled nurses to meet its demands would face issues if nursing administrators and academia did not keep abreast with the updated volatile changes associated with health crises, as healthcare authors had shared in the latest literature (Prakash et al., 2020; Woo et al., 2021).

Extensive research done in the United States (US) sheds some light on what the Singapore OR nursing workforce might face if issues within its workforce were not acknowledged. For example, an online survey administered to perioperative nursing directors in 2012 indicated that 64.8% of the 256 respondents aimed to relinquish their nursing roles no later than 2022 (Sherman et al., 2014). Although only 26.6% of respondents were below

50 years old, it became a growing concern. It was especially relevant during major health crises like the SARS-CoV-2 pandemic to find people to join the nursing workforce and get them up to speed to replace those who intended to leave or had left. It concurred with another US study, where 13% of newly graduated nurses (NGNs) surveyed stated that they intended to leave the nursing workforce after a year, with another 37% planning to change their jobs in the near future (Konver et al., 2007). Other researchers explained in the literature that the main reasons for the reported phenomenon were the lack of a support system, high stress levels at work, and increased work-life imbalance (Ball et al., 2015; Beitz, 2019; Spruce, 2019). However, despite these growing concerns, many healthcare organisations have not set a succession plan to manage the problem (Doyle, 2018).

In Singapore, the issues reflected in extant literature stated that to counter the lack of Singaporeans' interest in taking up nursing as a profession, the Singapore government had ventured into recruiting nurses from neighbouring Asian countries to ensure that the nursing workforce does not suffer the same faith as its US counterparts. However, despite these active efforts to resolve the problem, exacerbating issues such as i) rapid population growth, ii) rapid ageing population, and iii) increasing trend of chronic diseases have narrowed the successful attempts of closing the gap of nursing shortages (Chan & Morrison, 2000; Chua, 2020; Lim, 2005). Thus, the issue was paramount to be addressed as nursing is a hands-on profession that would require a high level of competence to deliver its job roles (Lambert & Glacken, 2005; Pertiwi & Hariyati, 2019; Woo & Newman, 2020). Although Singapore nursing schools have seen an increased number of mature student intakes, younger school leavers who choose to explore other careers first before nursing might be lost to the Singapore healthcare industry (Liaw et al., 2017). It was because the valuable time they spent

exploring a career they later found unfulfilling could have been time used to develop their vocational skills in nursing (Liaw et al., 2017).

Furthermore, the lack of perioperative nursing exposure during student nursing due to the anachronistic nature of OR nursing with generalist nursing education, where the curriculum lacked perioperative nursing contents, did not help gear nurses for their roles in the OR (Beitz, 2019; Penprase et al., 2016). Hence, it further led nursing students not to want to select the OR as the unit to begin their nursing career after graduation (Schmidt & Brown, 2019). Furthermore, with the gaps in contingency plans to revive the nursing workforce when the SARS-CoV-2 pandemic ends and replace existing nurses planning to leave the workforce, the issues discussed needed exploration and acknowledgement. Therefore, the dissertation focused on exploring the impacts current IPs had on newly-joined nurses (NJNs) in the OR units in Singapore that were the manifestation of challenges they faced as a result of their IPs received. To understand the gaps in the issues within the Singapore OR nursing context, this chapter yielded the general background of the Republic of Singapore and the nursing profession in the republic. Within the chapter, the author would also outline the motivation to undertake the research topic through the statement of the problems. The chapter had briefly highlighted substantial current knowledge regarding the research topic. The purpose of the study, the research aims, and objectives will later be outlined, followed by the nature of the study undertaken and the presentation of research questions and hypotheses. The concern that has resulted in the study's undertaking was the impacts OR nursing IPs had on OR nurses' job roles in Singapore after undergoing IPs organised by their employer. Therefore, the study investigated the phenomenon in two phases. The chapter's continuation of the discussion provided an essential introduction for readers to immerse in the brief context of the study.

The Republic of Singapore is a densely populated country within the South East Asian (SEA) region, with a population size, as of May 2021, of 5.88 million people (World Population Review, 2021). Nursing in Singapore was first established during the British colonies in the late 1880s when untrained nuns were recruited as nurses to render care to Indian convicts in the only available hospital, the Singapore General Hospital (Lee, 2005; Loke et al., 2015). As Western cultures strongly influenced Singapore's development, its initial nursing knowledge and practices were generally influenced by Western practices such as Australia, the United Kingdom (UK), and the US (Ang & Tan, 2016; Lee, 2005; Loke et al., 2015). However, as Singapore developed its identity, nursing knowledge and practices shifted to fit its demographic health needs (Loke et al., 2015). Subsequently, nursing schools were established to advance nursing as a profession as the demand for the vocational profession increased (Goh et al., 2019; Loke et al., 2015). The first effort to professionalise nursing as a vocational profession was establishing the School of Nursing in 1956 (Loke et al., 2015). However, due to the lack of support from the Singapore government, many setbacks were faced by nursing administrators and academia in establishing proper nursing schools (Goh et al., 2019). Additionally, the conscious status society in Singapore, which initially regarded nursing as a low-grade profession, made it challenging to identify nursing as a vocational profession (Loke et al., 2015).

Nonetheless, with great perseverance, the Singapore nursing profession has established five full-time nursing schools today (Table 1). It ranged from nitec in nursing to a diploma and degree in nursing, earning them an Enrolled or Registered Nurse position respectively upon completing their courses (Chua, 2020; Goh et al., 2019). Nurses would then seek employment to serve in the hybrid healthcare system in Singapore that consisted of public and private sectors (Satku & Lee, 2016). In recent times, opportunities for nurses to

expand their nursing academics were also made available with graduate nursing programmes (Goh et al., 2019). It included master's degrees and doctoral programmes in nursing that could advance their function as a nurse to roles such as advanced practice nurses (Goh et al., 2019).

Table 1

Programmes Leading to Nursing Registration

School	Educational Certificate Attained	Registration Types	Programme Duration
Institute of Technical Education	Nitec in Nursing	Enrolled Nurse (EN)	2 years
Nanyang Polytechnic, Ngee Ann Polytechnic, Parkway College of Nursing and Allied Health Pte Ltd	Diploma in Nursing	Registered Nurse (RN)	3 years
National University of Singapore (NUS)	Bachelor in Science Nursing	Registered Nurse (RN)	3 years, 4 years (with honours)

*** Based on nursing education programmes accredited by Singapore Nursing Board (SNB).*

As the global nursing workforce continued to face issues in filling its workforce efficiently with skilled nurses (Beitz, 2019), establishing nursing professionally and

academically in Singapore was necessary to maintain the standard of care provided for patients (Woo & Newman, 2020). The five schools that were established were essential steps to establishing this journey. Amidst the SARS-CoV-2 pandemic, it became immanent that previous efforts to uphold those standards through professional and educational advancements had better-prepared nurses for such pandemics (Woo et al., 2021). These efforts to evolve nursing education required innovation (Woo et al. 2021). It included remote learning, such as using e-Learning to learn about their new job scopes and new unit (Veerapen & McKeown, 2021; Woo et al., 2021). However, as nursing researchers have shared, issues such as the continuing lack of professional commitment and development for nurses in Singapore have led to a shortage of nurses and became a noticeable causative factor for the increased in nursing turnover (Chua, 2020; Fang, 2001; Lim, 2005; Lim et al., 2013; Ning & Costello, 2017).

Additionally, the lack of passion for joining the nursing profession post-graduation (Chua, 2020; Liaw et al., 2016), an ageing workforce (Uthaman et al., 2015), and the perception of the nursing as a profession (Chua, 2020; Loke et al., 2015) has contributed to the exacerbating global shortfall of nurses in Singapore. Furthermore, the increased number of Asian nurses immigrating to Western countries has made Singapore less desirable to practice nursing even though Singapore was the more desirable country for Asian nurses to migrate to because of its high economic income status for nurses in the SEA region (Efendi et al., 2018). Benefits such as better work-life balance, higher salary, the positive perception of obtaining a job overseas and strong family networks, particularly in Western countries, have pushed nurses to immigrate to these locations (Dahl et al., 2021; Zhou et al., 2016).

Statement of the Problem

The problem the author observed from the literature was that although IPs were made available for all levels of nurses, the main question asked was whether they were delivered to succeed. Therefore, trying to compress the knowledge and skills of perioperative nursing into NJNs OR IPs within a few weeks was not feasible. Research has indicated that such knowledge and skills would require months and years of training to be attained and proficient (Ball et al., 2015). Nurses, like other vocational professions, is not just an applied profession. Nursing practice is complex and diverse and not determined by singular beliefs. Hence, theoretical nursing itself could not help nurses resolve complicated clinical issues when they arise, as each situation would present unique challenges (Arzani et al., 2016; von Vogelsang et al., 2019). Thus, nurses' actions were compounded by what was best known through previous and current knowledge and corrected based on policies of the hospitals that might be traumatising to new professional nurses. Therefore, the practice environment became less safe and might result in patient harm and unintended industrial-related stress.

Authors in nursing literature have also expressed that transitioning from a nursing student to a professional nurse was a critical stage for NGNs (Aldosari et al., 2020; Ankers et al., 2017; Odland et al., 2014). Others added that during this period, NGNs undergo stress, uncertainty and challenges that would eventually drive their decision to stay on or leave the nursing profession (Leong & Crossman, 2015; Tuckett et al., 2015; Woo & Newman, 2020). The crucial decision-making period generally fell between the first three to six months of their transitional period. Despite some variations to provide OR nurses with continuing education and life-long learning programmes (Noonan, 2011), OR nurses still face challenges in their job roles that have affected patients and other healthcare workers. Hence, resulting in more than half of NGNs leaving the profession within the first two years of entering the

profession (Strauss, 2009, as cited in Odland, 2014), even before they could have achieved the level of professional competency if they stayed on to develop it adequately (Odland, 2014). The transitional period to be a skilled OR nurse would require a more extended period than a generalist nurse who has had abundant exposure as a nursing student. Thus, it was essential to instil the correct knowledge and concept of perioperative nursing in nurses' induction to the OR units. OR nursing leaders have acknowledged its importance, but changes in the nursing workforce demographics have posed challenges to meeting these expectations (Sherman, 2014). With the lack of empirical research regarding the phenomenon, particularly in Singapore, and in the face of the global nursing shortage, it was imminent for the matter to be explored and understood for the well-being of patients and the vitality of the nursing profession.

Moreover, healthcare institutes had to make significant changes in their hospital operations amid significant health crises like the one seen during the SARS-CoV-2 pandemic. One significant change included the need for elective surgery services to be reduced or blocked momentarily so that intensive care unit (ICU) beds could be utilised and made available for SARS-CoV-2 patients (Lee et al., 2020). In addition, it was extended to turning the recovery room units of the OR units and general wards to be converted to ICUs as hospitals globally lack the capacity of beds to manage the overwhelming number of SARS-CoV-2 patients that require ICU care (Lee et al., 2020). The problem was magnified by the lack of skilled healthcare professionals with the knowledge and skills to care for pandemic patients. What further aggravated the issue was the workforce loss due to respiratory illness that forced healthcare staff to miss work for at least five days as a safety precaution (Goh et al., 2020; Lee et al., 2020). Thus, this study was imperative and opportunistic for nursing administrators and academia to explore how to effectively support current and future nurses

in their role transition and daily work responsibilities in the OR unit once elective surgical services fully resume after years in pandemics operations (Duncan, 2020).

During peacetime, researchers have explored the experience of NGNs transitioning into their new professional roles. The problem the study sought to identify was how OR nursing IPs impacted NJNs in Singapore at an individual, organisational, industry and social level. However, these studies have been limited to Western international society, causing researchers exploring nurses' transition challenges in Singapore to question its relevance to the Singapore context (Woo & Newman, 2020). Nonetheless, the findings from international literature have helped nursing researchers use it to explore issues within their community as the foundation of nursing practice was ultimately similar. Researchers expressed in the literature that transitioning professional nurses in Singapore at an individual level found that being given labels and concerns with their knowledge and skills affected them during their transition (Leong & Crossman, 2015; Woo & Newman, 2020). At the organisational level, transitional programmes were assessed for their reliability and effectiveness in delivering their objectives in the smooth transition from nursing students to professional nurses (Tan et al., 2016; Leong & Crossman, 2015; Woo & Newman, 2020). However, using harmful tools such as repatriation and repayment of bonds due to failing probation created unnecessary pressure for NJNs (Woo & Newman, 2020). At the industrial level, the efforts to portray nursing as a profession in Singapore included exposing students to healthcare work early to motivate nursing as a career option (Liaw et al., 2017). Hence, it helped change Singaporeans' perception of nursing as a low-grade profession. At a social level, a lack of appreciation and acknowledgement from patients of NJNs' effort to deliver care at their competence level has made NJNs question their worth (Tan et al., 2016; Woo & Newman, 2020). Furthermore, social cliques further created social disparity at work as NJNs felt

outcasted when they did not fit into their unit's different social group norms (Leong & Crossman, 2015; Innes & Calleja, 2018; Woo & Newman, 2020). Therefore, with the problems stated in the literature added to the fact that these issues lacked exploration within the Singapore OR nursing profession and the literature, it was valuable to explore and contribute to the literature.

Purpose of the Study, Research Aims, and Objectives

The purpose of the mixed-methods study was to explore the impacts current OR nursing IPs in Singapore had on its NJNs as a result of the challenges they faced during the IP period to better prepare nurses in providing competent OR nursing care. The mixed-methods study results have helped provide nursing educators, management, and policymakers generate solutions to improve and change current IPs structure and delivery in Singapore OR units and improve on those gaps. Besides recognising the impacts of current OR nursing IPs in Singapore OR units on its nurses, the study has helped the nursing profession close gaps in issues contributing to the ongoing poor staff retention rate in their OR units. Also, with the sufficient exploration of the phenomenon done in the study, it was able to compare the results with previous international findings that have established similarities, differences, and new perspectives on the phenomenon. Hence, it has helped build recommendations and solutions to strengthen the nursing IP structure available in Singapore healthcare institutes.

The study has explored the impacts of current OR IPs on OR NJNs in Singapore. The study aimed to provide insights into the effectiveness of current perioperative IPs for NJNs in Singapore OR units, informing nursing academia and administrators of the existing gaps.

The objectives of the study were, in the Singapore context of OR unit NJNs, to:

1. Explore the impacts current OR nursing IPs in Singapore OR units had on its OR nurses.

2. Explore the effectiveness of current perioperative IPs for NJNs in Singapore OR units.
3. Understand the different group experiences of OR nurses who were given structured IPs versus the ones who did not.
4. Explore the potential benefits of having structured perioperative nursing IPs for enrolled and registered nurses.

Nature and Significance of the Study

The study used the explanatory sequential mixed-methods design as the nature of the study. The explanatory sequential mixed-methods design used for the study allowed the bridging of the findings in each phase of the study, further adding meaning to the phenomenon (Creswell, 2014). It first applied the quantitative research design to survey the trends of participants' perspectives concerning the phenomenon, followed by qualitative research, which was mapped from the trends analysed in the quantitative findings (Guetterman et al., 2015). Thus, the mixed-methods design avoided the redundancy of findings explored as it addressed the findings from both quantitative and qualitative findings in-depth.

In the quantitative phase of the study, a cohort study design was used to compare the challenges faced by OR NJNs between those with structured OR IPs and those without that had later impacted them in their job roles. These involved OR NJNs in Singapore answering an online survey questionnaire to describe their experience before, during and after undergoing their OR nursing IPs. In the qualitative phase of the study, the phenomenology design was used to investigate the existing phenomenon within its living conditions (Polit & Beck, 2010). It was based on the Singapore OR NJNs' description of their experiences with the OR IPs they underwent. The questions asked were structured based on the quantitative

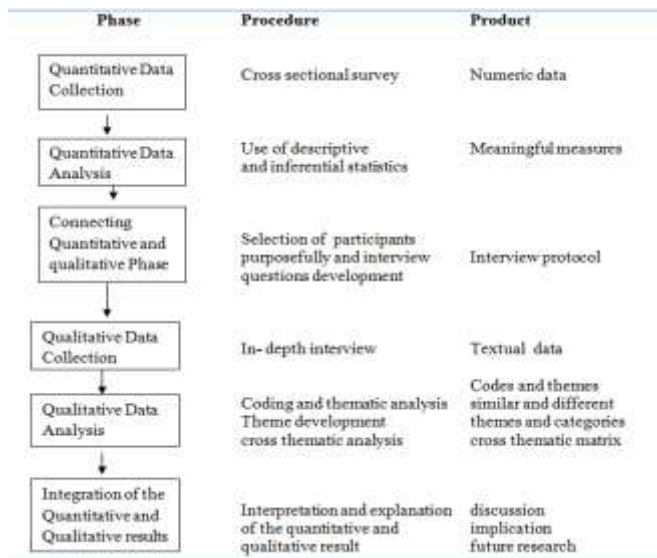
study's findings. The use of the phenomenology design was beneficial for exploring and explaining the study's phenomenon as the design structure committed to examining all views of the participants and exemplifying their lived experiences based on those opinions (Ball, 2011; Rutberg & Bouikidis, 2018).

The data collection stage began after the University ethics committee granted ethical approval. It included the researcher administering a cross-sectional online survey questionnaire to collect relevant data for the quantitative phase of the study. These included nominal data such as gender and ordinal data such as OR nursing experience (Pandyan et al., 2016). Subsequently, the quantitative data collected were analysed using the IBM SPSS Statistic 28.0.1.1. After the analysis of quantitative data, qualitative data collection began. It was administered via an interview questionnaires that was self-developed as the data collection tool. The interview used a semi-structured interview format based on a flow of questions which participants' responded to accordingly. The researcher used Braun and Clarke's (2014) six-step thematic analysis process to transcribe the verbatim data through computer coding for the qualitative data collected.

Lastly, the quantitative and qualitative findings were integrated to interpret and explain the research findings. It opened the discussion for the overall findings of the research, which provided rigour to the study and the future implications of the research topic (Subedi, 2016). The overview of the nature of the study can be seen in Project Management Chart (see Appendix A). Figure 1 provides an illustration of the discussion for the research nature of the study.

Figure 1

Explanatory Sequential Mixed-Methods Design



Note. This model was produced by Subedi in 2016, summarizing the process of the explanatory sequential mixed-methods design. From 'Explanatory Sequential Mixed Method Design as the Third Research Community of Knowledge Claim,' by D. Subedi, 2016, *American Journal of Educational Research*, 4(7), p.574.

The significance of the study was paramount. Firstly, in line with the Singapore government's recognition of the need to sustain and retain more local nurses, the study provided a better understanding of how reducing clinical stress and having more guided learning in specialised nursing fields would better prepare new nurses in their new full-time roles. It concurred with Chan and Morrison's (2000) study that shared the experience of 114 nurses surveyed in the late 1990s intention to remain employed after gaining more years of work experience as they had developed a sense of security and commitment to the profession. Thus, the findings of this study would be to provide insights that would prepare the newer generation of Singapore OR nurses to receive the baton from the ageing nursing workforce and gain the necessary skills and knowledge in the effort to remain in the OR nursing workforce longer. Moreover, it ensured that challenges faced by OR NJNs in Singapore would be acknowledged by key nursing leaders who could initiate change to the current systems. As informed by Hussein et al. (2017), this would promote the confidence and

competence of NJNs in their daily practices and establish a more robust support system for NJNs in nursing units.

Secondly, the study has helped address the challenges of NJNs present from the start of their post-registration journey or when joining a new OR unit. It ensured these problems would not escalate and affect OR nurses' career paths and ambitions. Furthermore, it was necessary to acknowledge these issues as the continual evolution in nursing practices implied that organisations and schools must constantly review their policies and procedures to sustain practice standards. It was evident from an editorial article written by the former Professor and Head of Alice Lee Centre for Nursing Studies at NUS, in which he shared that the vision of Singapore nursing profession by 2020 would have a well-defined and up-to-date career path and a profession that concurred with evidence-based practices that were tailored-made for a unique nation in a special region (Arthur, 2007). However, the vision was not visualised as many issues have contributed to the nursing profession from being progressive at the individual, social and organisational levels. The recent SARS-CoV-2 global pandemic was evident in how the nursing profession has had to put on hold other areas of clinical nursing specialities to focus more on stringent infection control measures and nursing to reduce the spread of the virus and keep the workforce safe. The trauma nurses were undergoing during the pandemic severely affected their mental health, which raised concerns about both safeties of patients and nurses (Nelson & Lee-Winn, 2020; Rajkumar, 2020).

Past works of literature also concurred that the mental health of nurses, such as the ones faced in the SARS-CoV-2 pandemic, played a crucial role in nurses' functionality and safety of patients under nurses' care as poor mental health due to fatigue and stress led to issues on good cognitive and problem-solving abilities (Barnsteiner, 2012). Therefore, exploring and understanding the challenges faced by OR NJNs as a result of their OR unit IPs

received has helped provide a long-term plan for nursing policymakers, administrators, educators and schools to adjust their programmes based on the evolution of nursing science and improve the mental health of nurses that were related to work-related fatigue and stress. Moreover, the study has placed the importance of perioperative nursing content in Singapore nursing schools where exposure to OR nursing was inadequate.

Research Questions and Research Hypotheses

As mentioned in the discussion of this study's aim, the study explored the impacts current OR unit IPs had on NJNs in Singapore OR units. It also aimed to explore the challenges faced by Singapore OR nurses with the current OR nursing IPs that impacted them in their roles and understand the experiences and potential benefits the different group of OR nurses had when given a structured IP versus the ones who did not. Thus, aligned with the purpose of the study, these research questions were answered and hypotheses were tested to support the findings of the study and inform of the new knowledge discovered:

RQ1. To what extent did having an OR unit-specific specialised nursing IP enhance OR unit nurses' knowledge and skills in performing new job roles?

H1₀. Having an OR unit-specific specialised nursing IP would not result in the enhancement of OR NJNs in Singapore's knowledge and skills in performing their new job roles.

H1_a. Having an OR unit-specific specialised nursing IP would result in the enhancement of OR NJNs in Singapore's knowledge and skills in performing their new job roles.

RQ2. To what extent did the challenges NJNs in Singapore OR face with the OR unit-specific specialised nursing IP affect their ability to perform their roles?

H2o. OR unit-specific specialised nursing IPs did not affect Singapore OR NJNs' challenges with their ability to perform their roles.

H2a. OR unit-specific specialised nursing IPs affected the challenges Singapore OR NJNs faced with their ability to perform their roles.

With the aid of the research questions, the study explored the relationships and associations between variables regarding the phenomenon that existed (Hedges, 2015a). The research questions have helped investigate the study's aims at exploring the effectiveness of having structured IPs for NJNs in Singapore OR units.

Organisation of the Chapters

The report of the study was presented in five chapters:

Chapter 1 introduced the readers to the background of the phenomenon and provided the rationale for undertaking the study. The study's nature, objectives, research questions and hypotheses were also addressed.

Chapter 2 will provide a critical review of the literature in view of the research aims and objectives. From the review of literature, Benner's (1984) '*From Novice to Expert*' theory and Warren and Mills's (2009) '*Conceptual Model of Nursing Motivation*' were discussed.

Chapter 3 will provide a holistic discussion of the explanatory sequential mixed-methods design. The operational variable and the development of the instrument tools used for the study were discussed, as well as the population, sample and participants involved in the study and the research procedures undertaken. Lastly, the chapter described the ethical assurances, data collection strategies and data analysis.

Chapter 4 will present the research data collected for the study. The chapter comprised the findings, interpretation and discussion emerging from the data collected from the mixed-methods study.

Chapter 5 will summarise the findings and conclusion of the study. The limitations, strengths and weaknesses of the study were discussed, along with recommendations made for possible strategies that could be employed to improve the impacts OR nursing IP has on Singapore OR NJNs.

Chapter Summary

This chapter has captured the direction of the study, where the background of the phenomenon was introduced and supported by the relevant extant literature. The problem statement, the purpose of the study, the research aim, the objectives, and the research questions and hypotheses were also outlined. The study significantly brought awareness to nursing policymakers, administrators, educators and schools regarding the impacts OR nursing IPs had on NJNs in the Singapore OR units. Moreover, it allowed them to find a resolution in a collaborative effort between the healthcare institutes and academia. The following chapter will comprise the literature review mainly surrounding the issues related to OR nursing IPs.

CHAPTER 2: LITERATURE

Chapter 1 provided the background and context for exploring the impacts of OR nursing IPs on OR NJNs. The purpose of this chapter was to critically review the literature in line with the problem statement discussed in Chapter 1. These included a review of the local (Singapore) and international literature to summarise the broader aspect of challenges NJNs in the OR units globally face with their current IPs that have impacted them in their roles. Thus, the literature review aimed to establish those gaps and inconsistencies within the literature. In doing so, it supported the development of debate to sustain the need for the study. Furthermore, it assisted in establishing the significance and perpetuity of findings that inform policy and practice. The chapter will also present the theoretical and conceptual frameworks that guided the study.

The literature critically examined and evaluated the challenges NJNs in OR faced with the IPs that later impacted them in their job role, particularly the effectiveness and delivery of such programmes. However, following a preliminary examination of the literature, other themes emerged that have influenced the challenges these nurses in the OR units faced with the IPs that later impacted them in their job roles, such as support system and confidence and competency.

To inform the literature review, searches were performed using multiple library databases accessed, such as Google Scholar, Unicafe University library resource, World Wide Web and other online libraries from several institutes of higher learning. The databases used included search engines from Cinahl Plus, EBSCO Host Research, Google Scholar, Medline and ProQuest Health. They had E-books, scholarly peer-reviewed journals and student dissertations. The research was reduced to include only literature in English about the challenges NJNs faced in the perioperative settings with the IPs that impacted them in their profession. The Boolean operator was used to identify key search terms that derived from the

dissertation study title, which included “*challenges faced by new nurses with orientation programmes*”, “*impacts faced by new nurses with orientation programmes*”, “*new joint nurses challenges*”, “*competent operating room nursing care*”, “*new joint nurse induction programmes*”, “*challenges of new joint nurses*”, and “*challenges of new joint nurses in the operating room*”. In addition, as some of the searches were likely to include variants, terms with country-specific studies were included. An extension of key search terms is presented in Appendix B.

Sequentially, the review of the most recent and relevant literature was undertaken. The searches were restricted to include literature within the past ten years (2011-2021). However, valuable literature that dated back before the timeline was included for its rich findings. The literature search revealed a wide gap and focused on research for NJNs in the Singapore OR units. Furthermore, there has also been a lack of international studies to explore the challenges of NJNs in OR units that impacted them professionally, socially and individually. However, relevant literature concerning the study’s phenomenon highlighted several themes that have contributed to challenges that led to impacts on NJNs due to their IPs.

Theoretical/Conceptual Framework

Benner’s From Novice to Expert Theory

Like all professions, new nurses entering the industry and the clinical unit would require time to fit into their workplace and career culture. These nurses' responsibilities and duties were similar to those of their senior colleagues. They were required to deal with their job descriptions to achieve safe patient care and abide by high standards of nursing practice (Benner, 1982). Traditionally, professionals in all professions achieved such goals by moving up the clinical competence ladder. A study by Dreyfus and Dreyfus (1980, as cited in Benner, 1982) distinguished five levels that one would pass to achieve such proficiencies in their

professional competence: novice, advanced beginner, competent, proficient and expert.

Patricia Benner later adopted Dreyfus and Hubert Dreyfus's 1980 Dreyfus Model of Skill Acquisition in her 1982 study (Benner, 1982; Benner, 2004, as cited in Graf et al., 2020).

Benner (1982) adopted the model as it offered a practical tool to understand the difference between experienced and novice nurses. The names of the models were made dissimilar to distinguish the two models, and the expectation in the first two levels was illustrated to focus on the nursing professional development specifically (Benner, 2001, as cited in Graf et al., 2020). These five levels were described by Benner (1982) and Benner (1984) included:

- Level one, novice, referred to beginner nurses who had no experience with the given task and required total supervision of skills performance.
- Level two, advanced beginner, were nurses who have had some experience and understanding regarding a particular task and could perform at a satisfactory level based on their past experiences.
- Level three, competent, referred to nurses who were competent and have been on the job for typically two to three years and were able to cope with clinical environmental stress and drew out plans by prioritising goals through proper goal settings.
- Level four, proficient, referred to proficient nurses who were regarded to have a more excellent grasp regarding a clinical situation with good problem-solving skills and were encouraged to mentor nurses from earlier stages.
- Level five was expert nurses who have to reach an enormous level of experience in real-time regarding multiple clinical situations and could adapt and apply those skills and knowledge acquired from experience to different patients and environments.

Benner (1984) further enhanced the understanding of how each of these levels reflected changes in three different elements, namely:

1. A shift from a dependent state to an independent state of skill after

knowledge and skill acquisition;

2. A shift of perception from a small world view to a holistic view of a clinical situation after new knowledge and skill acquisition; and, lastly,
3. A shift from observer to an active participant.

Benner's theory, however, has been criticised for being neither direct nor predictable as it focused on individualist perceptions of their stages of skills and knowledge acquisition (Murray & Sundin, 2017; Wardrop et al., 2019, as cited in Graf et al., 2020). Marks-Maran et al. (2013) mentioned that the model's assumption was designed to understand the competence level of newly qualified nurses (NQNs) upon graduation rather than from student nursing. Marks-Maran et al. (2013) further argued that NQNs were considered competent or proficient upon graduation in countries like the UK. However, no evidence in the literature warrants these assumptions besides that it could be related to economic or workforce desirability (Marks-Maran et al., 2013). Nonetheless, many nursing researchers have seen the benefits of Benner's model. They used the strengths of Benner's theory to guide their study or create a conceptual framework, showing a significant understanding of the five developmental stages of which a nurse would acquire experience, knowledge, and skills from novice to expert.

For example, Whelan et al. (2016) utilised Benner's theory to explore how OR stimulation training could enhance knowledge and skill acquisition among OR nurses. Whelan et al. (2016) shared that applying Benner's theory in the stimulation training allowed OR nurses to identify their strengths and weaknesses in their OR nursing practices, thus allowing them to grow and improve. Moreover, it provided nursing simulator trainers with information about the nurses undergoing the stimulation and challenged them according to their competence level, thus building their problem-solving skills. Whelan et al.'s (2016) assumption was supported at the end of each stimulation training survey nurses undertook.

The surveys reflected that Benner's theory was beneficial in helping them understand the concept of systemic skills acquisition (Whelan et al., 2016).

Dumchin (2010) similarly discussed that using Benner's theory was beneficial in conceptualising a new framework to reevaluate the future of perioperative nursing education. It was because the foundation of Benner's theory was designed to give an orderly and systemic framework to understand the adoption of skills acquisition. Furthermore, Dumchin (2010) added that adapting Benner's theory in their conceptual framework and two other frameworks could better student nurses' learning experiences and motivation when empirically tested. Horwarth (2010) similarly shared that the foundation of Benner's theory helped improve the development of employee orientation programmes (OPs). Furthermore, Horwarth (2010) shared that Benner's theory framework benefited NQNs and nurses in new clinical roles.

In another study, Brown and Sorrell (2017) shared that adopting Benner's theory as their study's theocratical framework helped them explore the challenges novice nursing mentors faced transitioning from clinical practice to academia. Brown and Sorrell (2017) discussed in their findings that novice academic nurse educators' perceptions of their new role transition were parallel to the timeline of skills acquisition of novice nurses, as systemically discussed in Benner's *From Novice to Expert* theory. Participants in the study shared that the availability of a mentor in their new role who provided the necessary support to reduce the potential challenges they initially anticipated, which were parallel to Benner's (1984) description of novice nurses. Those views were consistent with Graf et al.'s (2020) discussion of Benner's theory in their critical review of transitional models. Thus, one of the theoretical underpinnings of this study, based on Benner's *From Novice to Expert* theory, was that the different levels of OR nursing competence would translate to the challenges they faced due to the impacts of their IPs.

As discussed in Chapter 1, the argument was that the complexity of nursing practice today, especially in speciality-trained areas like the OR unit, could not be acquired by trying to compress the knowledge and skills within a few weeks. Thus, it justified the applicability of Benner's model for the study. The challenges individual nurses face might differ over generations. These would include theoretical education and clinical skills performance that has changed over time due to evidence-based findings (Dolezel et al., 2021; Elhami et al., 2018) and advancing technologies (Kavanagh & Szweda, 2017; Phillips et al., 2015; Theisen & Sandau, 2013). Thus, it has created a real shock to practice (Chen et al., 2021; Cheng et al., 2014). Benner's model lent an understanding of how nurses became more intuitive as more experience was gained, which continued to forcefully influence becoming an expert-level nurse (Benner, 1984). Benner et al. (2010) also shared that nursing management and educators in healthcare institutes should start acknowledging the challenges faced by new nurses with theory-to-practice gaps and their inconsistencies. It was so to avoid further disconnect from the profession. Hence, as shared by previous nursing researchers, the interpretative approach of Benner's theory was beneficial in guiding both stages of the study as it supplied the study to understand the impacts of OR nursing IPs Singapore OR NJNs collectively and individually and identified common themes from those findings.

Warren and Mills's Conceptual Model of Nursing Motivation

The conceptual model of nursing motivation (Figure 2) was a conceptual model developed by Warren and Mills adapted from Porter and Lawler's (1968) work on motivational theory and from the social and psychological variables from Sussman and Vecchio (1982). It aimed to expand the concept of organisational influences and individual traits of these variables (Warren & Mills, 2009). The conceptual model of nursing motivation was developed to explore the motivating factors for nurses to return for an acute care advanced degree or registered nurse (RN) diploma.

Warren and Mills (2009) suggested that certain perceived efforts must be a product for nurses to respond to their behavioural actions. Firstly, two organisational influences were internalised by nurses in the pursuit of returning to school for an acute care advanced degree or RN diploma. These included organisational rewards and incentives. The individual further internalised these organisational influences through three different variables related functions to self-evaluate individual traits to reduce motivational barriers. These included:

1. Value,
2. Identity, and
3. Utility (Warren and Mills, 2009).

The first variable, value related function, was associated with a process of internalisation, where individuals' motivation coincided with their value system because it might be or could be intrinsically rewarding (Sussman & Vecchio, 1982). These were measured through a shortened professional commitment questionnaire to evaluate professional commitment (Warren & Mills, 2009).

Next, the identity related function was associated with a process of identification, where individuals' motivation was influenced by the acceptance of successful engagement with another individual or group (Sussman & Vecchio, 1982). Specifically, this might be perceived as a nurse's behaviour controlled by the attractiveness of organisation belongingness and social commitment. Warren and Mills (2009) measured variables relating to identity-related function using a 5-Likert scale, strongly agree to strongly disagree, based on Greenhaus et al. (1990) career satisfaction scale. The scale was significant in measuring and identifying the variety and extent of self-concept and social bond of an individual to an organisation (Sussman & Vecchio, 1982).

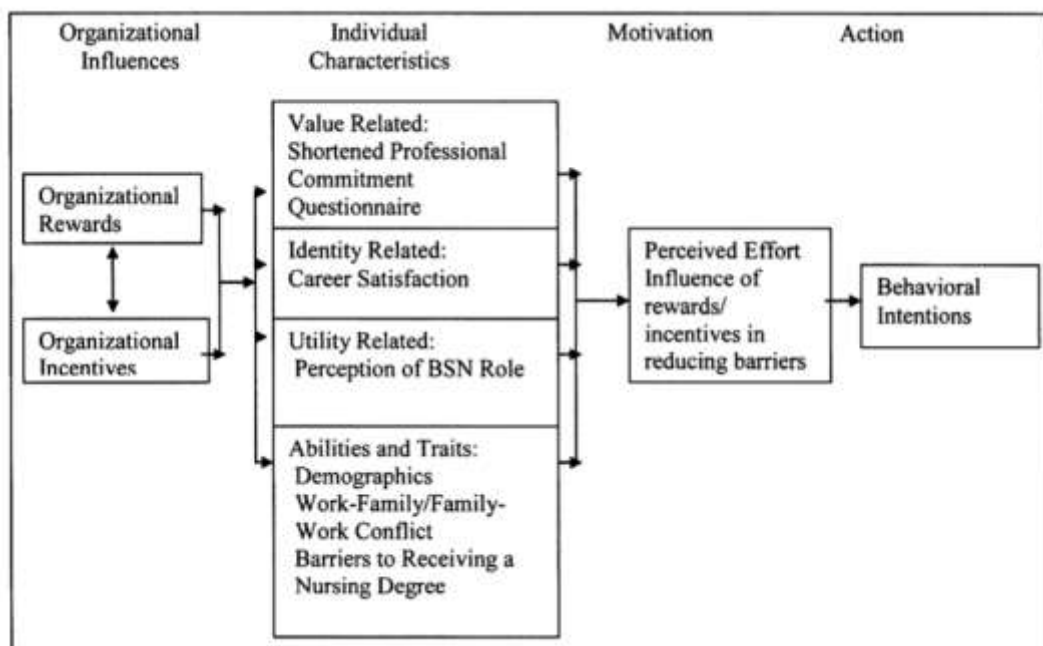
Lastly, the utility related function was associated with nurses' perception of their ability to return to school to pursue their nursing education (Warren & Mills, 2009). A 10-

item scale, including work-family and family-work, by Netemeyer et al. (1996), was used to measure nurses' perceptions of different variables. These included inter-role conflict that might affect family-associated responsibilities and the ability to return to higher education related to work-role conflict (Warren & Mills, 2009).

Based on the findings from the three related function items, Warren and Mills presented the variables to identify whether nurses' motivation to action their return to higher education was influenced by rewards or incentives from their organisation. Figure 2 illustrates the concept discussed.

Figure 2

Conceptual Model of Nursing Motivation



Note. This model was produced by Warren and Mills in 2009, summarising nurses' motivation to action their return to higher education. From 'Motivating Registered Nurses to Return for an Advanced Degree,' by J. Warren, and M. Mills, 2009, *The Journal of Continuing Education in Nursing*, 40(5), p.201.

The conceptual model by Warren and Mills was the first of its kind developed for the nursing profession (Alamri & Sharts-Hopko, 2015). It has recently been utilised in nursing research, highlighting its applicability for exploring phenomena related to nursing

motivation. Besides, the combination of two past well-established theoretical models justified the finished product developed by Warren and Mills, with each variable further tested using past tests and tested scales, which was beneficial in narrating this study's phenomenon.

Guided by their conceptual model of nursing motivation, Warren and Mills (2009) found that if an organisation acknowledged the barriers to nurses' motivation seeded by organisational influences such as incentives, it increased the success of motivating nurses to pursue higher education.

One study, for example, used the four individual characteristics functions from Warren and Mills's model in their motivational factors and measurement for nurses to return to school conceptual model, respectively. The study's authors confirmed that organisational rewards and job requirements influenced nurses' return to higher education (Alamri & Sharts-Hopko, 2015). Other existing studies have also shared that conceptual motivational nursing models, such as Warren and Mills, have helped organisations to identify how they could support their nurses to pursue higher education through organisational influences (Cathro, 2011; Kovner et al., 2012; Schwarz & Leibold, 2014). Therefore, based on the conceptual framework by Warren and Mills, this study conceptualised that to overcome the impacts OR nursing IPs had on OR NJNs, the nurse would require certain perceived efforts. The framework was helpful in its applicability to understanding the findings during the qualitative part of this study.

In essence, by linking the variables from Benner's theory and Warren and Mills's conceptual model, the author established the study's research questions and hypotheses, as presented in Chapter 1. Furthermore, understanding the level of competence based on self-identification of the level of nursing through years of nursing practice and the intrinsic motivational barriers from past nurses with their IPs that would be discussed in the continuation of this chapter through the review of the literature has lent focus on identifying

similar attributes to the study phenomenon. As informed by research, both frameworks have shown effectiveness in their usage and evaluation of NJNs and the motivation towards continuous nursing education for personal career progression. Furthermore, the frameworks helped recognise the motivations of NJNs in the study to go beyond the initial level identified after the completion of their programmes to better themselves. The following section of the chapter explores the study's field and industry description.

Perioperative Nursing. Perioperative nursing was described in the literature as a sub-division in the nursing profession within the hospital organisation, specialising in OR nursing care for patients undergoing elective and emergency surgical procedures (Gutierrez et al., 2018). Nurses play multiple roles within the perioperative unit (Wu & Taylor, 2020). These roles would include anaesthetic, scrub, scout and recovery nurses (NHS Careers, 2017; Wu & Taylor, 2020). The role of anaesthetic nurses was to assist the anaesthetists with the induction and extubation of a patient undergoing surgical procedures (NHS Careers, 2017). Scrub and scout nurses assisted surgeons with surgical procedures, while recovery nurses were involved in post-surgical care before transferring the patient to the appropriate care unit (NHS Careers, 2017). These job descriptions of perioperative nurses were similar to those of nursing researchers in the extant literature (Chappy et al., 2016; Koh et al., 2011). However, the role of perioperative nurses has not been widely explored in the literature. The literature described it as a role where nurses practice with high competence collaboratively with other healthcare professionals in a highly stress-filled environment (Koh et al., 2011; Shin & Kim, 2021). Despite the lower attraction rate for nurses to choose perioperative nursing as a profession because of the lack of exposure to the unit and poor clinical placement experience (Elley, 2016; Schmidt & Brown, 2019), some look at the benefits of the role, for example, the luxury to provide one patient care at a time (Støren & Hassen, 2011). It was viewed as a luxury as nurses felt they could provide more patient-centred care. Additionally, nurses with good

clinical placement experience during student nursing were likely to return to the OR unit due to the excellent establishment of academic-practice relationships by their schools and hospitals that were beneficial to their clinical learning experience (Schmidt & Brown, 2019).

Authors in the literature expressed the responsibility of nurses working in the OR unit to be ethically and morally charged based on the patient's interest (Blomberg et al., 2019). These included advocating for the patient when they were in doubt and fulfilling and voicing their request for perioperative care. In addition, a considerable aspect of perioperative nursing, or as some literary terms as OR nursing, involved teamwork. It involved OR nurses communicating with multi-professionals within the OR settings, including doctors, allied health personnel and fellow nurses (Holmes et al., 2019; Shin & Kim, 2021; Wu & Taylor, 2020). In those communications, the role of OR nurses was to ensure that each team member practices within their professional jurisdiction and to be an agent of change when malpractice was observed (Gutierrez et al., 2018; Kunic & Jackson, 2013). However, the OR's hierarchy has hindered such efforts as nurses, especially those on the lower chain, feel mistreated and disrespected (Del Grosso & Boyd, 2019; Freeling et al., 2017; Spruce, 2019). Thus, from the literature's description of the perioperative nursing field, the impacts of OR nursing IPs on NJNs might be inevitable due to the challenges they face during and after their IPs.

Furthermore, research has shared that the scarcity of OR-skilled nurses has led some countries to employ scrub technicians to fill the role of scrub nurses (Pupkiewicz et al., 2015). Hence, the following sections of the literature review became essential to explore nursing IPs' impacts on nurses and what might have led to the demise of perioperative nursing. The review discussed the transition to practice issues and, later, explored the impacts these challenges had caused.

Transition to Practice

NGNs joining the nursing workforce have been an essential group that brought the latest evidence-based theory and a fresh dynamic to the workplace. Transition to practice has been a common phenomenon explored by many social scientists to understand the challenges NGNs encountered in transitioning from student to professional practice (Freeling et al., 2017; Teoh et al., 2013). In nursing research, factors that have been identified to link novice nurses' transitional challenges from student nurse to professional nurse varied from lack of competence and confidence in communication, critical thinking, practical skills and professionalism (Gregg, 2020; Rabie et al., 2020). The hectic nature of the healthcare industry, which often lacked the forthcoming positive energy towards new employees, further added to these factors (Stephens et al., 2017). This made the transition to the practice phase the most challenging time for NGNs as they became new to the team and required ample support to adapt and function in their roles.

Unfortunately, the literature has shared that these challenges were more imminent in speciality care areas such as the OR units. Past studies also revealed this was due to the lack of clinical exposure to the OR unit during student nursing (Foran, 2015; Elley, 2016; Schmidt & Brown, 2019; Vortman & McPherson, 2021). Considering the complexities of the OR environment and other speciality units unseen during student nursing, novice nurses' reality and transition shock were more significant than in areas where clinical exposures were more available during student nursing. In addition, the continuous attrition rate of NGNs was also becoming concerning. As transitioning to becoming a skilled nurse in these areas required a longer time frame (Sherman, 2015), adaption became an issue, leading to novice nurses seeking coping mechanisms to practice daily in the unit (Pupkiewicz et al., 2015). Hence, a robust support system must be viable and available in the clinical areas for NGNs in speciality care units to reduce reality shock during their transitional period.

Theory-Knowledge Gap during Transition Period

Kramer (1974) first identified that the reality shock of novice nurses was linked to the transition from student nursing that had a mismatch between theoretical knowledge and expectation of professional practice gap. The substantive study by Kramer focused on the very problem novice nurses had with transitional periods post-nursing school. Kramer's research has contributed significantly to understanding the phenomenon of transitional shock in nursing. The results from investigating two experimental groups upheld four of the five hypotheses tested. Kramer's (1974) rejected hypothesis revealed that nurses in the controlled group did not let go of their professional values as initially hypothesised; instead, they remained equally committed as other groups in the study when they did during graduation. It has become subjectively true today, as nurses remain committed to the moral stature groomed during their nursing careers. In terms of experiencing job satisfaction and degree of success in professional duties, Kramer's (1974) study revealed that baccalaureate nursing students in the controlled group who undertook the Anticipatory Socialization Program during their three years of nursing programmes were better able to operationalise these variables. It was in comparison to the uncontrolled group, which did not. The implications of Kramer's study have reached out to many nursing researchers to understand why nurses leave the profession. Kramer (1974) suggested that it was due to baccalaureate nurses' lack of anticipatory reality shock in such a gap upon transition from student to professional practice nurse that contributed to the issue.

Recent studies continued to reflect findings similar to Kramer's regarding novice nurses' challenges in transition to practice. The extant literature concurred with Kramer on the high prevalence of transition shock among NGNs during their earlier months into the profession (Chen et al., 2021; Hung et al., 2018; Ortiz, 2016). For example, Chen et al. (2021) performed a descriptive, cross-sectional design study exploring transition shock,

preceptor support and nursing competency among newly graduated RNs. A total of 214 NGNs holding an RN professional title were recruited through convenience sampling (Chen et al., 2021). In the findings, Chen et al. (2021) concurred with previous authors, stating that nursing preceptorships and transition shock showed a statistically significant correlation with NGNs' clinical competence. In addition, emotional challenges remained the highest denominator (34%) in NGNs transition shock (Chen et al., 2021). Therefore, the success of transitional practice has remained a top priority for the nursing workforce as it reflected on nurses' competencies and retention rates. Besides, as knowledge-based gaps nurses faced were challenging to identify, especially during the first three to six months of transition to practice, they were critical to being addressed (Cheng et al., 2014; Hung et al., 2018; Ortiz, 2016).

Chen et al. (2021) suggested that as critical thinking skills were necessary during the pre-nursing registration stage, there should be a collaboration between nursing educators and preceptors to induct clinical scenarios to induce critical thinking in simulated or clinical settings during student nursing programmes. This was essential to help shorten the knowledge-practice gap. Dev et al. (2020) and Graf et al. (2020) concurred with Chen et al., stating that this would help increase student nurses' critical thinking. Chen et al. (2021) also pointed out that the ratio of NGNs to a preceptor should be 1:1, which was shown in previous studies to have enhanced communication and professional practice. Similar studies to Chen et al. shared that the availability of a good mentorship could help narrow the issue of theory-practice gaps and improve NGNs' adaption to the complex clinical environment (Hung et al., 2018; Tiew et al., 2017). However, although nursing leaders have acknowledged the importance of providing such a workplace support programme (Sherman, 2015), it could be a central challenge due to the deficiency of skilled preceptors associated with staffing shortages.

Likewise, another study by Al Awaisi et al. (2015) shared that NGNs in Oman had challenges with the professional transition attributed to clinical scenarios that were often encountered, which markedly differed from what was anticipated. A significant population of those NGNs, generally in their first year of transition, hoped they had received adequate clinical practice to eliminate clinical incompetence and lack of confidence in nursing practices during their student nursing (Al Awaisi et al., 2015). Similarly, Ortiz (2016) shared that when NGNs felt a vast disconnect between school and professional practice, it reflected their lack of professional confidence. Ortiz (2016) explained that this occurred because the NGNs interviewed expressed that the confidence that nursing school prepared them for did not translate or was sufficient for when they turned professional. However, the NGNs viewed it as a process and an opportunity to build self-confidence in their profession (Ortiz, 2016). Therefore promoting success towards their professional confidence. Likewise, Odland et al. (2014) mentioned that NGNs felt a sense of laxity and shock by responsibilities upon transitioning to professional nurses due to the lack of exposure to roles in student nursing. It led them to realise that they had to be independent from the day they started their professional role.

A survey study by Woo and Newman (2020) also reflected that only 53.3% ($n = 16$) of Singaporean NGNs surveyed felt competent in managing their professional duties. Furthermore, most interviewed later ($n = 4$) mentioned that the omission of certain clinical teachings during student nursing contributed to their inability to confidently confront theory-to-practice gaps. Likewise, Al Alwaisi et al. (2015) found that NJNs viewed out-of-date and incorrect practices from nursing preceptors as unsuitable mentors as it did not help them uphold the professional standards expected of them.

These findings also corresponded to Tastan et al. (2013) study, which highlighted that only 58.7% of nurses agreed that working with a preceptor helped meet their expectations.

However, nurses in the study did not specify those expectations (Tastan et al., 2013). Thus, one study suggested that the nursing units identify theory-practice gaps and thoroughly assess NGNs' competency, knowledge and skills levels to gauge NGNs' theory-practice gaps and provide them with individualised and target teaching plans (Lewis-Pierre, 2013).

Transition Adaptation Period

Research has found that transitioning to practice or a new clinical work environment represented an adjustment period as nurses would require time to adapt. Al Awaisi et al. (2015) shared that this was prominent among Omani NGNs who expressed resentment of basic nursing care as they viewed it to condemn the nursing professional image, especially for a nursing degree holder. It resulted from their experience as student nurses, exposing them to more theoretical rather than hands-on nursing. Hence, it was a real shock when they started their professional nursing career to discover the disparity (Al Awaisi et al., 2015). Backhaus et al. (2017) shared that direct care staff and organisations observed such perceptions towards nursing degree holders in six nursing homes in the Netherlands. However, Backhaus et al. (2017) expressed that such perceptions towards nursing degree holders were displaced due to the strong leadership characteristics portrayed by these nurses. Hence, new nurses, especially nursing degree holders, must understand that nursing is a vocational profession and that there is no perfect fit regardless of educational attainment (Backhaus et al., 2017). Backhaus et al. (2017) also added that employers should provide expression role clarity before employing nurses of such groups to ensure satisfaction from both parties.

To further understand similar phenomena relating to challenges new nurses undergo during their initial year of practice, Wong et al. (2018) recruited eight NGNs from a local higher education institute in Hong Kong to participate in a qualitative descriptive study. The NGNs were recruited and invited for an hour of semi-interview and interviewed for data

collection based on eight themes identified through the literature review (Wong et al., 2018). The eight identified themes included workload, working environment, relationship with colleagues, expectations, support, communication, clinical knowledge or skills, and confidence (Wong et al., 2018). Subsequently, personal attitude, a typical behaviour displayed as a coping mechanism to overcome challenges during the professional transition, emerged as the ninth theme (Wong et al., 2018). Among these themes identified, NGNs found the workload to be the biggest challenge during the professional transition, which was interconnected to the other themes identified. The nurse-to-patient ratio in Hong Kong was unreflective of the international standards, which were two to four times less, thus making new nurses unprepared to operate independently (Wong et al., 2018). The findings were similarly outlined by other authors, which characterised the overwhelming workload that NGNs were unprepared for during their first year of professional transition due to inadequate staffing, support, clinical exposure and incompetence (Al Awaisi et al., 2015; Odland et al., 2014; Hussein et al., 2017). Woo and Newman (2020) explained in their study that these findings from previous research were linked to NGNs being shielded from the full breadth of an RN's roles and responsibilities. Moreover, Hung et al. (2018) also explained in their study that NGNs felt that gaps in their nursing skills and knowledge of real-life practicum were causative factors towards adaptation ability. Hence, it was recommended that healthcare institutions and schools work collaboratively on preparing nurses for their roles before and after the transition to practice (Hung et al., 2018; Woo & Newman, 2020).

Similarly, other authors reported that transitioning from nursing student to professional nurse remained the biggest challenge for novice nurses (Boychuk-Duchscher, 2012; Henderson et al., 2015; Nour & Williams, 2019). 14 Canadian NGNs from acute care settings that were recruited for a study aided by the grounded theory method identified four themes to gain a greater understanding of the challenges and experiences faced by NGNs,

namely i) entry into practice, ii) immersion, iii) committing, and iv) evolving (Nour & Williams, 2019). The themes that emerged from the '*Theory Becoming Alive*' (Appendix C) described the stages NGNs underwent. These included clinical learning experiences and challenges faced after transitioning to a professional nurse (Nour & Williams, 2019). Other nursing counterparts faced similar issues with these Canadian NGNs, who were initially unprepared for professional practice (Graf et al., 2020; Kumaran & Carney, 2014; Rabie et al., 2020). It has led to a high attrition rate (Odland et al., 2014); thus, efforts like support programmes have been implemented to counter these issues (Rush et al., 2013).

Being unprepared for an unfamiliar surgical procedure and clinical scenarios in the OR unit has reduced OR nurses' clinical participation (Smith et al., 2015a; Smith et al., 2015b). It suggested that the professional expectations after graduation remained the status quo in present-day nursing as knowledge of professional practice continued to see a gap. In such cases, it might be attributed to the lack of clinical supervision that would always be available for novice nurses throughout their entry into practice (Gellerstedt et al., 2018; Nour & Williams, 2019). Furthermore, clinical learning opportunities were not always available in the OR environment due to the constant complexities of clinical scenarios that were not optimal for safe clinical teachings (Smith et al., 2015a; Smith et al., 2015b). In their findings, Nour and Williams (2019) described the phenomenon as novice nurses' evolution in their nursing practices resulting from gradual self-commitment through gaining more insight and confidence. It was consistent with Benner's (1984) findings suggesting that novice to expert professional development was gradually based on years of professional experience and diversity of clinical exposure. Furthermore, the perception that NQNs or NJNs should be competent or expert upon professional practice entry held no evidence in the extant literature (Marks-Maran et al., 2013). Thus, these perceptions could be based on healthcare

organisations' desired economic or workforce key performance index (Marks-Maran et al., 2013).

A narrative review of the literature by Zanjani et al. (2018) also revealed another cohort of nurses, the overseas qualified nurses (OQNs), who faced challenges in their transition to practice. Zanjani et al. (2018) highlighted that the challenges OQNs faced included language barriers, cultural disparities and adaptation to a new nursing work culture, leading to psychological stress. Ohr et al. (2016) similarly pointed out that transitioning to a new cultural society and nursing arena could be an overwhelming and challenging experience for OQNs. To ease these challenges OQNs face, both authors recommended that healthcare industries implement adequate support systems as transition programmes, including formative assessment and bridging courses that were insufficient for OQNs to adapt from an Eastern to Western culture. Similar literature concurred with the recommendation stating that issues with cultural disparities must be acknowledged so that OQNs from Eastern culture nursing backgrounds could be more assertive in their approach (Kishi et al., 2014; Zhou, 2014).

Support System During Transition to Practice

Acknowledging the struggles of professional transition was not the only challenge nurses faced that impacted their jobs. Existing literature also shared the importance of strong support systems during a nurse's transition for challenges nurses face in a new job. The nursing practice arena could lead to further issues than those discussed thus far. For example, a qualitative study by Leong and Crossman (2015) mentioned that due to the slow adaptation, incidences of transition shock among NQNs in Singapore have led to a prevalence of workplace bullying (WPB). In addition, Leong and Crossman (2015) pointed out that the issue of WPB was essential to acknowledge as the transition to practice for Singaporean NQNs was critical for nurses' retention in Singapore. The study involved 26 new nurses

recruited during an awareness session in one of the Singaporean polytechnics. Another five nursing preceptors were invited to extend their understanding of managing new nurses, revealing two themes NQNs faced during their first-year professional practice. These included bullying and tough love (Leong & Crossman, 2015). In addition, the themes identified were associated with other sub-themes that act as a coping mechanism to overcome the challenges of WPB and the concept of tough love. These findings of coping mechanism strategies were similarly expressed in the similar literature, which shared that despite WPB hindering NGNs' transition, some nurses viewed it as a coping mechanism that established their strength and resilience towards the profession (Hung et al., 2018; Wong et al., 2018).

Similarly, 312 NGNs ($n = 24$ from OR units) from South Korea that were interviewed associated bullying as one prevalent factor in adverse work outcomes and intention to leave the profession (Chang & Cho, 2016). In the OR units, Freeling et al. (2017) reported that three perioperative nurses interviewed who had more than three years of working experience in the OR unit from an Australian metropolitan teaching hospital shared similar views. Similarly in another study, Lögde et al. (2018) discussed that bullying often happened in OR units because nurses felt powerless in communication with physicians and management, thus turning against each other out of frustration and eventually leaving the profession. Also, OR nurses in China ($N = 417$) who were surveyed shared that although WPB in ORs was low (15.8%), it was still prevalent (Yang & Zhou, 2020). However, Yang and Zhou (2020) shared that the low scoring on WPB could be related to questionnaire distributions and how Chinese cultural beliefs perceived weakness in acknowledging that one has been bullied. Thus, nurses refused to view WPB as a hostile act (Yang & Zhou, 2020).

These findings were consistent with similar studies suggesting that WPB was often accepted in the nursing workplace as it was often misplaced and misdiagnosed by senior nurses and management (Etienne, 2014; Hartin et al., 2020; Ovayolu et al., 2014).

Furthermore, when bullied, NGNs felt isolated and unheard (Ke & Stocker, 2019; Tuckett et al., 2015). This could lead to detrimental effects on NGNs as they continue to not speak up due to the lack of support systems, especially in an area such as the OR unit where horizontal and lateral bullying continued to plague the unit (Beitz, 2019; Freeling et al., 2017; Smith et al., 2015a). Additionally, Laschinger et al. (2013) shared that WPB among NGNs has been associated with poor mental health. For example, Lasiter et al. (2012) reported that a student nurse interviewed was still trying to recover from a WPB experience that happened two years before, suggesting that such an experience lasted longer than the occurrence of the actual incidence. Sherman (2015) added that a unit like the OR, which tolerated any form of a bullying culture, would have a substantial prevalence of poor staff retention. Additionally, Johnson and Benham-Hutchins (2020) shared that when bullying occurs either towards or against nurses, it might affect errors in nurses' practices. Hence, the clinical environment must practice a safety culture in its workplace by practising good communication to reduce nursing practice errors and improve patient care (Johnson & Benham-Hutchins, 2020).

In another study, using Rodger's evolutionary method that defined i) antecedents, ii) attributes, and iii) consequences, Anusiewicz et al. (2019) were able to confirm the consistent findings in the literature regarding WPB among NGNs that have led to detrimental effects on nurses, patients and healthcare organisations. Therefore, researchers who explored WPB issues among nurses recommended that to improve favourable working conditions, healthcare organisations should establish ethical principles that would uphold respect among colleagues rather than productivity and economic-driven priorities (Leong & Crossman, 2015; Lögde et al., 2018). It was crucial because bullying, especially among nurses in OR units, could have long-term effects on nurses' health and self-esteem, delivery of care, and patient safety (Spruce, 2019).

Similarly, another study that explored NGNs' lack of professional confidence shared that communication was the top aspect during the first year of transition to practice (Ortiz, 2016). In the study, NGNs expressed that they faced significant issues communicating with other stakeholders in their work environment. A participant from the study also shared that in one incident, his effort to advocate for his patient was not receptive by the doctors because he was only six months into his role (Ortiz, 2016). Similarly, another study shared that this issue was prominent because NGNs fear asking questions due to their lack of clinical reasoning and critical thinking skills (Halpin et al., 2017). Hence, instead of shutting down concerns and ideas from NGNs, leaders in the clinical environment should act more proactively in providing positive criticism and reinforcements to give these groups of nurses time to reflect on those situations (Halpin et al., 2017; Ortiz, 2016).

Transitional Support Programmes (TSPs) During Transition Period

The effectiveness of transitional support programmes (TSPs) on NGNs and nurses transitioning into new roles was also a common theme explored in the literature. For example, as part of a convergent mixed-methods study, Hussein et al. (2017) suggested that given the complexity of present-day healthcare and the overwhelming workload related to NGNs' unpreparedness during their first year of transitional practice, support systems could be established through TSPs. Of the 140 NGNs recruited, 81% completed the foundational survey, and 71% of the 81% finished the follow-up survey using two standardised instruments, namely, the Manchester Clinical Supervision Scale (MCSS-26) and the Practice Environment Scale Australia (PEC-AUS). In addition, 63% of NGNs who completed the follow-up survey were later given an open-ended free-text survey to respond to either the foundational or follow-up survey. The quantitative study found no significant differences in MCSS-26 and PEC-AUS scores NGNs rated based on their work satisfaction after undergoing a two-time period of 12-month TSP. The findings, however, could be biased as

the foundational survey was initially administered at the 8-12 weeks of the 12-month TSP. Thus, it might have reflected the intensity of transition shock NGNs underwent during the initial stages of professional transitioning (Duchscher, 2009).

Furthermore, self-report measures might have influenced participants to give socially desirable answers (Choy, 2014; Hussein et al., 2017). Nonetheless, the high rate of respondents in the study, with more than three-quarters returned surveys coupled with the study's mixed-methods design, has helped understand NGNs' experience during TSPs (Hussein et al., 2017). The qualitative aspect of the study found similar findings as previous authors discussed (Al Awaisi et al., 2015; Odland et al., 2014). Even with TSP, the overwhelming workload beyond NGNs' scope of practice was further burdened by inadequate skills mix and lack of exposure to different clinical scenarios (Hussein et al., 2017). These perceptions were also influenced by a change in clinical placements over the two-time period of the 12-month TSP (Hussein et al., 2017). However, NGNs were better prepared to handle basic nursing care on their second rotation. Hence, it suggested that it would improve nurses' knowledge and skills over time.

Tuckett et al. (2017) similarly researched a transition programme to investigate NGNs' views of the educational and professional support they received during their first year of professional practice. It was reported that the 197 NGNs from Australia and New Zealand in the study that underwent the Nurse Entry to Practice (NETP) programme in 2008 and 2009 were surveyed in 2013 using an online survey applied for positions they were posted to during the final school placing as a pre-registered nurse and managed to enter their preferred job placement for their first year in professional practice. The results indicated that these nurses had higher transferability with their transition to practice locally and internationally (Tuckett et al., 2017). It coincided with one study that agreed NETP programmes were effective for New Zealand nurses' professional transition (Haggerty et al., 2010). However,

this was a coincidence as such positions were plentiful during the economic crisis in Australia during the late 2000s, during which these groups of nurses' lived experiences were explored, making their posting selection more favourable to be achieved (Tuckett et al., 2017). In contrast, most nurses did not always enter their chosen unit. As informed by research, this could lead to challenges and professional stress (Missen et al., 2015) due to the experience of a new clinical environment and professional expectations (Wong et al., 2018; Hussein et al., 2017).

In another study, 25 RNs who undertook a “BE NICE CHAMPION” (BNC) programme to explore the negative impacts of WPB shared similar findings (Keller et al., 2019). The results suggested that the adequate use of the 4S's (Stand by, Support, Speak up, and Sequester) taught in the BNC programme helped improve NGNs' confidence to intervene when WPB arose (Keller et al., 2019). The findings also highlighted that bullying was the accountability of leaders when reported and recommended that nursing leaders expand the frequency and scope of training for WPB intervention (Keller et al., 2019).

Likewise, the Association of periOperative Registered Nurses (AORN) has also designed a programme to aid novice nurses in the OR nursing transition (Vortman & McPherson, 2021). The Periop 101 programme, which included modules such as employees' rights and communication, has been beneficial for OR nurses in understanding their position as novices in the OR unit. It echoed Işık et al. (2020) recommendation of how OR IPs such as Periop 101 highlighted the importance of addressing WPB and provided a more engaging clinical working environment. Furthermore, research has reflected that OR nursing educators shared that the Periop 101 programme benefited new nurses transitioning into the OR unit as it guided them through their transition. One study pointed out that it was due to the well-structured design of the Periop 101 programme that consisted of the latest evidence-based

theory and practices of OR nursing and how it provided progressively meeting learning needs (Martin, 2011).

Lastly, Duchscher and Windey (2018) recommended eight-pointers for a healthy transitional experience. These included:

- i) stable and supportive personal and professional relationships,
- ii) understanding roles and responsibilities during different stages of transitional periods,
- iii) obtaining constant and constructive feedback and support,
- iv) familiarising with nursing skills to deliver care,
- v) avenue to be supported, heard and collaborate,
- vi) ability to successful repeat clinical nursing skills consistently,
- vii) receiving positive feedback, reinforcement and reassurance, and
- viii) supported by the team when recommendations were given for workplace improvements (Duchscher & Windey, 2018).

These recommendations were beneficial for the nursing profession to reevaluate the onboarding behaviour displayed towards NGNs during their transitional period. One study shared that it was necessary to value every nursing member in a unit and understand that adapting to a new role and clinical environment requires time and support (Crafoord et al., 2018; Stephens et al., 2017).

Conclusion

Based on the literature review, it was evident that the availability of resource personnel was an essential component towards the transition to practice among NGNs (Innes & Calleja, 2018). In addition, the literature has also shared that the availability of a sound support system during the transitional period for NGNs has helped integrate behaviours, knowledge, skills, and values learned in nursing schools and has been crucial for professional

practice success. However, despite programmes to help reduce these transitional shocks, it was clear from the literature that such efforts still required improvements, especially in speciality care units like the OR, where the clinical environment was viewed as intimidating. Therefore, the following section of this literature review will explore the success and challenges of nursing IPs in OR and other nursing units. Additionally, the strategies healthcare organisations used to limit nurses' challenges in those programmes.

Induction Programmes (IPs)

As discussed in the previous sections, a positive transition to practice experience for NGNs and NJNs was achieved through good induction to a nursing unit. However, Leong and Crossman (2015) shared that transitioning from a nursing student to a professional nurse could be emotionally and mentally challenging. Thus, nursing IPs were given to all new nurses in a clinical area to reduce such transitional challenges regardless of professional experience, as the new environment equated to an experience similar to a novice nurse (Benner, 1984). Also, these tools acted as an introductory programme to give nurses an overview of their newly appointed position in their unit, helped them acknowledge theory-to-practice gaps, and made sound support systems available for them (Cushway, 2011; Moriarty et al., 2011).

Nursing induction and orientation programmes have been interchangeably cited in human resources and nursing research. However, a more definitive purpose of an IP was described as training areas related to mandatory legislation, corporate, and role specification and delivered within 12 months of employment (NSW Health, 2018) (Appendix D). It concurred with many existing studies suggesting an effective induction for nurses to show competencies in their job roles was generally delivered for at least 12 months (Ball et al., 2015; Cheng et al., 2014; Kowalski & Cross, 2010; Maxwell, 2011; Rush et al., 2013).

IPs were arguably the cornerstone for nurses' professional development in the healthcare sector during their transition period, as professional practice limited nurses' ability to hone themselves further academically due to commitments to build professional confidence (Pertiwi & Hariyati, 2019). Furthermore, theoretical knowledge and practical skills imparted in student nursing quickly became outdated or irrelevant in current healthcare settings (Chen et al., 2021; Dev et al., 2020; Graf et al., 2020). These challenges broaden in speciality care areas as high-stress clinical units reduce practical skills involvement opportunities (Smith et al., 2015a; Smith et al., 2015b). In addition, the challenges of attracting nurses to take up perioperative nursing and the increasing volume of surgeries have put the quality of care delivered to patients in the OR unit at risk (Sherman et al., 2014). Thus, nursing IPs such as TSPs were ideal platforms for transferring learning between experienced and novice nurses (Green, 2016).

Besides, research has informed that hospitals should proactively administer TSPs to aid NGNs and NJNs in transitioning to their new clinical environment (Green, 2016). It was especially crucial in speciality care areas as induction and orientation programmes would help build a firm foundation of nursing practices not previously exposed in student nursing (Monforto et al., 2020). The literature also highlighted that healthcare organisations should take accountability and provide adequate hours for IPs so NGNs and NJNs would be able to administer competent patient care and understand role specifications (Wolff et al., 2010; Monforto et al., 2020). Hence, this indicated the significance of providing IPs in all organisations and its importance in the new employees' transitional period.

Helpfulness of IPs for Nurses in New Clinical Areas

However, Strauss et al. (2016) shared that this was not extensively true. For example, only 51% ($n = 41$) of Israeli nurses who participated in the study mentioned that they had a structured OP as part of their transition programme (Strauss et al., 2016). Similarly, Odland

et al. (2014) shared that OP for NGNs seemed missing, and staffing issues made it challenging to conduct such programmes if made available. However, Strauss et al. (2016) shared that the positive sign was that the nurses agreed that having a structured OP correlated to having a positive experience with adaptation, work satisfaction, and a support system. Strauss et al. (2016) further shared that the high correlation between support and satisfaction was related to the OP design within an organisation tailored for new employees such as graduates. It was helpful for this group of nurses as their individual needs were supported by good mentors, increasing their satisfaction level (Strauss et al., 2016).

Similarly, 144 nursing counterparts from Western Canada who were interviewed graded IPs as helpful or moderately helpful in all educational opportunities, varying from classroom/theory, written materials, in-services and website materials that helped enhance their transition experience (Rush et al., 2013). Additionally, the Western Canadian NGNs of the graduating class of 2010 graded their IP to be very helpful (57.6%) in the availability of hands-on nursing skills. Rush et al. (2013) suggested that the availability of diverse educational opportunities was viewed as a form of support that was helpful beyond the content itself. Ankers et al. (2018) similarly pointed out that most NGNs interviewed felt more confident with their nursing skills after a 12-month transition to practice programme despite the many new demands that arose when starting a new professional role. However, with positive and constructive reinforcements that enhanced the positive emotional responses of NGNs, transitional experiences were positively enhanced (Anker et al., 2018).

Foley et al. (2021) also shared that hospital-based nurses ($n = 9$) transitioning to performing permanent roles as community care nurses viewed IPs as valuable assets to adapt to their new position. Despite a short two-week introductory programme for their new role as community nurses (CNs), the programme aided them in appreciating the philosophy of community care nursing and the different approaches to patient care (Foley et al., 2021).

Similarly, Monforto et al. (2020) shared that a redesigned OP that eliminated training information redundancies for nurses in critical care units (CCUs) of a 552-bedded northern-eastern US hospital aided novice nurses (< one year experience in CCUs) with gaining appropriate knowledge and clinical skills that could be quickly transferred to their new roles in CCU nursing. Existing studies concurred on the positive relationship between IPs and adaptation to new nursing roles (Ashton, 2015; Boylston & Burnett, 2010; Strauss et al., 2016).

Overseas nurses transitioning to a new nursing environment in countries like Australia and Singapore also reported the helpfulness of transition programmes to induct them into their role in a new country. Immigrant nurses in these countries found such programmes to be especially useful in understanding the cultural diversity and slight differences in nursing practices, which minimised challenges in transitioning and providing competent nursing care (Ohr et al., 2016; Zanjani et al., 2018). The findings were necessary for the nursing profession because it was highly dependent on its migrant nurses to fill gaps in nursing roles globally. Similarly, the literature on OR nursing highlighted that IPs were essential for novice OR nurses. For example, some researchers shared in the literature that IPs provided nurses with an overview of OR nursing concepts and familiarised them with OR nursing skills (Eriksson et al., 2020; Freeling et al., 2017). Thus, the benefits of such programmes in speciality care areas such as the OR unit and CCU should not be overlooked as they could provide powerful learning experiences for novice nurses (Beitz, 2019; Innes & Calleja, 2018). Furthermore, content within speciality care areas' IPs that helped acquire knowledge and skills positively affects nurses' confidence, proficiency, and transition (Innes & Calleja, 2018).

Challenges Faced by Nurses with IPs

Despite the efforts of the nursing division to impart efficient and effective nursing IPs for all nurses during their transition period, the growing body of evidence reflected that many challenges existed in running such programmes. For example, research has informed that existing IPs were not uniquely designed for each speciality care unit (Maguire, 2013). Furthermore, it could vary in content, duration and structure (Anderson et al., 2012; Phillips et al., 2015) in different healthcare institutes (Wong et al., 2018). Nevertheless, those efforts were the bearing of each speciality unit and healthcare institute to enhance the transition experience of their NGNs and NJNs. Additionally, it reduced the redundancy of clinical topics covered during fundamental TSPs, thus improving the efficiency of nursing educators delivering speciality TSPs (Monforto et al., 2020).

However, even with a uniquely designed IP in speciality care units, faculty nurses delivering these programmes reported that the repetition of content was frustrating (Monforto et al., 2020). Furthermore, NGNs found it incredibly challenging to set daily priorities when they did not possess the necessary elements for competent patient care as they were cast out during their transitional period (Odland et al., 2014). For example, clinical errors leading to a sense of guilt have led numerous novice OR nurses to resign from their roles due to the lack of education provided during their IPs (Spruce, 2019). It was further affected by their lack of clinical decision-making skills in different clinical scenarios that expert OR nurses possessed (Arzani et al., 2016). It was because competent nursing care would require time, an appropriate learning environment and recourses (Crafoord et al., 2018). Thus, acknowledgement and support from employers regarding new nurses in a clinical area were vital (Odland et al., 2014). Strauss et al. (2016) also pointed out that TSPs tailored to acknowledging nurses learning disabilities and needs saw better professional satisfaction than TSPs that were informal or overlooked those issues. Thus, challenges with patient safety that

new OR nurses experience during IPs could be overcome with the right resources and support when acknowledged.

In other clinical areas, NGNs concurred with OR nurses, stating that patient safety issues were the common reason for leaving the nursing profession within the first three years of practice (Hoffart et al., 2011). Additionally, existing literature shared that rapid turnover of patients due to shorter lengths of stay and advances in technology added to hindering novice nurses' ability with clinical judgements and confidence (Kavanagh & Szveda, 2017; Phillips et al., 2015; Theisen & Sandau, 2013). Furthermore, such scenarios became concerning as they stretched the issues of poor staff retention and loss of human resources due to losing NGNs and NJNs in the OR nursing post-induction programme (Vortman & McPherson, 2021).

Similarly, Graf et al. (2020) shared that these challenges arose even with a well-designed IP due to the lack of support NGNs and NJNs received during their transition. Cook (2016) shared that this could be rectified by encouraging adequate knowledge sharing between learners and teachers to act as key educational support during the transitional period. It included knowledge sharing by the expert nurse to the novice nurse so that novice nurses could gain clinical competence and confidence during the transition (Boyer et al., 2018). However, with time and human resource constraints, senior nurses found it challenging to continue guiding new nurses over a long period if the learning threshold was not progressive (Ke & Stocker, 2019). Furthermore, even with the availability of experienced nurses in the OR to guide novice nurses, some were not prepared to do so as they preferred to maintain their social position within the OR team, which they feared novice nurses might challenge in the future (Pupkiewicz et al., 2015).

The literature also indicated that healthcare organisations' efforts to continuously re-evaluate their nursing IPs to keep novice nurses up to date with the latest evidence-based

practices to allow competent patient care (Satku & Lee, 2016; Theisen & Sandau, 2013) have been hampered by inadequate staffing to guide novice nurses (Gellerstedt et al., 2018; Nour & Williams, 2019; Numminen et al., 2015). Besides, even with adequate support, Bisholt (2011) shared that patient safety could be compromised as there existed limitations when novice nurses practise under the direct supervision of their mentor and preceptor by simply mimicking a task. It hindered the development of learning and critical thinking, which interfered with novice nurses from making their own clinical decisions when left alone in the same clinical situation due to the lack of knowledge to react and take necessary actions (Bisholt, 2011; Halpin et al., 2017). It concurred with Arzani et al. (2016), who also added that nurses who newly join the OR with previous experience in other nursing units struggled to make clinical decisions when in a new environment due to the lack of exposure to a non-adjacent clinical scenario. Hence, it aggravated the competency crisis among NGNs (Kavanagh & Szveda, 2017).

Similarly, Marks-Maran et al. (2013) shared that even with the benefits of having experienced nurses to guide NGNs and NJNs during their transitional periods, it was described that constrained relationships between nursing preceptors relationships with preceptees further deteriorated the matter. For example, Marks-Maran et al. (2013) reported that 82% ($n = 36$) of preceptees indicated a lack of time and different shifts allocation with their preceptors to be challenging when meeting their learning needs. The findings concurred with other studies (Hussein et al., 2017; Wong et al., 2018). For example, one study recommended that the nursing profession devise the role of nursing mentors and preceptors by drafting a learning contract to meet learning needs within the contracted timeframe (Wong et al., 2018). In addition, the authors suggested hospital administrators take up the responsibility to meet NGNs regularly to understand their learning needs and disabilities (Wong et al., 2018). Marks-Maran et al. (2013) stated that such recommendations were

beneficial, as 68% of preceptors interviewed indicated that having their nursing preceptors alongside them during their practice hours has helped reduce their anxiety and stress levels. In addition, it concurred with one qualitative review, stating that a supportive preceptor alleviated the stress levels of nurses undergoing a transition to practice (Teoh et al., 2013).

Likewise, the National University Hospital (NUH) recruited 73 second-year Singapore residency nurses to measure these graduate nurses' perceptions of the structured one-on-one mentorship programme they received during their transitional period (Tiew et al., 2017). Using the NUH-ME 10-item scale, the study reported that the availability of mentors throughout the 12-month transition helped NGNs' socialisation at work, contributing to NGNs' understanding of organisational culture and career advancement period (Tiew et al., 2017). Nonetheless, there were concerns from the hospital on cost and resource utilisation with the continuity of providing such one-on-one mentorship programmes (Tiew et al., 2017). Another study correspondingly shared that providing extra supervision for novice nurses could be costly (Maguire, 2013).

The extant literature shared that OQNs faced similar challenges when transitioning to practice in their new clinical environment. However, these issues among these nurses were more distinct because they were already skilled and could pinpoint their challenges. Thus, research has identified two common issues OQNs faced during their transition. These included language barriers and cultural shock (Ohr et al., 2016; Okougha & Tilki, 2010; Zanjani et al., 2018). For example, Okougha and Tilki (2010) shared that although the need for an IP for OQNs was vital to transition to new practice cultures, the focus should also be present in training hosting nurses. It was so that hosting nurses would be ethnocentric and provide the appropriate introduction of their culture of nursing practice to OQNs (Okougha & Tilki, 2010). Moreover, recent literature studying OQNs in Singapore shared that the language barrier among new OQNs predominated with the English language (Ohr et al.,

2016; Zanjani et al., 2018). It further developed OQNs' inability to inculcate effective learning when a language barrier existed (Ohr et al., 2016; Zanjani et al., 2018). Hence, OQNs with language barriers might feel isolated and excluded from hosting society as building relationships with their new country of practice becomes problematic (Zanjani et al., 2018).

Likewise, Crafoord et al. (2018) shared that language barriers among nurses in the OR would affect team dynamics. Thus, language barriers were an area of concern to be addressed, especially among NGNs and NJNs. It was especially vital in nations like Singapore, where the multicultural patient demographics could be the potential for patient harm increases due to communication issues (Chua, 2020). Furthermore, with the racial diversity among Singapore nurses, NGNs in Singapore found it more challenging when nurses perform handovers using languages besides English, the core language of communication in Singapore workplaces (Woo & Newman, 2020). Again, this could lead to potential harm as miscommunication might occur due to the lack of understanding of the language used during handovers.

Zhou (2014) also highlighted that the English language barrier China-educated nurses faced while transitioning to practice in Australia limited their ability to communicate, provide patient care and practice nursing skills. Although hospital interpreters were available, NGNs and NJNs could not depend on such services throughout their transition period. OQNs also addressed similar issues in other studies (Philip et al., 2015; Timilsina Bhandari et al., 2014). Therefore, the length of the IPs was vital for NGNs and NJNs, especially for OQNs, because the timeframe of each IP design allowed nurses the opportunity to learn the necessary cultural practices and views in a new clinical environment (Crafoord et al., 2018; Teoh et al., 2013; Woo & Newman, 2020; Zhou, 2014). Likewise, Ohr et al. (2016) shared that the availability

of OQNs could be advantageous in growing multiracial countries like Australia as the cultural awareness and language skills of OQNs would benefit immigrant patients.

Nursing IPs as a Retention Strategy

Based on the Casey-Fink Graduate Nurse Experience Survey, one study at community hospital in Georgia, USA, argued that with proper utilisation of nursing IPs, results showed a 100% retention rate of nurses (Maxwell, 2011). The same survey in other studies reflected a 78% and 100% retention rate of nurses for institutes with nursing IPs, respectively (Kowalski & Cross, 2010; Hillman & Foster, 2011). It concurred with past literature suggesting the establishment of effective IPs was a measurable outcome of nursing retention strategy (Baxter, 2010; Caliskan & Ergun, 2012; Wolff et al., 2010). Additionally, Strauss et al. (2016) shared that a sound support system during the induction period did correlate with a positive nurse retention rate. Hence, the findings from these studies concurred that IPs were helpful and valuable for NJNs of all nursing backgrounds.

Leong and Crossman (2015) similarly echoed that a positive nursing retention rate in Singapore was associated with a widely implemented OP in Singapore hospitals. Therefore, such shreds of evidence were promising for the nursing profession, especially in areas such as OR and CN nursing, where challenging retention rate was paired with poor recruitment rates (Ball et al., 2015; Foley et al., 2021; Monforto et al., 2020; Vortman & McPherson, 2021). Furthermore, recent research has stated that nursing retention would be crucial for the nursing workforce with a growing ageing population (Chua, 2020) and with the recent SARS-CoV-2 crisis globally (Lee et al., 2020). Hence, healthcare institutes should strategise on retaining nurses at the point of recruitment through effective IPs.

The use of nursing IPs as a part of a nursing retention strategy not only aids NGNs and NJNs with a positive role transition and clinical competence. The literature also cited that it aided healthcare organisations in reducing human resource efforts of nursing recruitment

and, again, most significantly, cost (Hillman & Foster, 2011; Odland et al., 2014). It concurred with the earlier discussion over cost utilisation concerns to conduct one-on-one mentorship programmes for Singapore NGNs in NUH (Tiew et al., 2017). For example, Vortman and McPherson (2021) shared that training one novice OR American nurse could cost an estimated \$12,000. On the other hand, NSI Nursing Solutions, Inc (2021) reported that the cost to train one American bedside RN was estimated to be \$40,038. It resulted in an annual loss between \$3.8 million and \$6.5 million each financial year (NSI Nursing Solutions, Inc, 2021). Additionally, Chappy et al. (2016) added that the extent to which speciality areas, such as the OR unit, needed to run their OP, which could generally take up to six to twelve months, was cost-concerning.

Similarly, Leong and Crossman (2015) shared that although figures were not available on actual cost loss in Singapore nursing retention, such issues had caused challenges in designing appropriate IPs to aid nursing retention. However, Chappy et al. (2016) argued that allowing new nurses to gain the necessary skills and knowledge was necessary. Thus, NSI Nursing Solutions, Inc (2021) shared that a positive turn on each percentage in nursing retention, with a supportive argument from the extant literature such as Chappy et al.'s (2016), was reported to save the hospital an average of \$270,800 a year. Hence, suggesting a positive investment return when retention of nurses was low within an organisation.

Length of Nursing IPs for Effective Learning

Besides using IPs as a strategy for nursing retention, the length of delivery for nursing of IPs has shown to play a significant role for novice nurses to gain the required skills and knowledge to gain clinical confidence and competence in their nursing practice area (Chappy et al., 2016). It concurred with the extant literature stating that although the length of IPs might vary in different countries and speciality nursing units, IPs were developed for new

nurses to understand their job roles and organisational needs; hence, the length was dependent on these factors (Al-Awaisi et al., 2015; Monforto et al. 2020; Rush et al., 2013; Vortman & McPherson, 2021). Based on the review of the literature, researchers have expressed that the delivery of IPs varied from six days to one year (Aldosari et al., 2021; Pertiwi & Hariyati, 2019; Vortman & McPherson, 2021). Although the first six months were stated to be a crucial period for nurses' transition (Rush et al., 2013), authors in the literature suggested that for effective learning to occur, the length of IPs should be run between six months to one year (Baldwin et al., 2016; Kowalski & Cross, 2010; Chappy et al., 2016; Maxwell, 2011; Rush et al., 2013; Vortman & McPherson, 2021).

Strauss et al. (2016) also shared that the length of the IP not only helps novice nurses learning capabilities. It formally supported these nurses to connect with peers and build on individual needs within the new clinical environment. Likewise, Teoh et al. (2013) shared that in each new clinical area, nurses must unlearn old cultures of the previous settings and promptly learn the new. It was primarily relatable to senior nurses transferred to different clinical settings. Yamaguchi and Sakai (2019) shared that unlearning was vital. After all, it removed old ways and helped acquire new knowledge. The realisation of the unlearning process occurred when an individual understood that the task was different from what was routinely done (Yamaguchi & Sakai, 2019).

Furthermore, with clinical practised hours reduced in student nursing to focus more on the theoretical aspect of nursing (Graf et al. 2020), the length of nursing induction has been crucial for transitional periods. Nour and Willams (2019) concurred with the literature stating that the induction length allowed NGNs to socialise in their new practice settings. Furthermore, an IP that extended for 12 months improved NGNs' and NJNs' work satisfaction and promoted retention rates (Hussein et al., 2017). However, it was unclear whether it promoted loyalty to the role as evidence of such findings was limited to a year of

employment (Aldosari et al., 2021). Therefore, the timeframe given to NGNs and NJNs for knowledge and skill acquisition should not be undermined. Hence, IPs that benefited from these factors would come to fruition when carefully integrated (Vortman & McPherson, 2021).

In Singapore, Woo and Newman (2020) reported that NGNs found that the 12 months induction period has helped provide them with an adequate timeframe to transition to professional practice successfully. Therefore, the length of the IPs was essential for new nurses in Singapore as the failure to transition after their probation period successfully could be met with repatriation (Woo & Newman, 2020). These concerns were unique in specific Asian nursing workforces like Singapore, as nurses were offered scholarships and sponsorships as student nurses by the local hospitals. In return, these nurses were required to sign a bond with the local hospital sponsor for a period ranging from three to six years (Chua, 2020; Woo & Newman, 2020). Thus, the fear came with the need to repay these scholarships or sponsorship if they did not meet the competency criteria to practice professionally.

Nonetheless, although the timeframe of IPs could provide new nurses acquiring new skills and knowledge, the new clinical environment contributed to significant challenges for NGNs and NJNs in their transition. Firstly, preceptors, mentors and senior nurses were less likely to be willing to fully commit to guiding novice nurses after six months, as the burden of emotionally and intellectually guiding novice nurses was laborious and would magnify after a long period of correcting learning disabilities (Ke & Stocker, 2019). This issue was concerning in OR units as orientating and inducting novice OR nurses to be functional in the OR unit could take five to six times longer than the timeframe to achieve this in a commonly exposed nursing unit (Ball et al., 2015). It was due to the multiple clinical roles OR nurses performed, such as scrub and circulating nurse (Martin, 2011).

Furthermore, one case study shared the labour-intensive aspect of being in a nursing teaching role in hospitals: the multiple roles that nursing faculties had to uphold (Thomas et al., 2019). For example, in one case study, a lead nursing faculty shared that the unexpected demands of the multiple roles nursing faculty were required to uphold could be overwhelming and exhausting, resulting in burnout among nursing faculties in healthcare institutes (Thomas et al., 2019). Besides, as shared earlier, threats to job security have also reduced the eagerness of experienced nurses to share their nursing skills and knowledge with newer nurses (Pupkiewicz et al., 2015).

Conclusion

In summary, TSPs were a critical aspect of nurses' journey when they transitioned into professional practice. Regardless of the cohort of nurses transitioning, the literature has shared that TSPs imparted essential information and provided mandatory core training for nurses to begin their new roles and adapt as professionals. Furthermore, studies have shared that it reduced topic redundancy when various TSPs were available in healthcare institutes by re-evaluating the structure and delivery of TSPs. It could reduce nurses' time inducted into a unit and an organisation. Additionally, it improved the efficiency of nursing faculties and acknowledged the cost-savings of the organisation. Although the literature suggested that the exact length of IPs remained unclear, other researchers have shared findings to suggest the optimal time frame for basic knowledge and skills acquisition for NGNs and NJNs to occur. The following section of this literature review looked in-depth into OR nursing and the challenges OR nurses face in reaching competence and confidence and explored measures recent studies had taken.

OR Nursing Practice

As discussed in the previous section, IPs, OPs, and other forms of TSPs designed to ease nurses' transition to practice have reflected various positive measures for nursing

retention and clinical learning experiences. However, as the literature stated, nurses have faced issues transitioning from nursing students to professional nurses despite exposure to general nursing practices such as ward-based clinical nursing. Furthermore, the literature shared that these issues arose due to gaps in theory to practice, which have led to NJNs and NGNs into culture shocks as they were burdened with responsibilities not exposed in previous clinical experiences (Al Awaisi et al., 2015; Ke & Stocker, 2019; Odland et al., 2014; Woo & Newman, 2020). These issues further intensified in speciality care areas such as the OR units, where student nurses had missed out on the opportunity to be exposed during their clinical placements (Foran, 2015; Elley, 2016; Inne & Calleja, 2017; Vortman & McPherson, 2021). Thus, many authors have supported the continuing existence of IPs, OPs and other forms of TSPs, as these were essential components of professional development and skill acquisition.

The AORN (2021) shared that OR nurses faced constraints with OR nursing education. As with other speciality care settings, OR nursing practices possess unique technical proficiencies (Sørensen et al., 2014). It was due to the complication of OR nursing practice with the technical nature of the profession, which made the transition to practice particularly complicated even with expert nurses with other previous nursing unit experiences. These nurses must inevitably unlearn previous practices and revert to novice nurses as they learn to adapt to a new clinical speciality (Martin, 2011). Furthermore, mastering machinery and equipment while focusing on surgical procedures has become the reality of perioperative nursing practice. Thus, it demanded interaction with technology to provide holistic nursing care (Martin, 2011; Smith & Palesy, 2018). This interaction was crucial in OR nursing because a lack of competencies and confidence might affect a nurse's ability to work and collaborate with other staff and technologies and potentially put patients at risk (Ingvarsdottir & Halldorsdottir, 2017; Sørensen et al., 2014). Thus, it was essential for

nurses keen to join or be placed in the OR nursing unit to equip themselves with an OR nursing background to build a foundation to practice in the OR competently (Wilson, 2012; Zinn et al., 2012).

Competence in OR Nursing Practices

The literature described competence in nursing as the foundation of a nurse's role in a unit where they could practice the necessary skills and appropriate knowledge to provide competent patient care (Leung et al., 2016; Wang et al., 2016). One study shared that the competency index helped measure nurses' competency level (Wang et al., 2016). Rabie et al. (2020) suggested this involved three domains: i) knowledge, ii) skills, and iii) attitude. It concurred with earlier discussions in the literature review, describing competent nurses as individuals who became more clinically aware of their nursing environment and have developed long-term personal goals (Benner, 1984). This level was generally achieved after two to three years of professional nursing practice (Benner, 1984). Existing literature concurred with Benner, sharing that it was estimated that OR nurses remained in OR nursing for at least two to three years to reach OR competent nursing level (Ball et al., 2015). However, other scholars have argued that nurses' competence level was achieved after gaining the ability to take full accountability for their professional role, a level that novice and advanced beginner nurses previously could not (Garside & Nhemachena, 2013). Furthermore, this process might take longer in OR nursing due to the multiple nursing roles required (Ball et al., 2015; Martin, 2011; Sherman, 2015).

A body of literature mentioned that nursing competency that has helped measure nurses' competence level was not comparable to nursing exams that measure nurses' education as professional nursing competencies go beyond student nursing clinical placement practice objectives (Hillman & Foster, 2011; von Vogelsang et al., 2019). Furthermore, the most significant disadvantage of such competency measuring tools for novice nurses joining

the OR unit was how nursing educational institutes have reduced or removed OR nursing rotation from the curricula to focus on other nursing areas (Beitz, 2019; Gregory et al., 2014; Sherman et al., 2014). It added to the misinterpretation of OR nursing by other nursing experts as a profession that acted only as a surgeon's assistant (Blomberg et al., 2015). The ignorance was due to these nursing experts' lack of exposure to the OR units (Blomberg et al., 2015). Therefore, the technical proficiencies that underpinned OR nursing practices and the procedural and medical aspects that embodied the dynamics of OR competencies became unknown to novice OR nurses (Wilson, 2012). In addition, the broad uncertainty of the OR environment that required OR nurses to be ready to make prompt clinical decisions to reverse patient harm was also affected by a lack of situational awareness and experience (Arzani et al., 2016; von Vogelsang et al., 2019). Hence, OR nursing competencies, like other speciality care units, became indispensable to practice in the area (von Vogelsang et al., 2019).

Besides, nursing competencies used to measure OR nurses' non-technical and technical skills for OR nursing care are described by OR nurses as manifold (Ingvarsdottir & Halldorsdottir, 2017). The stressful, challenging clinical environment (Işık et al., 2020) and hierarchal structure that was present in the OR unit were the main contributors that disabled new OR nurses' ability to learn the handful of knowledge and skills that were required for job competence (Pupkiewicz et al., 2015; Stephens et al., 2017; Wilson, 2012). What added to these issues were experienced OR nurses who did not openly pursue jobs available in OR units (Wilson, 2012). Therefore, to create a competent OR unit, nurse educators and leaders had to orient nurses who lacked OR clinical experience to function competently, even though it was time-consuming and costly (Wilson, 2012).

Perioperative nursing bodies have also put much effort into enhancing novice OR nurses' competence and confidence. For example, in the US, the AORN developed a formal specialised training programme in 1997 (Martin, 2011) to educate novice OR nurses' with

OR nursing foundations (Byrd et al., 2015; Tschirch et al., 2017; Vortman & McPherson, 2021). Before such efforts, perioperative educators in the US and other countries have used their personalised OR programmes to train novice OR nurses to gain OR nursing competencies (Martin, 2011). However, other countries continued to train and measure novice and experienced OR nurses' competence based on their own cultural and population demographics to meet the clinical needs of their patients' profiles. Nonetheless, efforts to produce formal specialised training programmes for OR nurses have received positive receptions because of the supportive collaboration by nursing stakeholders (Tschirch et al., 2017).

For example, a discursive study by von Vogelsang et al. (2019) discussed six core competencies to measure Swedish OR nurses' competence in delivering safe patient care. The six core competencies were based on the Institute of Medicine (IOM, 2003) and the Quality and Safety Education for Nurses standards (Cronenwett et al., 2007) (Appendix E), including i) patient-centred care, ii) interdisciplinary teams, evidence-based practice, (iv) quality improvements, v) safe care, and vi) informatics. The model was hierarchically structured based on a patient's operation journey. As a patient was unknown to OR nurses before an operation, a nurse-patient relationship was only developed during a small window before a patient underwent sedation or anaesthesia (Arakelian et al., 2017). It allowed the OR nurse to understand the patient's medical history, problems, and concerns, aiding the OR nurse in tailoring and enhancing the patient's care based on individual needs (Sandelin & Gustafsson, 2015). The first stage of the general six core competencies model allowed OR nurses to follow suit to the other levels to deliver optimal OR nursing patient care for individual patients. IOM (2003) stated that the model was useable for other nursing fields and should be possessed by all healthcare professionals. However, OR nursing goes beyond these six core competencies of basic nursing care; as informed by research, the technical aspect called for a

broader understanding of OR nursing (von Vogelsang et al., 2019). Similarly, other authors concurred that OR nursing competence should include technical and non-technical skills (Ball et al., 2015; Cavdar et al., 2019; Ingvarsdottir & Halldorsdottir, 2017; Saletnik, 2018; Smith & Palsey, 2018). Hence, researchers have recommended that OR nurses comprehensively acquire knowledge and skills (Cavdar et al., 2019; Ingvarsdottir & Halldorsdottir, 2017).

Another Swedish study investigating how Swedish OR nurses self-rate their clinical competence revealed that the positive relationship between academic degree and professional experience were the two essential indicators for OR nursing competence (Blomberg et al., 2019). The results from the open-ended study section also identified two themes that either promoted or hindered clinical competence. Of the 303 participants, 66 (21%) gave answers to the open-ended questionnaires. One OR nurse reflected that an academic degree was essential to understanding the scientific aspect of OR nursing, as education received in OR units was mainly focused on the technical skills aspect of the job (Blomberg et al., 2019). It echoed a paper by von Vogelsang et al. (2019) on the importance of acquiring technical and non-technical skills. Also, the nurses found interprofessional meetings beneficial in widening their knowledge and being updated with OR nursing practices (Blomberg et al., 2019). However, factors such as poor human resources, financial and time resources, and the lack of authority to influence decision-making within the OR team were the main hinderers to achieving clinical competence (Blomberg et al., 2019).

Likewise, a cross-sectional survey study was used in the UK to obtain the perceptions of OR nurses and operating department practitioners (ODP). A six-context-specific domain of perioperative competence that was similarly used in previous studies was measured using a 40-item *Perceived Perioperative Competence Scale-Revised* (PPCS-R) for these professional perceptions of self-competence in OR practices (Gillespie & Pearson, 2013). The competence

domain included i) foundational knowledge, ii) leadership, iii) collaboration, iv) proficiency, v) empathy, and iv) professional development. The results from the survey reflected that the 214 OR professionals who participated perceived themselves as having a high level of competence in their OR competencies (Gillespie & Pearson, 2013). Although this was positive for the OR unit, it resulted in identity and role ambiguity as nurses and ODPs overlapped in job tasks (Gillespie & Pearson, 2013). However, the other two domains from the survey helped separate OR nurses from ODP in other areas of OR competencies, for example, the statistical significance of the foundational knowledge and skills ($p < .002$) and empathy scale domains ($p < .0001$). It echoed recent literature that viewed ODPs' central role as OR "*technicians*" that were focused on procedural task compared to nurses who historically possesses the "*caring*" quality that transcends beyond the technical focus of OR patient care (Smith & Palesy, 2018). Hence, efforts had to be made to understand issues with role ambiguity to facilitate strategies to manage such concerns (Smith & Palesy, 2018).

Gillespie et al. (2018) conducted a cross-country follow-up survey from four countries to capture perceived perioperative competence (PPC) among OR nurses. The same PPCS-R tool was used with 768 respondents from OR nurses across Australia, Canada, Scotland and Sweden (Gillespie et al., 2018). The results showed that nurses with specialist qualifications, regardless of country of origin, had higher OR competence than nurses without (Gillespie et al., 2018). The findings reflected similar results from past studies that described the relative influence between self-reported competence and specialist or speciality education (Gillespie et al., 2011; Gillespie et al., 2012). However, Swedish nurses who have been working for less than ten years, and to some extent, Australian nurses, reported lower PPC grades. Gillespie et al. (2018) suggested that the findings could relate to Swedish nursing cultural differences. Also, Gillespie et al. (2018) added that the extent to which nursing roles affected clinical competence remained ambiguous, and how it affected nurses'

PPC also remained unknown. Hence, Chang et al. (2014) suggested that competency-based management approaches should be administered to better assess nurses' competency levels and understand their strengths and weaknesses.

Across Asia, a study done in a Chinese OR unit by Wang et al. (2016) identified 22 OR nursing core competencies in four dimensions using a multi-approach method study, with the Delphi survey as the cornerstone of their study. Stage one of Wang's et al. (2016) study invited 18 OR nurses from an established general hospital in China to an individual semi-structured interview to understand the core component required in OR nursing competencies. The researchers later compiled the findings from the first stage. They forwarded it to 30 experts from various healthcare professionals to score the importance of each competency identified by the OR nurses. The findings reflected that specialised knowledge scored the highest (47.7%) dimension in OR nursing competency. It concurred with von Vogelsang et al.'s (2019) discussion on the importance of having specialised knowledge of OR nursing to understand its competencies, as the scope of practice within the OR unit required advanced knowledge of the human anatomy and disease processes. The other dimensions rated based on importance included personality (25.6%), professional ability (13.8%) and self-motivation (12.8%), which provided the implicit competence of OR nursing practices in China (Wang et al., 2016). Furthermore, the findings added to China's growing success in introducing competency-oriented human resource development to nursing administrators (Wang et al., 2016).

Similarly, a Singapore study was done to recruit OR nurses using convenience sampling in an acute public hospital to respond to a survey using two multiple-choice instrument tools to measure OR nurses' knowledge of reporting pressure injuries (PI) for OR patients (Khong et al., 2019). The study used two multiple-choice instrument tools: the pressure ulcer knowledge assessment tool, which included 26 items and the attitude towards

pressure ulcer prevention instrument, which included 13 items. The findings reflected that 28% of nurses ($n = 90$) who participated in the study reflected a lack of knowledge regarding self-reporting knowledge and attitudes to PI of OR patients (Khong et al., 2019). Khong et al. (2019) shared that despite the findings reflecting positive attitudes towards the prevention and management of PI, they did not translate the knowledge and application of skills towards PI. The findings were similar to other authors who used the same instrument tools in Belgium, South Korea and Sweden to measure nurses' knowledge of PI care in other clinical areas (Beeckman et al., 2011; Demarré et al., 2012; Gunningberg et al., 2015; Kim & Lee, 2019). However, Khong et al. (2019) shared that despite OR nurses' disabilities in PI nursing care, the accountability and responsibility of OR nurses in preventing and managing PI of OR patients should be advantageous for nursing units to pursue OR nurses to obtain more knowledge. These studies identified self-assessment as one means of measuring OR nursing competence level.

Over the Middle East, 186 OR Irani nurses were recruited in a cross-sectional study to explore the relationship between clinical experiences and decision-making in the OR (Arzani et al., 2016). Using Benner's theory, Arzani and his colleagues identified a significant direct correlation between clinical decision-making skills, clinical experience level, and age. The study also determined that previous clinical experience outside the OR unit did not present a similar solution to an OR clinical environment and vice versa. The findings concurred with the extant literature regarding challenges nurses face with their skill set and knowledge when being redeployed to non-OR units due to the SARS-CoV-2 pandemic (Miljeteig et al., 2021; Prakash et al., 2020) and also past nursing experience before specialising in OR nursing (Crafoord et al., 2018). Such clinical rotations identified might not benefit novice OR nurses who specialise in OR units as it affected the continuity of learning for these nurses to develop OR nursing competence (Innes & Calleja, 2018). Additionally, the study by Arzani et al.

(2016) revealed no relationship between clinical decision-making and clinical experience in other units. Similar to other literature, the findings might be related to the maturity level in caring that allowed nurses to make rational clinical decision-making for patients (Crafoord et al., 2018; Gregory et al., 2014).

Similarly, one cohort study used Benner's theory to guide novice OR nurses into OR clinical practice as the principles of Benner's theory provided an existing pillar for professional development foundation (Gregory et al., 2014). The programme was a collaborative effort by the associate dean from the School of Nursing at the Medical College of Virginia Hospital and two OR nursing leaders. It was the first step to emulating OR nursing curricula in nursing schools (Gregory et al., 2014). The results from the externship programme were very positive. One hundred twenty nursing students participated in the introductory externship between spring 2007 and fall 2011. A consistent number of students (9 to 45) completed an addition to the externship programme at a later date (Gregory et al., 2014). Student nurses who completed the externship programme found it improved their critical thinking skills and set task priorities (Gregory et al., 2014). The externship programme's success also highlighted to school faculty members the importance of having an appropriate clinical experience aside from generalist nursing, especially for speciality nursing professional transition (Gregory et al., 2014). The programme was later inculcated into the nursing curricula to include a 15-week OR nursing clinical placement, which involved a minimum of six hours a week of OR nursing exposure (Gregory et al., 2014). The second part of Gregory et al. (2014) study explored restructuring the RN internship programme. Similarly, the programme results were positive, and the time frame of the internship was increased from six to nine months and included post-anaesthesia care unit rotation (Gregory et al., 2014). The study's findings identified the importance of having OR nursing content in

nursing curricula and provided novice OR nurses with the quality to provide competent OR nursing care (Gregory et al., 2014).

A similar OR internship programme was designed by OR managers and the Department of Nursing at Carlow University faculty members in Pittsburgh, Pennsylvania, to give student nurses clinical exposure to OR nursing under an OR nurse preceptor found similar findings (Nash et al., 2018). The summer internship programme, which was six weeks long and included 120 practice hours, was designed for OR clinical exposure aimed at student nurses to gain a better concept of OR nursing through understanding the nature of OR units, technical competencies requirements and interprofessional collaboration (Nash et al., 2018). The programme's outcome showed excellent success, with 87.5% ($n = 7$) of student nurses voicing their interest in considering OR nursing as a top choice upon graduation—the student nurses' level of competence towards OR nursing also showed improvement at the end of the programme. Skills and knowledge regarding stressing proper patient identification, understanding the sterile field, being a patient advocate, and proper patient positioning were core competencies of OR nursing gained after programme completion, which they previously did not possess (Nash et al. 2018). The significant difference between Gregory et al. (2014) and the Nash et al. (2018) programme was using the AORN Periop 101 programme to guide the interns. Although both programmes showed remarkable resilience and competence towards OR nursing practice upon graduation, only 7.5% – 10.83% of 120 students from Gregory et al. (2014) study completed the entire programme as compared to 100% ($N = 8$) from the Nash et al. (2018) study. Nash et al. (2018) suggested that OR novice nursing programmes should consider a smaller intake because it would provide novice nurses more attention time and better return rates to the OR unit after graduation. It was reflected in their study, which showed seven out of eight nursing interns considered pursuing a profession as an OR nurse. Furthermore, the Periop 101 programme has helped the interns' weekly didactic

sessions, improving the students' credibility and overall experiences as the format converged theory and practice of OR nursing (Nash et al., 2018).

Based on the literature reviewed thus far, research reflected that personalised competency programmes to assess OR nurse competence have successfully improved novice OR nurses' competence with OR nursing practice. As Nash et al. (2018) shared, Periop 101 has shown better OR nursing competence and retention success. Likewise, an earlier study by Wilson (2012) that explored redesigning OR orientation using the Periop 101 programme design shared similar findings. The redesigned OR orientation programme successfully retained 37 competent OR staff since the restructuring programme was initiated in 2006. The new design encouraged novice OR nurses and other OR partitioners, such as surgical technologists, to undergo the web-based Periop 101 course before attending practical skills with a preceptor (Wilson, 2012). The process aided the orientees in transferring theory into practice, and progression in OR practices was based on achieving a satisfactory competence level on a particular OR speciality. Pupkiewicz et al. (2015) similarly shared that progression in OR practices should only occur once a competent level was achieved in one clinic. Progressing before it was completed would result in an overload of learning abilities, thus causing a loss of confidence and increasing learners' anxiety (Pupkiewicz et al., 2015). Hence, it was essential to dedicate learning at a pace where knowledge and skills were achieved through a supportive clinical learning environment (Pupkiewicz et al., 2015).

Similarly, Byrd et al. (2015) shared that with the Periop 101 programme, OR nurse educators could monitor novice OR nurses' progress, allowing them to better plan to enhance the novices' clinical experiences. The responses from novice OR nurses were also positive with regard to the Periop 101 programme. Aside from issues with accessibility of the web-based curriculum due to poor internet connectivity, the programme participants have seen their competence level of OR practices improved by combining theory gained from the online

curriculum and simulation training (Byrd et al., 2015). Rogers et al. (2020) and Tschirch et al. (2017) similarly shared that recognising the need for student nurses' proper learning support for OR placements has led to collaborations between clinical partners such as universities, hospitals and the AORN. In addition, the fundamentals of OR nursing from the Periop 101 programme curriculum (see Appendix F), which was used, allowed nursing students to validate their competence level before OR clinical rotations and, thus, improved their clinical experiences during rotations (Tschirch et al., 2017). The fundamental modules were similarly used in Ball et al.'s (2015) study to explore new education models. Equivalently, student nurses validated their OR nursing knowledge and repeatedly practice skills until competence was reached before heading to real clinical settings (Ball et al., 2015).

Based on the extant literature, it was evident that the knowledge novice OR nurses gained through a structured OR introductory programme such as Periop 101 has led them towards achieving a higher level of OR nursing competence. Furthermore, it has allowed them to be perceived by their team members, especially surgeons, as being competent in their practices.

Confidence in OR Nursing Practices

The literature further suggested that achieving competence in OR nursing practices influenced the confidence of novice OR nurses in their practices. In addition, the literature stated that confidence in nursing practice correlated to proper guidance through structured programmes and a supportive learning environment (Byrd et al., 2015; Cotterill-Walker, 2012; Martin, 2011; Wilson et al., 2019). Thus, novice nurses in speciality care units such as the OR must display confidence in their practices. In addition, it was a commonly critiqued index to measure competence level. These included the ability to question and challenge practices (Warwick et al., 2021; Wilson et al., 2019) or intimidation in a working environment (Spruce, 2019).

Recently, however, OR nurses' confidence has been challenged by the expansion of new technologies in OR units (Sweeny, 2010). Although time was permissible for OR nurses to catch up with technologies (Stanton, 2011) and become excellent resource people, the reality seemed unachievable when new technologies were continually introduced in healthcare industries (Smith & Palesy, 2018). Furthermore, Sweeny (2010) shared that nurses' resistance to learning new technologies further limited their confidence in current practices.

In addition, the hierarchal nature of OR nursing has contributed to a lack of confidence in nursing practice among novice OR nurses (Stephens et al., 2017; Wilson, 2012). This problem was further magnified by the social isolation of new team members in the OR (Crafoord et al., 2018). Moreover, ill-treatment from surgeons has made nurses feel worthless and highly critical of themselves, decreasing their self-confidence (Freeling et al., 2017; Higgins & Macintosh, 2010). These issues were also affected by the overwhelming nature of the OR working environment, which decreased the OR nurses' confidence level as they could not deal with uncommon situations such as family bereavements during organ transplants, as one study shared (Smith et al., 2015a).

However, past studies have explored valuable methods to improve the confidence of novice OR nurses. For example, Pupkiewicz et al. (2015) shared that allowing novice OR nurses to perform the same procedure repeatedly would help them boost their confidence level as they became accustomed to the setup and process of the surgery. In addition, reassuring novice nurses that they needed to know the totality of OR nursing practice was a learning journey that reinforced their confidence (Maguire, 2013). Thus, when possible, consistency in learning should be made available for novice OR nurses to improve competence and confidence in their practices (Inne & Calleja, 2018).

The extant literature also shared that self-assessment of competence has allowed nurses to build confidence in completing work duties effectively, as they were aware of their skills and knowledge (Gardulf et al., 2016; Kajander-Unkuri et al., 2014). Beeckman et al. (2011) and Khong et al. (2014) similarly shared that confidence was an indicator of OR nurses' knowledge of their practices, which Gillespie et al. (2018) suggested helped nurses understand their strengths and weaknesses and got them more involved by engaging in learning and expanding educational pursuit. Furthermore, the socialisation that was involved in learning engagements in critical care areas such as the OR unit has shown a positive influence on novice nurses' transition to practice (Innes & Calleja, 2018; Monforto et al., 2020), which also helped empower decision-making skills (Işık et al., 2020). Additionally, novice OR nurses have found that undergoing perioperative courses has improved their confidence in OR nursing skills and knowledge (Schmidt et al., 2016).

Conclusion

In summary, OR nurses' competence and confidence in OR nursing practice have been reflected in the literature to perpetuate through self-awareness of individuals' strengths and weaknesses, learning engagement, furthering educational pursuit and socialisation in the workplace. Tools have also been developed to measure these indexes. In addition, research has shared that programmes such as the Periop 101 programme have helped pace the acquisition of new OR nurses' knowledge and skills. It has also helped nursing mentors, managers, and preceptors understand novice OR nurses' learning needs and competency levels. However, the continuing introduction of new technologies into healthcare industries, especially in the OR units, has threatened the future OR nurses' confidence and competence level as it hindered novices' retention of learning fundamental OR skills. Therefore, the next section of the literature review will focus on the motivation and barriers of nurses, especially in OR nursing.

Barrier and Motivation within OR Nursing Practices

In continuation of the previous sections, it was discussed that being competent and confident in OR nursing practice aided nurses in understanding their strengths and weaknesses. The literature shared that it has helped unveil the drive for nurses to find more insights into their practices by returning to nursing school to gain up-to-date nursing skills and theories. Furthermore, it made nurses more involved in learning within the clinical environment and healthcare organisation. This section will focus on looking beyond those themes and discussing the motivation drivers of OR nurses with their nursing practices. This section will also discuss the barriers that prevented them from progressing in their OR nursing practices and performances.

The literature described motivation as a goal-directed action derived from sustainable behaviours triggered by inspiration, direction and energised voluntary action (Lee & Raschke, 2016; Tovmasyan & Minasyan, 2020). Tovmasyan & Minasyan (2020) added that motivation was the primary responsibility of employers as they were the drivers to direct and sustain employees' actions. However, motivation in the nursing workplace could be challenging due to the uniqueness of each individual at work. Moreover, recent literature shared that the current SARS-CoV-2 pandemic has affected the motivation of employees as their mental health was affected by the pandemic fatigue, which has led them to be unable to properly function at a desirable level (Tovmasyan & Minasyan, 2020). It was especially alarming as nurses' roles as patient care providers were influenced by their mental health (Destiani et al., 2020). The motivational push among current nurses in the recent SARS-CoV-2 pandemic world was the support and solidarity of the public for their efforts during these challenging times (Veerapen & Mckeown, 2021). Thus, regardless of nurses' competence and confidence level that motivated them to attend work, especially during challenging health

crises, monitoring nurses' mental health was vital to ensure that patient care was provided safely.

The extant literature has shared that intrinsic and extrinsic motivations could easily recognise employees' motivational levels (Gill, 2011; Pinder, 2011; Tovmasyan & Minasyan, 2020; Whiteside, 2016). As informed by research, extrinsic motivations were influenced by multidimensional factors that benefited the individual (Legault, 2016; Whiteside, 2016). These included pursuing a higher education to improve monetary incentives or promotions (Goodare, 2017; Whiteside, 2016). On the other hand, intrinsic motivations were internal factors such as the desire to act on matters to gain positive outcomes and avoid adverse consequences (Kuvaas et al., 2017). Furthermore, among the many critical organisational performance indicators, motivation was an essential factor that reflects organisational and workforce performance (Jalagat Jr., 2016; Olusadum & Anulika, 2018). Kirilina & Parina (2017) said this phenomenon helped reflect employee loyalty. Furthermore, it indicated methods to improve the quality of retention within the organisation and gave credence to the organisational equilibrium (Olusadum & Anulika, 2018). However, Bindon (2017) shared that support was available regardless of intrinsic or extrinsic.

Motivation within OR Nursing Practices

Prior Learning

Kurimoto et al. (2020) stated that motivation within OR nursing practice plateaus after five to seven years. However, it would have already decreased after four to five years due to the inability to expand their clinical expertise after meeting the mastery of surgical technical skills. Previous studies have also shared the correlations between OR nurses' lack of motivation and prior reading about surgical procedures. For example, in the study of Pukiewicz et al. (2015), novice nurses' lack of motivation to do preliminary readings regarding surgical procedures was influenced by the preference for workflow and procedures

delivered through structured OPs. Furthermore, novice OR nurses complained that they found it challenging to do a return demonstration of skill performance only after observing it within the same day (Pupkiewicz et al., 2015). The motivation of these nurses was further hindered because OR nurses had high expectations of their colleagues and had a reputation for being judgmental (Wilson, 2012). Hence, novice nurses expressed that social acceptance was a key indicator for learning in the OR unit (Pupkiewicz et al., 2015).

Similarly, Wang et al. (2016) mentioned that self-motivation was the lowest-scored theme in OR nurses' core competency evaluation index. These included areas in autonomous learning, emotional control and stress coping. However, Foran (2015) pointed out that experienced OR nurses were more likely to involve novice OR nurses, such as student nurses, to participate in surgical procedures if they have shown initial motivation towards learning by mastering the surgical scrubbing skills, which was the essential fundamental skill of a scrub nurse.

Likewise, Işık et al. (2020) shared that stress-coping indexes, such as communication failures within the OR team, were related to the low motivation of OR nurses. It was due to institutional issues involving OR nurses with more responsibilities without providing them with the necessary staffing (Işık et al., 2020). Furthermore, Blomberg et al. (2018) shared that OR nurses' exclusion in the nursing process for patient care was a barrier to performing their roles dutifully as the surgical team did not take their competency level seriously. It became a concern as teamwork was vital in perioperative practice. Student OR nurses who were interviewed similarly shared that barriers to practising OR nursing in the future were the exclusion or lack of supervision during their OR nursing placements (Foran, 2015). However, students given proper guidance and opportunities during their clinical postings were more likely to consider returning to OR nursing after graduation (Foran, 2015). It concurred with Nash et al. (2018), sharing that guided exposure was the likely reason to reduce barriers to

OR nursing practices for novice nurses and increase the likelihood of joining the unit. Hence, it was essential to expose and involve OR nurses early in their careers to form relationships during clinical rotations, such as student nursing placements (Nash et al., 2018).

Fiscal Motivation

However, the literature also shared some discouraging findings that influenced OR nurses' motivation. For example, a body of literature pointed out that fiscal motivation played a significant role in enhancing nurses' performance and reason to retain and further their education and role in the nursing profession (Loftin et al., 2021; Ning & Costello, 2017; Warren & Mills, 2009). Similarly, one study reported that nurses placed wages as the top (first) motivator that rates their job satisfaction (Göktepe et al., 2020). Muthmainnah et al. (2019) similarly shared that nurses were not motivated to work because of the average remuneration rate provided by the hospital as compared to other health professionals. Thus, healthcare organisations should be wary of such tactics. Such methods would not alleviate the nursing profession but further broaden the gaps in issues leading to poor staff turnover, support and education catered in the OR unit (Leong & Crossman, 2015).

Moreover, fiscal motivation proved costly for healthcare organisations in the long term because of the investment to send nurses back to school or training to keep them in the workforce (Warren & Mills, 2009). Instead, they should focus on being innovative and encourage nurses to genuinely be self-motivated and upgrade themselves with the latest skills and knowledge to understand better the progressive health issues and demographics of today's patients so that nurses could have a sense of self-achievement that would ensure their job security (Støren & Hassen, 2011). As informed by the literature findings, even with higher remuneration to act as a fiscal motivator, it is ineffective if other healthcare workers are being paid more for doing lesser roles.

Despite the negative motivators found in the literature, a recent study in New Zealand has shed some positive light on positive motivation factors that have kept Generation-Y OR nurses in the profession. Jamieson et al. (2015) shared that recognition, work itself, career advancements, and achievements were the most common reasons for Generation Y nurses to remain in the OR nursing profession. Similarly, Generation-Y nurses who chose to be part of other nursing specialities shared that the philosophy of the nursing profession and ethics towards patient caring were motivators towards their interest in the profession (Christopher et al., 2015).

However, the concerns were working conditions such as poor staffing, work-related stress and poor job satisfaction that pushed these nurses away (Jamieson et al., 2015). Akin to the previous section's discussion about fiscal motivation, one study shared that providing monetary incentives has been a poor motivator to compensate for these issues for Generation-Y nurses as they value work-life balance over poor working conditions (Chung & Fitzsimons, 2013). It concurred with Knowles et al. (2015), who added that adult learners learned better when they were aware of the benefits of their actions rather than monetary rewards. Besides, Jamieson et al. (2012) shared that no evidence supported the idea that taking pleasure in their job contributed to long-term commitment towards the OR nursing profession. Thus, despite nursing retention being the top priority in healthcare organisations (Shaffer, 2014), responsible nursing bodies should understand the push and pull factors to motivate OR nurses to remain in the OR profession. Furthermore, they should develop the appropriate strategies to target those factors (Jamieson et al., 2015).

Similarly, in their study, Støren and Hassen (2011) shared very high responses from OR nurses regarding why they were motivated to be a part of OR nursing. For example, 85.6% ($n = 77$) and 87.8% ($n = 79$), respectively, rated the ability to help others and being helpful to others as the motivators to become an OR nurse. They also found that 97.8% ($n =$

88) of respondents responded to OR nursing to be interesting. For example, one respondent shared that the creativity and independence that OR nursing brought developed the niche as a highly-skilled nursing professional (Støren & Hassen, 2011). It agreed with Kunic and Johnson's (2013) study, stating that specialist professionals like OR nurses would be in high demand as the healthcare industry advances.

Respect

A body of literature also suggested that OR nurses were more motivated to be team players within the OR team when they were given respect from different professionals of different levels within the team (Massoco & Melleiro, 2015; Tondo & Guirardello et al., 2017; Wegner et al., 2016). For example, Gutierrez et al. (2018) shared that non-nursing team members such as surgeons and anaesthetists function based explicitly on their speciality without any active involvement with an organisational patient safety discussion. Thus, the motivation for OR nurses in their workplace practices was to create a safety culture for patients and other professionals through effective communication and collaboration (Gutierrez et al., 2018). Giving the autonomy to make decisions within the OR team gave nurses a sense of respect as their opinions were heard and considered. It concurred with the earlier discussion in this chapter concerning the relationship between motivation to learn and social acceptance (Pupkiewicz et al., 2015).

Likewise, OR nurse managers interviewed in one study shared that their motivation to remain in their role was the belief that despite their demanding position in the OR unit, the fear of failing was the pushing factor (Arakelian et al., 2020). Also, Arakelian et al. (2020) pointed out that nurse managers stressed the importance of showing respect to employees so that positive relationships could be built for the benefit of both parties. In return, the nurse managers felt that their actions had led them to gain the respect and trust of their employees. Hence, it allowed them to offer ongoing administrative and emotional support (Arakelian et

al., 2020). It agreed with other studies that shared the sense of togetherness that benefited nursing managers and their teams (Gutierrez et al., 2018; Honkavuo et al., 2018). However, these were not achieved only through the fear of failing and stressing the importance of respect among co-workers. Nurse managers voiced that they needed support from their senior leaders and building their strength to rise in difficult situations (Arakelian et al., 2020).

Barriers within OR Nursing Practice

Technological Advancement

Research has found that despite the OR unit being an exciting work environment, barriers that have hindered OR nurses when practising in the unit exist. The main barrier the literature shared hindering OR nurses' progression was technological advancements (Blomberg et al., 2019; Luck & Gillespie, 2017; Smith & Palesy, 2018; Uslu et al., 2019; Wilson, 2012). It was coupled with a newer generation of learners in the nursing workforce, professional expectations and delivery of nursing education that have also changed (Logan, 2012; Martin, 2011). It was because the learning styles have evolved in every generation, and gone were the days when OR nursing care was just focused on the patient itself (Martin, 2011). Moreover, Sweeney (2010) shared that many present technological systems were not designed to address nurses' everyday needs. Instead, the focus has shifted to the medical aspect of healthcare needs. Thus, it has led to OR nurses struggling to manage previously routine tasks.

Additionally, due to the advancements in the healthcare industries, such as the introduction of robotic-assisted surgery (RAS), the before, during, and aftercare of patients undergoing surgery have also been altered (Luck & Gillespie, 2017). The evolution has made competent nurses adapt to new skills, and interestingly, deskilling them as their participation in RAS has been reduced with surgical robots (Luck & Gillespie, 2017). Similarly, Uslu et al. (2019) shared that in some cases, nurses involved as scrub nurses during RAS felt less critical

as the robot has taken priority over some concerns they might have, leaving the nurse's role in surgery ambiguous.

Smith and Palesy (2018) also shared that OR nurses interviewed in their study expressed that technological competency has been prioritised over nursing core competency within the OR unit because of the different knowledge required in surgeries involving medical technology. These included the knowledge to recalibrate the robot if an error arose, react to emergencies when robotic surgery failed, and direct the team to proceed with hands-on (traditional) surgery (Luck & Gillespie, 2017; Uslu et al., 2019). Again, gone were the days when OR nursing practices were centred solely on patient care. Instead, it has been linked to the need to be equipped with the medical technology knowledge required to deliver optimal patient care (von Vogelsang et al., 2019). However, one study pointed out that the constant presence of nurses equipped with RAS know-how helped reduce recalibration time when mechanical issues arose with the robot (Pinto et al., 2018). Furthermore, it also accurately assessed human resource and education needs in RAS (Pinto et al., 2018). Hence, the challenges nurses faced with RAS, which included new competency, team building and patient safety concerns, were reduced when specialist RAS were present (Pinto et al., 2018).

However, in a highly intense technical unit and at the speed at which technology has been advancing in the healthcare industries, it was surprising that the OR unit still lacked basic information technology like internet access for computer research (Duff et al., 2014; Sweeny, 2010). Recent literature shared that it was a crucial issue OR management should address as accessibility to computer research was vital for OR nurses to ensure that sufficient evidence-based knowledge was readily available for safe patient care delivery when in doubt (Spruce, 2019; von Vogelsang et al., 2019). Besides, with more hospitals moving towards a paperless environment, the accessibility and availability of internet connectivity and computers were essential for patient data traceability to ensure the safe delivery of patient

care (Swedish Institute of Standards, 2019). Moreover, the ERCI Institute 2017 report shared that one of the top 10 patient safety issues in the OR unit responsible for the direct implication to OR patient safety was the incompatibility of information technology systems with hospital workflows (Mower, 2017). Thus, healthcare industries had to ensure that technologies purposefully introduced to enhance hospital workflows and patient care were relevant and available.

Søndergaard et al. (2019) similarly shared that documentation practices among OR nurses were low because the accessibility of documentation systems such as computers was inconveniently located. Furthermore, at the rate technology has advanced within the healthcare industry, OR nurses were pressured to attend more to new technologies (Pinto et al., 2018). Therefore, it became a detailed index that dominated OR nurses' practices rather than handling documentation entries as time allocation for the task was hindered (Søndergaard et al., 2019).

Political and Generational Practice Difference

Recent studies have also identified that the political and generational differences have led to conflicts among OR nurses, which has led to implications in their practices. For example, a survey by the American Association of Nurse Anesthetists shared that 43% of Certified Registered Nurse Anesthetists members felt that the political aspect of their job contributed to work-related stress, and 33% felt disrespected in their roles. These issues, in the end, contributed to prolonged stress that mismatched the demands and resources available to perform their roles efficiently (Del Grosso & Boyd, 2019). Furthermore, surgeons and scrub nurses dominated the OR more, leaving nurse anaesthetists lonely because interactions and work function were reduced during surgery (Eskola et al., 2016). The isolation and dominance have further led nurse anaesthetists to have higher stress levels as they felt their role during surgery became ambiguous (Eskola et al., 2016). Wilson (2012) similarly shared

that the hierarchal nature of the OR unit has increased the stress level of OR nurses and confidence in the practices that hinder work delivery. It agreed with other literature sharing that the hierarchal structure of the nursing profession, in general, has led to many cases of workplace bullying, thus affecting nurses' work performance and organisational and patient outcomes (Anusiewicz et al., 2019; Chang & Cho, 2016; Spruce, 2019).

The generational gap within the nursing profession has also led to differing nursing practices. The older generation of nurses has developed routines and habits within the OR workplace that hindered the younger generation of OR nurses' development (Blomberg et al., 2019). It included the need to develop a nurse-patient relationship that remained unclear to younger generation nurses (Blomberg et al., 2019). Besides, the younger generation did not view work as their life but as a place to be socially connected to their peers (Jamieson et al., 2015). It was far compared to the older generation of nurses who joined the nursing profession for unselfish and idealistic reasons (Logan, 2012). Therefore, the turnover rate of younger nurses after 12 months of joining the profession was higher due to the lack of capacity to handle work-related stressors (Jamieson et al., 2015).

Task Distractions

Past studies have also shared that task distractions have contributed to barriers within the OR nursing practice. For example, a pilot project initiated in the OR at Massachusetts General Hospital, Boston, shared that supervising equipment technicians with their roles pulled OR nurses away from their primary responsibilities and delivery of direct patient care (Hemingway et al., 2010). Furthermore, the OR unit's language barriers extended this issue as communication became time-consuming (Hemingway et al., 2010). Thus, nurses felt it affected team dynamics (Crafoord et al., 2018). It concurred with other literature stating that the time-pressure environment with interruptions and distractions hindered their focus on providing optimal patient care (Ingvarsdottir & Halldorsdottir, 2017; Koh et al., 2011). In

addition, task interruptions would require the nurse to react to lost time in task performance, thus invoking stress and leading to errors (Nützi et al., 2015).

Similarly, a case study in a large urban hospital in the Netherlands found an interesting phenomenon between mobile technologies, such as handphones, and OR nurses' work performances, which caused task distractions (Sergeeva et al., 2016). It was the first study to explore the phenomenon related to task distractions associated with mobile technologies in the OR. The findings shared that although mobile technologies such as handphones have intended purposes for work-related activities such as making notes and reviewing medications, the unintended use of these devices has led to distractions to collaboration, hands-on learning and performing clinical care tasks (Sergeeva et al., 2016). In addition, these devices were more frequently used for personal usages, such as personal text messaging and logins into social media (Sergeeva et al., 2016). Besides, the unnecessary use of mobile devices might lead to a lapse in concentration (Feuerbacher et al., 2012) and increased the likelihood of adverse patient outcomes such as incorrect surgery sites and patients. However, on a positive front, it was found that using personal devices to occupy OR nurses' time during stable procedures provided them with better job satisfaction and well-being (Sergeeva et al., 2016).

Mobile devices were not the only culprit for task distractions in the OR unit. Interestingly, conversational and procedural interruptions were among the contributing themes causing task distractions. An observation study shared that of 107 procedures observed, at least once in 69.2% ($n = 74$) of those surveyed were interrupted by conversations (Gillespie et al., 2012). In contrast, one in 66.4% ($n = 71$) observed was caused by procedural distractions (Gillespie et al., 2012). Although there was a limit to the depth of OR nurses' and team members' understanding of the variables of work conditions, the depth of understanding task distraction remains imperative (Gillespie et al., 2012).

Burnout

The results of task distractions, technological advancement, and political work issues such as learning opportunities and social support have led to many burnout nurses within the OR unit (Chard, 2010; Vander Elst et al., 2016). Burnout within nursing research has been extensively explored. The literature has shared it as one of the main contributors to the barriers to practising OR nursing effectively (Del Grosso & Boyd, 2019). Furthermore, it affected workers and the organisation (Schaufeli et al., 2017). However, as it has been researched extensively, nursing scholars recently did not consider it an emerging phenomenon but an occupational hazard in the healthcare industry (Del Grosso & Boyd, 2019).

The literature has also outlined NGNs' being faced with the burnout phenomenon. Susceptible to rotating shifts, many younger nurses felt the profession's impact on the work-life balance (Jamieson et al., 2013). Adding in negative work issues such as increasing job demands in the healthcare industry, poor staffing and decreasing job satisfaction, many hospitals have reported nurses leaving the profession only after 12 months of being on the job (Jamieson et al., 2013). Also, Støren and Hassen (2011) shared that despite 71.1% ($n = 64$) of OR nurses who were surveyed stating that they were motivated in their roles with patient interactions, only 30% ($n = 27$) agreed that they joined the profession to provide optimal psychosocial support to patients. Furthermore, despite establishing post-hire transition programmes (Caliskan & Ergun, 2012), the high level of burnout among younger OR NGNs were factors contributed by bringing in unprepared nurses into the nursing workforce (Rudman & Gustavsson, 2011) and high professional expectations (Gantz et al., 2012).

Similarly, senior nurses have faced burnout issues in present-day nursing practice due to the higher workload and greater responsibilities (Foley et al., 2021). For example, an Australian study shared that patients who required community care presented in hospitals

added to this issue as they occupied hospital beds requiring nursing resources and a workforce to manage (Foley et al., 2021). The fear among OR nursing staff living in the uncertainty of the SARS-CoV-2 pandemic world was the backlog of elective surgeries that would be presented once all elective surgeries were safe to proceed at a pre-pandemic rate. It concerned OR nurses as the unit was already acknowledged as highly stressful, with burnout as a common phenomenon (Niasar et al., 2013). With the backlog of elective patients that would present later, nurses foresaw added workload and a higher chance of burnout due to the lack of OR skilled nursing staff.

However, Li et al. (2021) suggested that OR nurses suffered a moderate level of burnout compared to general nurses. In the findings of Li et al. (2021), 46.2% ($n = 235$) of OR nurses rated their burnout as moderate. Furthermore, the authors shared that the manifestation of burnout was the relationship between a low level of work commitment contributed by work-related stress and experiencing emotional exhaustion (Li et al., 2021). The findings were similar to existing literature exploring the burnout of other general nurses (Chen et al., 2021; Hayes et al., 2015). The reason was that when continuously faced with high stress levels, burnout of nurses with lower commitment levels became more apparent (Li et al., 2021; du Prel et al., 2018). It was so because they did not seek high respect and recognition for their work compared to nurses with higher commitment levels who were more resilient (Li et al., 2021; du Prel et al., 2018).

Comparable to other studies, it was found that emotional exhaustion that led to burnout among OR nurses was related to poor staffing, social support, and leadership (Jamieson et al., 2012; Sillero & Zabalegui, 2018). However, akin to Li et al.'s (2021) study, nurses surveyed in a cross-sectional survey study at a Spanish university in Barcelona found burnout among OR nurses to be moderate (Sillero & Zabalegui, 2018). However, the three dimensions that surfaced became a significant concern for OR nurses as they could not meet

the demands of performing their work (Sillero & Zabalegui, 2018). Previous literature examining a similar topic suggested this posed the risk of increasing nurses' level of burnout (Aiken et al., 2013; Prezerakos et al., 2013). However, Del Grosso and Boyd (2019) shared that regardless of the index measuring burnout among nurses, exhaustion seemed to be the centralised phenomenon contributing to the matter. Again, this concurred with the existing literature (Li et al., 2021; Niasar et al., 2013; Odland et al., 2014).

Conclusion

In conclusion, the extant literature exploring the motivation of OR nurses lacked depth. Moreover, the availability of studies sharing motivation within OR nursing practices seemed to deviate from the positive aspects OR nurses could gain towards the issue. Regardless, OR nurses should be resilient and ascertain their reasons for joining the OR nursing workforce. Furthermore, the depth of barriers to OR nursing practices raised many concerns. In some of those barriers discussed, it was no longer considered an index of concern. Thus, the OR nursing profession should keep abreast of merging current technologies, health crises, and the generational gap to motivate OR nurses with their practices and reduce barriers that could hinder them. The last section of the literature review will discuss nursing retention in perioperative nursing and explore retention strategies from current nursing literature.

Nursing Retention

Thus far, the author has discussed themes associated with the challenges OR nurses have faced as professionals and novice OR nurses that have impacted their daily practices. The literature review has followed the journey of those challenges and impacts, which began in the transition to the practice followed by nursing IPs, competency and confidence in perioperative practices and the motivation and barriers of OR nursing practices. The final section of this literature review explored available literature on retention within nursing and

OR nursing in a global and Singapore context. This section will first cover nursing shortfalls issues globally and in Singapore, as well as strategies healthcare organisations have implemented to retain nurses.

Global Nursing Shortfall

The WHO recently reported a shortfall of 5.9 million nurses globally to meet the workforce demands to deliver hospital patient care worldwide (WHO, 2020a). Globally, nursing shortages have been recognised in all areas of nursing. Similarly, a survey study conducted by AMN Healthcare (2020a) reported that at the time of the study in 2018, chief nursing officers (CNOs) were concerned over the current worsening shortages of nurses that would continue for another five years. More than 80% of the CNOs indicated that the challenges of recruiting nurses into their organisation were moderate, significant or severe (AMN Healthcare, 2020a). Likewise, nurses surveyed by AMN Healthcare (2021b) in 2017 reported that at the time of the survey, 48% of nurses stated that nursing shortages had worsened in the last five years compared to 37% in the 2015 survey. These reports were published before the SARS-CoV-2 pandemic, which has further tested hospitals' capabilities and capacity to handle surging patient loads due to patients' needs for hospital care, primarily due to SARS-CoV-2 infections and disease-related illnesses (Baskin & Bartlett, 2021; McCabe et al., 2020; Veerapen & Mckeown, 2021).

Moreover, the pandemic has underlined the gaps and capabilities in healthcare systems (International Council of Nurses, 2020). Recent literature shared that the pandemic has magnified the issue of global nursing shortfalls and exposed healthcare workers to the virus, further stretching the hospital system (Haas et al., 2020). The latest survey by AMN Healthcare (2021b) reported an 83% nursing shortage projection in 2021. Unfortunately, lessons from recent past endemics, such as the 2014-15 West Africa Ebola, pointed out that the long-term investment and sustenance when another major health crisis arose were not

actively acknowledged (Ling et al., 2017; Kruk et al., 2015). A recent article in a local Singapore hospital has since reported the pandemic's toll on the health of healthcare workers in Singapore. About 1,500 were reported as having left the workforce in the first half of 2021 due to the mental and physical toll of the pandemic (Teo, 2021a).

Likewise, one systematic review pointed out the adverse health outcomes pandemics could produce for healthcare workers (Baskin & Bartlett, 2021). It included an inverse relationship between resilience and variables involved in work engagement. Hence, the authors recommended future research to apply interventions to increase resilience to improve healthcare professionals' mental health (Baskin & Bartlett, 2021).

In addition, the SARS-CoV-2 pandemic has forced nurses to work in clinical areas in teams they were not exposed to before, leading to emotional, psychological and physical ramifications (Haas et al., 2020; The National Institute for Health Research, 2020; Veerapen & Mckeown, 2021). Fortunately, throughout the pandemic, nurses and other healthcare professionals have been willing and flexible to be redeployed to aid the growing changes in healthcare needs (International Council of Nurses, 2020; Veerapen & Mckeown, 2021). Furthermore, the latest survey conducted by AMN Health (2021c) shared that nurses' current motivation to retain their roles in the present pandemic world was the organisational culture (44%) and their colleagues (43%). However, the existing shortfall of nurses in the workforce was not solely based on burnout or issues with recruitment strain from the pandemic. Instead, it was an issue previously raised to act upon immediately as gaps in nursing turnover were alarming (Chung & Fitzsimons, 2013). Hence, as SARS-CoV-2-related work challenges and impacts have lowered resilience among healthcare professionals, it was vital for strategies to be tried and tested to improve resilience at an individual and organisational level (Baskin & Bartlett, 2021).

As the nursing workforce ages, concerns over retention have become the central focus of keeping the workforce intact (Chung & Fitzsimons, 2013; Goodare, 2017; Mattioni & Wilson, 2018). Most literature consistently cited that nurses' intention to resign from their nursing roles among NGNs was raised between three and six months of becoming professional (Hung et al., 2018; Tastan et al., 2013). Moreover, the extant literature has shared that the hectic nature of the healthcare industry was well-known for its poor welcoming and nurturing environment for new employees (Stephens et al., 2017). Thus, it has led to new nurses leaving the workforce or seeking other employment as they felt disappointed with their nursing profession choices (Rush et al., 2014; Laschinger et al., 2016). Furthermore, nurses, generally NGNs, often feel stressed (Rush et al., 2014; Laschinger et al., 2016), unwanted, humiliated, incompetent (Wilson, 2012) and burnout (Del Grosso & Boyd, 2019; Goodare, 2017). Wakefield (2018) mentioned that these feelings typically occur when new nurses have reached the resolution stage of their post-registration. They would either become confident and competent or burn out and resort to leaving the profession (Wakefield, 2018).

Likewise, NGNs with one year of clinical nursing experience in Hong Kong were recruited via convenience sampling shared that despite being in the workforce for months, they still felt incompetent, frightened and panicky, which developed the constant thought of leaving (Hung et al., 2018). Furthermore, a descriptive study of 15 RNs in Finland cited other reasons NGNs leave the workforce as generally related to the lack of growth, poor work environment, overwhelming responsibilities and the lack of support and orientation (Flinkman & Salanterä, 2015). Also, it was noted that nurses in the workforce were concerned that patient care might be compromised because of all these issues discussed (AMN Healthcare, 2020b). These findings were consistent with the extant literature regarding

new nurses' intention to leave the workforce due to issues related to compromising patient safety and feelings of professional incompetency (Christopher et al., 2015; Goh et al., 2014).

Nursing Shortfall in OR Globally

Recent studies relating to OR nursing shortfall have also shared similar insights behind the nursing shortfall globally. For example, Beitz (2019) shared that 77.8% ($n = 21$) of interviewed perioperative leaders stated they faced challenges in retaining and recruiting nurses to the OR unit. In addition, the recruitment of OR nurses to replace the retiring workforce was weak due to a lack of exposure to OR units during pre-registration (Beitz, 2019). Thus, nursing management was learning ways to retain the incoming generation of OR nurses (Sherman, 2015). Moreover, other research has shared that difficulties in identifying oneself within an organisation have tainted nurses' impression of the hospital (Goodare, 2017; Leong & Crossman, 2015). Hillman and Foster (2011) also added that retaining nurses became a challenge when new nurses leave the job within one year of joining or, in some cases, just after a week, making it challenging for nursing management to keep the workforce stable.

Similarly, Işık et al. (2020) shared that avoiding establishing communications among OR staff was one reason why OR nurses resigned from their roles. Furthermore, participants in the study shared that despite the professionalism seen in the workplace, dislikes among staffers led to reduced job satisfaction and disconnection at the workplace, which was eventually why the OR units were losing their nurses. Thus, it was vital to acknowledge the importance of partnership in the OR unit to create values to position OR nursing as a viable and competitive career profession (Kapaale, 2018).

Furthermore, Sherman (2015) quoted that the generation of nurses, mainly in the nursing workforce, Millennials and Generation Y, were influential by nature. Researchers have also expressed in the literature that nurses of these generations viewed nursing as just a

job, value work-life balance more and viewed a positive working environment as an essential index to staying in the nursing workforce (Jamieson et al., 2015; Rush et al., 2014).

Additionally, issues in getting their first preferred nursing discipline created a widening gap in nursing shortfall as they were unlikely to fully commit to units they did not select (Christopher et al., 2015). Thus, losing nurses of these generations was more common as their nursing profession values differed from those before them (Jamieson et al., 2015; Kapaale, 2018). Therefore, understanding these individuals' values was beneficial for seeking strategies to retain them in the workforce (Kapaale, 2018). Moreover, as nursing leaders' previous prediction of difficulties in recruiting nurses (67.5%) was reflected in current surveys such as those published by AMN Healthcare, the matter needed prompt acknowledgement.

One study also shared that OR nursing preceptors reported the emotional drain on them to precept new nurses only to see them leave (Beitz, 2019). Chappy et al. (2016) similarly described these challenges in their study. The researchers pointed out that due to the limited or nil previous exposure to OR nursing, preparing the next generation of OR nurses could take up to six to 12 months (Chappy et al., 2016). In the long run, it would affect nursing preceptors' approach towards precepting and the financials of the hospitals (Monahan, 2015), as the growing need to massively recruit and train new nurses in the workforce only for them to leave after became a financial burden (Beitz, 2019). Furthermore, Richards (2016) shared that the cost to replace one nurse who resigned was equivalent to a month or two of one nurse's salary. Thus, nursing management must treat individual nurses as valuable assets (Muthmainnah et al., 2019) and undertake their prime responsibility of retaining nurses in healthcare organisations (Yaqoob, 2018).

Similarly, Lögde et al. (2018) shared that Swedish specialist nurses in the OR from seven different hospitals expressed their decision to leave their roles due to the lack of

compassion and poor reaction from nursing heads, who left them feeling betrayed and disappointed. In some cases, specialist nurses presented their dissatisfaction by resigning as a group (Lögde et al., 2018). Besides, as shared earlier, the generation shift might be evident in the current specialist nursing workforce. These nurses sought a balance between work and personal life and were unwilling to sacrifice the latter (Lögde et al., 2018). The negative criticism surrounding the OR nursing work environment was also themed by Lögde et al. (2018). It was one of the contributing factors for nurses leaving the OR nursing workforce.

As discussed in the earlier sections of the literature review, bullying, if tolerated by nursing management, has caused moral dilemmas and led to nurses' intention to leave their roles (Spruce, 2019). The OR's hierarchical nature further worsened the issue of bullying in the OR as more mistreatment and lack of respect were given to nurses on the lower end of the hierarchy (Freeling et al., 2017; Spruce, 2019). Hung et al. (2018) shared that this phenomenon was not uncommon in nursing culture. What was more concerning was when the bullied became the bully as they struggled to manage those issues (Institute for Safe Medication Practices, 2013). Thus, nursing management needed to address these issues to prevent further deterioration of the OR nursing workforce, which already saw nurses leaving because of the issue (Zhou & Gong, 2015). Moreover, when nurses resigned, especially in CCUs, the quality of patient care declined because of the loss of skilled nurses in those units (Cortese, 2012). Hence, the shortage of nurses, especially in OR units, was vital to be addressed as it impacted the hospital financially and professionally and the ability of its OR unit to open and run smoothly (Beitz, 2019).

Nursing Shortfall in Singapore

The ongoing global nursing shortage has significantly raised concerns in Singapore, when the republic has depended heavily on foreign nurses to fill its nursing shortfalls (Chua, 2020). The fear grew as Singapore's highest nursing immigrants, the Philippines, temporarily

stopped its nurses from working overseas to help its domestic nursing workforce fight the SARS-CoV-2 pandemic (Abu Baker, 2021; Teo, 2021b). Additionally, with the already known recruitment issues with nursing in Singapore, nursing students' poor enrolment rate further burdened the republic's nursing workforce (Chua, 2020). Moreover, the rapid growth in the ageing population and the increasing prevalence of complex long-term diseases have mandated the expansion of the Singapore healthcare sector (Ow Yong & Cameron, 2019; Tan & Lee, 2019). It included building integrated healthcare campuses to deliver patient care according to healthcare needs and to ease transferring care within the same hospital campus (Ow Yong & Cameron, 2019; Tan & Lee, 2019). As discussed earlier, about 1,500 healthcare workers, including nurses, left the workforce entirely in the first half of 2021. Thus, the hospitals might not be ready or have enough time to recover their lost workforce when business returns to usual once the fight against SARS-CoV-2 has been resolved.

Recruitment Strategies to Fill Nursing Workforce in Singapore

As discussed in the previous paragraph, before the pandemic, the Singapore government had been actively responding to the shortfall of nurses by recruiting nurses from neighbouring countries such as China, India, Malaysia, Myanmar and the Philippines (Chua, 2020). It agreed with nursing recruitment strategies internationally (Arnold, 2013; Ohr et al., 2016). WHO (2020a) also shared that it was not uncommon to see high-income countries seeking significant reliance on foreign-born or foreign-trained nurses to support their workforce. WHO (2020a) reported that this phenomenon was 15.2% factual based on its latest findings.

One researcher noted in the literature that hiring foreign nurses has a cheaper return investment in the US because they did not involve domestic joining bonuses or nursing scholarships (Arnold, 2013). However, a local study in Singapore indicated that the strategy to increase foreign nurses' hiring harms training domestic nurses locally as they became less

dependent on training local nurses to hire (Lee et al., 2012). Furthermore, increasing recruitment efforts when nurses leave did not resolve the problem of poor nursing turnover. Instead, nursing management should look into the root causes that have led nurses to resign and mitigate those issues (Cortese, 2012).

In addition, as discussed earlier, with the suspension of nursing immigration for overseas work to Singapore (Abu Baker, 2021; Teo, 2021b) and threats to the supply of nurses globally (Gantz et al., 2012), the Singapore nursing workforce has been currently strained due to issues recruiting nurses both domestically and internationally. Furthermore, Ohr et al. (2016) added that hiring foreign nurses to fill domestic nursing workforce gaps has led to ethical ramifications. It has further drained developing countries with domestic nursing shortages (Ohr et al., 2016). Thus, instead of focusing on immigration recruitment strategies, Liaw et al. (2016) suggested that Singapore's nursing recruitment strategies should be diverted domestically by exposing the nursing profession in the early school years. Lee et al. (2012) also shared that directing training more nurses locally would, in the long term, eradicate nursing shortage issues in Singapore. It concurred with the existing literature stating that recruiting nurses domestically was the strategy for many employers to fill the gap for the poor nursing workforce (Gantz et al., 2012; International Council of Nurses, 2020). However, due to the increased cost of hiring and orientating new nurses, the efforts to retain current new nurses have taken priority (Cortese, 2012; Stephens et al., 2017).

Nursing Retention Strategies

Resilience

As Liew et al. (2016) mentioned, with the growing concern in Singapore and globally regarding the nursing workforce shortfall, nursing recruitment strategies should be focused on domestically. Besides, research has suggested that the abundance of effort to sustain the nursing workforce was to build resilience within the nursing profession (Duncan, 2020;

Goodare, 2017). Moreover, before the recent endemic and current pandemic, the mental health of nurses was already a topic of concern (Tahghighi et al., 2017; Guo et al., 2017). It was related to emotional, physical and psychological burdens that have been heavily discussed in the literature review that nurses have succumbed to. Thus, the WHO (2020b) has recommended that healthcare leaders protect their staff from long-term occupational hazards such as chronic stress and poor psychological health instead of focusing on temporary crises. Furthermore, a recent study exploring resilience among nurses in the SARS-CoV-2 epicentre also recommended that nursing managers promote self-care for frontline nurses and offer them flexible work schedules, shorter working hours and sufficient breaks whenever the opportunities permit (Alameddine et al., 2021).

The literature also pointed out nursing leaders should differentiate between assertiveness and resilience (Duncan, 2020). The literature described resilience as resilient individuals who have survived challenging situations and thrived (McAllister & Lowe, 2012) as an inherited trait (Fletcher & Sarkar, 2013). It was crucial for nurses working in CCUs such as the OR as they were more prone to burnout if resilience was not built (Jackson et al., 2018). For many nurses in critical care areas, the perception of coping with their roles has often tested their resilience (Smith et al., 2015a; Smith et al., 2015b). A systematic review by Baskin and Bartlett (2021) concurred on the positive relationship between burnout and resilience among nurses.

Leong and Crossman (2015) shared that building resilience in NGNs was essential for nursing. It was found to have helped NGNs build the ability to immerse and adapt to different life situations. Similarly, Wong et al. (2018) shared that despite the challenges fresh graduates faced, none of the participants in their study had attempted to leave the profession. Moreover, Wong et al. (2018) suggested that the positive attitude developed towards learning might have led to those nurses' optimism and resilience. The findings agreed with Powell

(2014), who shared that the chronic development of a positive attitude has helped increase resilience. Additionally, existing literature has also suggested a positive relationship between career longevity and the resilience of nurses (Ankers et al., 2018). Thus, nurses succumbed to burnout without resilience in the nursing workforce, inevitably leading them to leave it entirely (Brown, 2021).

Resilience among OR Nurses. Other research has shared similar findings regarding the relationship between OR nurses and resilience. For example, Stephens et al. (2017) shared that enhancing resilience could reduce transition shock and stress among NGNs in the OR unit. Furthermore, as other authors shared in the literature, Stephens et al. (2017) added that resilient individuals in the OR unit thrived through difficulties in the highly stressful and hostile workplace that the OR unit was usually referenced. Recent literature has also agreed with Stephens et al.'s findings, adding that individuals must learn to develop resilience in difficult situations and environments like the recent SARS-CoV-2 pandemic (Duncan, 2020; Veerapen & McKeown, 2021). Additionally, other studies have shared that having a protective clinical environment further reduced burnout and sudden resignations among nurses (Doughty et al., 2018; Flinkman & Salanterä, 2015; Lindfors et al., 2018).

An initial study by Stephens (2013) to explore themes to help foster and develop resilience in student nurses identified five components. These five components were then developed into the '*Stephens Model of Nursing*' (Stephens, 2013). These five components included i) perceived adversity, ii) protective factors (such as individual characteristics), iii) interventions to boost protective factors, iv) cumulative succession, and iv) enhanced adaptive and coping abilities and well-being (Stephens et al., 2017). The model was constituted in Stephens et al.'s (2017) study to promote resilience among new OR nurses using the Registered Nurse Personal Resilience Enhancement Plan design. The elements in the design included i) self-assessment, ii) perioperative factors, iii) personal strategic plans,

and iv) ongoing assessment and evaluation (Stephens et al., 2017). In addition, the design aimed to link NGNs in their boarding process in the OR unit and promote and enhance resilience. In their feasibility scenario, Stephens et al. (2017) discussed coping strategies two new nurses worked on for their strategic plan, such as encouraging each other through text messaging. Such designs were essential and valuable to promote resilience within the OR unit, especially for onboarding nurses, as they acted as a social support system. Stephens et al. (2017) concluded that the design was an imperative product to aid in onboarding new nurses in the OR unit and help to eliminate negativity that might undermine the success of the new graduate transition.

Likewise, Wakefield (2018) shared that creating a supportive environment for NGNs during their initial years of practice was vital. It helped reduce the nursing profession's emotional, physical, and psychological demands. Furthermore, NGNs in the OR were at greater risk due to the highly stressful nature of the OR environment (Freeling et al., 2017). Thus, if not acknowledged, these demands have been reflected in past research as the most significant prosecutors for nurses leaving the workforce (Goodare, 2017).

Macken and Hyrkas (2014) also shared that a deteriorating work environment and poor organisational support were more likely to drive nurses away. Conversely, one study shared that more nurses were moving towards part-time roles instead of resigning from their roles to preserve their psychological well-being (Drury et al., 2014). Thus, Goodare (2017) recommended that healthcare organisations reduce nurses' workload and move towards a more realistic workload, encouraging them to stay longer. Furthermore, research shared that when nurses felt respected, and their health was protected, resilience could be strengthened by increasing trust with their co-workers and leaders (Gensimore et al., 2020). Additionally, it impacted nurses' intention to stay on the job when nursing leaders created a positive work

environment that helped promote nurses' resilience and was seen in the unit (Gensimore et al., 2020).

Bonuses

The literature has also shared that to attract, improve and motivate the nursing workforce, healthcare organisations have used onboarding (Arnold, 2013; Ball et al., 2015), retention and reward bonuses (Kurtzman et al., 2011; Tovmasyan & Minasyan, 2020) to keep its nursing workforce intact. However, having such strategies might not benefit the nursing workforce when nurses do not understand their roles, especially in critical care areas such as the OR unit (Ball et al., 2015).

In contrast, Beitz (2019) argued that bonuses, especially retention bonuses, should be part of an innovative retention strategy for OR nurses. It was because the time to invest in training an OR nurse required a more lengthy and intensive education. Thus, its skills uniqueness should be separated from general nursing, which would rectify differential treatment in remunerations (Beitz, 2019). It was also highlighted by Muthmainnah et al. (2019) that monetary incentives contributed to nursing workforce survival as nurses viewed bonuses as part of their work motivation.

Similarly, one study that explored the impact of rewards on job satisfaction and retention for nurses shared a positive relationship between rewards and nurse retention (Terera & Ngirade, 2014). It meant that the more rewards nurses received, monetary or non-monetary, the more likely they were to stay in the organisation (Terera & Ngirade, 2014). Nevertheless, the study identified no relationship between nurses' job satisfaction and rewards. Hence, it indicated that rewards were not an excellent strategy for retaining nurses if they were unsatisfied with their jobs (Terera & Ngirade, 2014).

Perioperative Nursing Programmes

Much recent literature has also shared the positive outcome of providing specialised nursing transitioning programmes such as perioperative nursing and mentoring programmes. As discussed in earlier sections of the literature review, programmes such as the Periop 101 programme have seen nurses' favourable retention rates in OR units (Byrd et al., 2015; Nash et al., 2018; Tschirch et al., 2017; Wilson, 2012). Byrd et al. (2015) shared that with the implementation of the Periop 101 programme, OR nurse educators could monitor the progress of NGNs in the ORs, allowing them to provide guidance accordingly. Furthermore, implementing the Periop 101 programme saw the nursing retention rate between 2010 and 2013 at 78%. Similarly, other studies have shared that using the Periop 101 programme helped improve the credibility and overall experiences of the nursing students as the structure of the programme bridged OR nursing theories and practices (Nash et al., 2018; Tschirch et al., 2017). Other literature exploring other nursing specialities also shared nurses' positive recruitment and retention rates when transitional programmes were available (Bérubé et al., 2012; Marks-Maran et al., 2013; Whitehead et al., 2016).

Similarly, existing studies shared that mentoring programmes in the OR have helped NGNs adapt to the foreign environment of the OR nature compared to previously exposed nursing units during student nursing placements (Freeling et al., 2017; Pupkiewicz et al., 2015). Furthermore, nurses new to OR nursing have also shared that having a mentor to guide them during their first few runs in surgical assisting helped them psychologically as it helped reduce their stress levels (Pupkiewicz et al., 2015). Also, a single-blind study on Iranian OR nursing students affirmed in their findings that mentorship could improve the clinical competence level of OR student nurses in five different aspects (Mirbagher Ajorpaz et al., 2016). It included foundational skills and knowledge, collegiality, proficiency, professional development and overall perceived competence. It was especially apparent in new nurses in

the control group (Mirbagher Ajorpaz et al., 2016). It concurred with Crafoord et al. (2018) survey study sharing the positive impact mentoring has on student nursing clinical learning environment.

Similarly, Sherman (2015) shared that mentorship gave purpose to the current generation, leading the nursing workforce (Generation Y) to lead the older generation with new technologies due to their love for technology. Gillespie et al. (2013) similarly stated that the availability of hospital-based mentorship programmes was crucial to cater to new staff as it successfully developed the next generation of OR nurses' professional development.

Conclusion

In conclusion, the final section of this literature review has discussed retention issues within nursing and OR nursing in a global and Singapore context. The section has also covered nursing shortfalls issues globally and in Singapore, as well as strategies healthcare organisations have implemented to minimise the problem. Based on the review of the literature, policies relating to staff education, recruitment, ratio and skills retention needed change. These issues have been magnified due to the pandemic of healthcare workforce shortages. Thus, urgently rectifying these issues would allow healthcare industries to restore their workforce with a skilled workforce in time to cope with the post-pandemic healthcare woes.

Summary

In summary, chapter 2 has presented a discussion of identified dated research, highlighting the gaps in the literature pertaining specifically to the challenges OR NJNs Singapore faced with their current IPs that have impacted them in their professional career. However, due to the challenges OR NJNs in Singapore faced as a result of their recent IPs received identified by the literature being limited, the search was expanded to international literature. Thus, the challenges were identified based on the vast availability of international

nursing research related to OR nurses' challenges, their impacts on their practices, and other nursing speciality studies to understand the closely linked phenomena. These included theory-practice gaps, poor support systems, and insufficient OR IP length. The noted outcomes of these challenges have led novice nurses working in areas like the OR unit to suffer early burnout and face challenges in transitioning to practice. In addition, the OR unit has faced issues relating to nurses' confidence and competency levels, resulting in OR nursing practice incompetence and increased work-related stress. The literature shared that the root cause of these outcomes began with the transition to practice gaps in NJNs and NGNs in OR experience (Foran, 2015; Elley, 2016; Sherman, 2015; Vortman & McPherson, 2021). Its initial jolt of transition to practice gaps arose due to a lack of opportunities and exposure to practice OR nursing during their clinical placements as student nurses (Foran, 2015; Elley, 2016; Inne & Calleja, 2017; Vortman & McPherson, 2021). Furthermore, one study shared that being shielded from the full breadth of an RN's roles and responsibilities added to the jolt (Woo & Newman, 2020).

Furthermore, the gaps in theory to practice have led NJNs and NGNs into culture shocks as they were overloaded with responsibilities and information that they were not previously exposed to during their training (Al Awaisi et al., 2015; Ke & Stocker, 2019; Odland et al., 2014; Woo & Newman, 2020). It has also led to NGNs and NJNs feeling a vast disconnect between nursing school and professional practice (Ortiz, 2016). Even with proper exposure to OR nursing practices, advancing technologies in healthcare industries (Smith & Palesy, 2018), poor staffing (Odland et al., 2014), inadequate skills mix, and lack of experience in different clinical scenarios (Hussein et al., 2017), made adapting to OR nursing challenging. Thus, these issues led to self-confidence in their delivery of nursing practice (Sweeny, 2010).

The technical nature of OR nursing practice also contributed to the challenges when

nurses were new to the OR unit. With no prior knowledge of the setting and the disconnect the unit was from other nursing units, nurses generally had to unlearn previous practices taught in nursing schools or other units to gain the foundation necessary for a professional OR nurse (Martin, 2011). It could be challenging for OR nursing bodies as new and novice nurses could resist learning (Sweeny, 2010). The handing of the baton between the generations of nurses has led to further issues on how learning was delivered and skill acquisition was achieved. With newer generations of nurses entering the workforce, the focus has shifted towards having a work-life balance rather than pride in the profession (Jamieson et al., 2015).

Furthermore, the need for a positive working environment (Jamieson et al., 2015; Rush et al., 2014) and social connection with peers (Jamieson et al., 2015) made nursing more of a place for social connection than work. It was a vast comparison to the older nurses who joined nursing for unselfish and idealistic reasons (Logan, 2012). Thus, the turnover rate of the newer generation of nurses after 12 months of being in the profession was higher due to the lack of capacity to handle work-related stressors (Jamieson et al., 2015).

Besides, the introduction of technologies such as RAS to improve surgical procedures and outcomes of patients undergoing surgery has hindered the development of learning for newer and skilled OR nurses (Smith & Palesy, 2018). Furthermore, with the introduction of RAS, perioperative patient care has seen some alterations (Luck & Gillespie, 2017). Hence, it has made it difficult for OR nurses to acquire new skills in OR technology as they might not necessarily have a resource person to champion learning new technologies.

Other studies have also outlined external technologies that have intervened with professional work not isolated to nursing. For example, the unnecessary use of handphones for personal usage, such as surfing social media platforms on duty, has caused task distractions (Sergeeva et al., 2016). It might have caused various episodes of lapse in

concertation, inevitably leading to adverse patient outcomes (Feuerbacher et al., 2012).

Hence, it also made learning difficult as nurses constantly sought to verify what was learnt.

These issues ultimately led to NGNs and NJNs leaving the workforce one year after becoming professionals in the OR unit. What was more concerning was that those nurses left the profession altogether due to the tainted image that they had experienced. The issues were not isolated intrinsically. The extrinsic issues of working in the OR unit have also contributed to the matter. These included the hierarchal nature of the OR unit, WPB by senior OR unit members, and lack of exposure to OR nursing during student nursing. The OR's hierarchical nature that WPB further worsens was not uncommon in nursing culture (Hung et al., 2018; Lögde et al., 2018; Yang & Zhou, 2020). This mistreatment and lack of respect given to nurses on the lower end of the hierarchy led them to high-related work stress, which unavoidably led to their departure from the profession (Freeling et al., 2017; Spruce, 2019). Although some studies have shared that WPB has helped NGNs and NJNs build resilience and strength in their professional abilities (Hung et al., 2018; Leong & Crossman, 2015; Wong et al., 2018). Besides, the literature shared that WPB was generally accepted as a normal nursing workplace phenomenon. However, it was often misplaced and misdiagnosed by senior nurses and management (Etienne, 2014; Hartin et al., 2020; Ovayolu et al., 2014). Thus, it has made NGNs feel isolated and unheard in those bullying episodes (Ke & Stocker, 2019; Tuckett et al., 2015).

Furthermore, the plague of WPB has led to the poor mental health of the bullied nurse (Beitz, 2019; Freeling et al., 2017; Smith et al., 2015a). Thus, one study has recommended acknowledging WPB during IPs so NGNs and NJNs know its existence and how to approach it (Işık et al., 2020). Furthermore, another study stated that WPB was the accountability of healthcare leaders when reported and recommended expanding the frequency and scope of training for WPB intervention so nursing leaders could intervene appropriately (Keller et al.,

2019).

The literature has also outlined social isolation from senior OR nursing members to hinder NGNs and NJNs during their IPs or, in some literature, described as TSPs (Crafoord et al., 2018). The isolation incidences included role dominance during surgery, making nurses uncomfortable in those discussions, thus excluding themselves (Eskola et al., 2016). Furthermore, ill-treatment from surgeons has led to nurses feeling worthless and highly critical of themselves, diminishing their self-confidence (Freeling et al., 2017; Higgins & Macintosh, 2010). One study also shared that some experienced OR nurses were not prepared to guide novice nurses as they felt that their social position would be challenged in the future (Pupkiewicz et al., 2015).

Lastly, the literature outlined the biggest challenge present in the nursing profession, burnout, which challenges nurses as soon as they enter the profession and impacts their professional journey. Conceivably, during TSPs, learning opportunities and social support issues were present because many nurses were burnout. Moreover, NGNs felt they were heavily faced with burnout because the nursing profession was susceptible to rotating shifts, which many younger nurses felt impacted their work-life balance (Jamieson et al., 2013). Additionally, the increasing job demands in the healthcare industry, poor staffing, and declining job satisfaction have led many hospitals to report a high turnover rate of nurses after only 12 months of being on the job (Jamieson et al., 2013). These issues mounted for nurses who stay in service long. One study shared that senior nurses similarly faced burnout issues in present-day nursing practice due to the higher work demands and responsibilities (Foley et al., 2021). However, because burnout has been extensively researched, nursing scholars did not consider it an emerging phenomenon; instead, it was viewed as an occupational hazard in the healthcare industry (Del Grosso & Boyd, 2019). Thus, a body of literature recommended having a protective clinical environment to reduce burnout among

nurses (Doughty et al., 2018; Flinkman & Salanterä, 2015; Lindfors et al., 2018). In line with the SARS-CoV-2 pandemic, recent literature has recommended that nursing managers promote self-care for frontline nurses and offer flexible work schedules by shortening working hours and ensuring sufficient breaks whenever the privilege arises (Alameddine et al., 2021). Overall, the matter has led to a shortage of nurses today. Furthermore, for nurses who have stayed in the profession, retaining them has become a challenge due to these continued issues.

The literature has shared that nurses still left the profession even with fiscal motivation and rewards. A local study in Singapore pointed out that healthcare organisations should be wary of fiscal motivation and reward methods. It was because such tactics would not alleviate the nursing profession but further widen the issues of continuing poor staff turnover, support, and education provided to OR nurses (Leong & Crossman, 2015). Moreover, fiscal motivation and rewards could prove costly for healthcare organisations to sustain (Warren & Mills, 2009). Thus, one study recommended that healthcare industries encourage nurses to be self-motivated and innovative in upgrading their skills and knowledge based on the latest evidence-based theories and practices (Støren & Hassen, 2011). Besides, it would benefit nurses as they could better understand today's patients' progressive health issues and demographics, which would help them achieve a sense of self-achievement and ensure their job security (Støren & Hassen, 2011).

Conversely, factors contributing to the success of current IPs included sound support systems provided by nursing preceptors and mentors and collaboration between nursing schools and hospitals to deliver a joint OR nursing introductory programme to better the transition of novice OR nurses. The outcomes of these strategies have helped novice OR nurses stay longer in the profession and created the eagerness to find more knowledge and gain more skills relating to OR nursing practices.

One study shared that TSPs were ideal for NGNs and NJNs in nursing units because they acted as a learning transfer platform between experienced and novice nurses (Green, 2016). Furthermore, it helped build a substantial foundation of OR nursing practice not previously exposed in student nursing (Monforto et al., 2020). The literature also reflected nurses' agreement that having structured OPs correlated to a positive experience with adaptation, work satisfaction, and a support system (Strauss et al., 2016). Additionally, OPs that have been redesigned to eliminate training information redundancies in CCUs have received a positive reception from the nursing profession (Monforto et al., 2020). Likewise, programmes such as TSPs provide many aspects of educational opportunities. These vary from classroom/theory, written materials, in-services and website materials and the availability of hands-on nursing skills (Rush et al., 2013). In other nursing professions, nurses also shared that even a short two-week introductory programme has allowed them to appreciate the philosophy of community care nursing and the different approaches to patient care (Foley et al., 2021).

The literature also shared that TSPs benefited OQNs transitioning to a new country of practice. OQNs found such programmes beneficial for understanding cultural diversity and slight differences in nursing practices (Ohr et al., 2016; Zanjani et al., 2018). Thus, a body of literature shared that programmes such as TSPs, hospital-wide OPs and unit-specific IPs should not be overlooked as they could provide powerful learning experiences for nurses (Beitz, 2019; Innes & Calleja, 2018). The availability of support systems for NGNs and NJNs during TSPs has also been shown to have alleviated the stress levels of nurses undergoing the transition to practice (Marks-Maran et al., 2013; Teoh et al., 2013). Furthermore, the availability of support personnel, such as nursing preceptors, during their practice hours has helped reduce nurses' anxiety (Marks-Maran et al., 2013).

Nursing IPs have also proven to be an excellent strategy to retain nurses. It also aided healthcare organisations in reducing human resource efforts to recruit nurses and costs (Hillman & Foster, 2011; Odland et al., 2014). One study shared that TSPs showed a higher possibility of nurses returning to the ward and organisation (Tuckett et al., 2017). The length of these programmes also played a significant role in nurses learning abilities and capabilities (Graf et al., 2020; Leong & Crossman, 2015; Strauss et al., 2016). In speciality care units like the OR, nurses were required to function in multiple clinical roles, such as scrub and circulating nurse (Martin, 2011). Furthermore, acquiring skills and knowledge to act as an OR nurse could take up to five to six times longer than the timeframe to achieve in a commonly exposed nursing unit (Ball et al., 2015). Thus, the timeframe of IPs was viewed as a vital role in a successful transition to professional practice (Woo & Newman, 2020).

Recent literature sharing healthcare workers' diminishing motivation levels due to the current SARS-CoV-2 pandemic was concerning. Also, as their mental health was affected by pandemic fatigue, it reduced functionality at work (Tovmasyan & Minasyan, 2020). Despite the motivational push among current nurses in this health crisis, which included the public's support and solidarity for their efforts during these challenging times (Veerapen & Mckeown, 2021), the uncertainty of the healthcare direction has exhausted many in the profession. A recent local post in Singapore has shared that the country has lost about 1,500 healthcare workers in the first half of 2021 due to the mental and physical toll of the pandemic (Teo, 2021a). Thus, sorting the availability of skilled nurses in the workforce was detrimental to the survival of the healthcare industry. Furthermore, newer OR nurses would suffer from the constant redeployment to non-OR units due to the SARS-CoV-2 pandemic (Miljeteig et al., 2021; Prakash et al., 2020). It was because such clinical rotations did not benefit them as there was no consistency in learning to be competent in OR nursing (Innes & Calleja, 2018).

Therefore, the study topic had to be explored because further research was required to understand the challenges OR nurses in Singapore would face in the new phase of post-pandemic nursing practice. Even before the recent health crisis, the issue had many gaps that previous literature had recommended exploring. For example, one study shared that IPs were vital to developing nurses professionally, as transitioning to professional practice would limit their ability to hone themselves further academically due to overwhelming commitments to work (Pertiwi & Hariyati, 2019). Therefore, it was essential to hear the challenges of this generation practising OR nursing in a challenging time for the health industry. The gaps and issues raised in the literature review have supported the study's aims and purpose of the study. Besides, the information acquired during the study could be used to recommend future practices that safeguard the professional image and job security among OR nurses. The next chapter of this dissertation will move into research method discussion and data collection.

CHAPTER 3: RESEARCH METHOD

This chapter will present and describe the chosen research methods and data collection that investigated the impacts of nursing IPs on NJNs in Singapore OR units. It would begin with an introductory summary of the study thus far, followed by a restatement of the research problem and purpose. In the previous chapters, the author has outlined the quintessential problem from the literature that embarked on the exploration to pursue the research topic and found meaning behind the phenomenon. Chapter 1 outlined the problem statement to support the study's purpose, aims, and objectives. The nature and significance of the study were also briefly discussed to sustain the need for the study. Lastly, the research questions and hypotheses were presented.

In Chapter 2, the summary of gaps was highlighted in the literature pertaining specifically to the challenges OR nurses and their other nursing counterparts faced that impacted them in their professional career development and sustainability. Due to the limited literature available within the Singapore OR nursing context of the phenomenon, the literature reviewed was expanded to current impacts identified based on the vast availability of international and other nursing speciality studies. The findings from the literature examined reflected challenges that later impacted nurses with their job roles, included theory-practice gaps (Cheng et al., 2014; Hung et al., 2018; Ortiz, 2016), poor support systems (Beitz, 2019; Freeling et al., 2017; Smith et al., 2015a) and insufficient length of OR IPs (Baldwin, 2016; Kowalski & Cross, 2010; Chappy et al., 2016; Maxwell, 2011; Rush et al., 2013; Vortman & McPherson, 2021). The extant literature noted that the outcomes of these challenges had led novice nurses working in areas like the OR unit to suffer issues such as the impacts of early burnout (Chard, 2010; Del Grosso & Boyd, 2019; Vander Elst et al., 2016) and transition to practice challenges (Foran, 2015; Elley, 2016; Vortman & McPherson, 2021). In addition, the OR unit itself has faced issues relating to nurses' confidence (Crafoord

et al., 2018; Stephens et al., 2017; Wilson, 2012) and competency levels (Blomberg et al., 2019; Gillespie et al., 2018; Wang et al., 2016) that have resulted in OR nursing practice incompetence and increased work-related stress. The findings from the literature reviewed also pointed out that the root cause of these outcomes began with the transition to practice gaps NJNs and NGNs in OR experience that arose from a lack of opportunities and exposure to practice OR nursing during their clinical placements as student nurses.

As discussed in Chapter 1, the problem in the research topic arose from the OR units trying to compress the knowledge and skills of perioperative nursing into NJNs OR IPs within a few weeks. As informed by existing literature, this was not feasible as such knowledge and skills require months and years of training to be attained and proficient. Moreover, theoretical nursing could not help nurses resolve complicated clinical issues when they appear, as each situation presents unique challenges. Thus, nurses' actions were compounded by what was best known through previous and current knowledge and corrected based on hospitals' policies that might traumatise new professional nurses and result in patient harm and unintended industrial-related stress. Besides, the progression from student nurse to professional nurse has caused many NGNs to develop stress in their new role due to the change in their role status (Chang & Hancock, 2003). It has forced OR nurses to self-motivate themselves to learn on the job to function competently in their daily work routines. It has, in turn, made nurses feel stressed, especially when assisting in major surgeries (Smith et al., 2015).

Despite many variations to provide OR nurses with continuing education and life-long learning programmes (Noonan, 2011), OR nurses still faced challenges in their job roles that affected patients and other healthcare workers. Thus, it was essential to instil the correct knowledge and concept of perioperative nursing in nurses' induction to the OR units, more so as elective surgery services were temporarily reduced or blocked during health crises like the

recent SARS-CoV-2 pandemic. With the absence of perioperative nursing experiences during student nursing already an issue, it has decreased interest for nurses to pursue perioperative nursing as a speciality after graduation (Gregory et al., 2014). Moreover, health pandemics like SARS-CoV-2 have widened the gaps of missing OR nursing learning opportunities and exposure.

Also, as such health crises did not decelerate the progression of healthcare technologies and practices, OR nurses still needed to constantly adapt and develop themselves professionally (Duff et al., 2014). Thus, it was imperative and opportunistic for nursing management to explore how to effectively support existing and future nurses in their role transition and daily work responsibilities in the OR unit when elective surgical services fully resume in pre-pandemic mode. With the lack of empirical research regarding the phenomenon, particularly in Singapore, and in the face of global nursing shortages, it was imminent for the matter to be explored and understood for the well-being of patients and the nursing profession.

This study aimed to explore the impacts of nursing IPs on NJNs in Singapore OR units to prepare nurses better to provide competent OR nursing care. The study's results were aimed at helping nursing educators, management, and policymakers generate solutions to improve existing IPs in Singapore OR units and improve those gaps. Besides, recognising the professional impacts of nursing IPs delivered on OR unit NJNs in Singapore would help the nursing profession close gaps in issues contributing to the ongoing poor staff retention rate in their OR units. Also, with sufficient exploration of the phenomenon, the study provided the capacity to compare the results with previous international findings to establish similarities, differences, and new perspectives. Besides, an explanation from this study exploration could help add meaning to the phenomenon.

As informed in the previous paragraph, the study aimed to address the impacts of nursing IPs on NJNs in Singapore OR units to prepare them to provide competent OR nursing care. The explanatory sequential mixed-methods design was adopted to examine and explain the study's phenomenon. The design would first begin with gathering quantitative data, followed by interpreting the quantitative results with in-depth qualitative data (Guetterman et al., 2015). It involved using a quantitative survey to collect data from Singaporean OR NJNs from a Singapore public hospital group guided by Warren and Mills's '*Conceptual Model of Nursing Motivation*' and Benner's '*From Novice to Expert*' theory to explore whether the impacts OR nursing IPs were related to professional development challenges faced by Singapore OR NJNs. In the exploratory follow-up, the researcher investigated the phenomenon in depth using the survey study results to explain the impacts OR nursing IPs had on Singapore NJNs in the OR units at Singapore hospitals.

Furthermore, the study aimed to lend insights into the effectiveness of existing OR IPs delivered to NJNs in Singapore OR units. The implications of the study's objectives were essential to the OR nursing discipline in Singapore because it helped explore and explain why many nurses were leaving the OR nursing workforce.

In summary, the study aimed to help OR nursing units in Singapore to sustain and retain nurses longer by reducing clinical stress and having more guided learning in specialised nursing fields by exploring the challenges, impacts and effectiveness of having structured programmes at the beginning of a nurse's journey to better prepare them in their new full-time employment and roles; thus, preventing stress from accumulating. The study would also help bridge the issues identified in previous studies and recent issues faced by OR nurses.

The following section of this chapter will discuss the research approach and design adopted in the study. It would include a symposium on the research approach and design and

the rationale for using the chosen research methodology. It would be followed with a discussion of the population and sample of the research study that would describe the characteristics of the population, their demographics, estimated sample size and the inclusion and exclusion criteria. Next, the description of the study's materials and instruments research tools will be discussed, including their origin, reliability, and validity, as well as the operational definition of variables for the study. It will be followed by a discussion of the study procedures and ethical assurance to outline the approval procedure for the study and the specific ethical issues and considerations undertaken, and the discussion of the data collection and analysis undertaken for the study will be outlined. Finally, a chapter summary will be discussed before moving into Chapters 4 and 5 of the study.

Research Approach and Design

Mixed-Methods Research

Mixed-methods research has gained recent attention and has grown in social science over the past three decades (Almedia, 2018). Its research methodology was first embarked on between 1985 and 1990 by various writers from Great Britain and the US (Creswell & Hirose, 2019). The writers came from different professional fields of research, such as education, management, medicine and sociology (Creswell & Plano Clark, 2018). The mixed-methods research methods discussed varied, and the choice of mixed-methods research approach depends on the research problem and purpose (Creswell, 2014; Pluye & Hong, 2014). Authors of mixed-methods research have described the research methodology as a hybrid integration of quantitative and qualitative research methods (Creswell & Plano Clark, 2018). Furthermore, authors of mixed-methods have suggested that the approach taps upon the philosophical approach of pragmatism (Creswell, 2014; Morgan, 2014). The NIH Office of Behavioral and Social Sciences shared that “the oversimplified definition of

pragmatism philosophical is that humans use scientific knowledge to explain the changing natural and human conditions'' (2018, p7.).

Various mixed-methods research approaches have been shared in the literature and textbooks. Creswell (2014) discussed three basic approaches: convergent, explanatory sequential, and exploratory sequential. Other advanced approaches were cited in Creswell (2014), including the embedded, transformative and multiphase approaches. Likewise, other authors also noted these approaches as common mixed-methods research approaches (Almedia, 2018; Creswell & Plano Clark, 2018). For comparison in the later section of the chapter, the author will compare and contrast the three basic approaches, as limited studies have adopted the advanced approaches to provide a comparison and argument (Hayes et al., 2013). Despite the different approaches, each design has been unique to the need of a study and shares some commonalities. For example, each design used two or more research methods to collect and analyse data (Almedia, 2018; Creswell, 2014). The main difference between each design was the approach of the design. For example, a convergent approach would involve the simultaneous collection of quantitative and qualitative data and later examination in contrast or relating the findings to formulate an interpretation (Almedia, 2018; Creswell, 2014; Creswell & Plano Clark, 2018). Mixed-methods authors suggested that its third research methodological movement was an imperative introduction to the research paradigm as it no longer restricted researchers from following the traditional concept of approaching a phenomenon with a sole research method (Creswell & Planko Clark, 2018). Thus, the mixed-methods design has allowed researchers in recent decades to blend different approaches and permits them to design research questions within the parameters and context of the phenomenon (Almedia, 2018; Creswell, 2014; Morgan, 2014; Pluye & Hong, 2014; Shorten & Smith, 2017).

The mixed-methods design has, therefore, been a method to attain both the insights of a phenomenon based on statistical trends through quantitative data and the interpretation and meanings of the experience of participants based on their real-life experiences (Almedia, 2018; Creswell, 2014; Newby, 2014; Pluye & Hong, 2014; Shorten & Smith, 2017). Given the broad availability of choices of mixed-methods research methodologies, as reflected in the introductory section of the section, the author concluded to adopt the explanatory sequential mixed-methods design for the study as it was viewed as the most suited method to explore and explain the impacts of nursing IPs on NJNs in Singapore OR units encountered. The motivation for the choice was based predominantly on the research field, as there were limited studies about the phenomenon relating to the impacts current OR nursing IPs received had on OR NJNs in Singapore OR units. It was also chosen to meticulously comprehend and recount the trends of impacts recent OR nursing IPs received have on OR NJNs in Singapore OR units and the individual perspectives of these nurses based on their experiences. This chosen research design and methodology allowed the author to analyse those accounts statistically and descriptively (Almedia, 2018; Bowen et al., 2017; Creswell, 2014). Finally, with the limited literature available regarding the phenomenon, especially within the Singapore OR nursing context, the author felt that it was substantial to choose the explanatory sequential mixed methods design as it would allow the author first to explore the trends of the issues and guided an existing theory and later explain the findings with the qualitative data. Besides, with the author's strong understanding of the quantitative background, the mixed-methods design further affirmed the argument (Creswell, 2014).

Explanatory Sequential Mixed-Methods Design

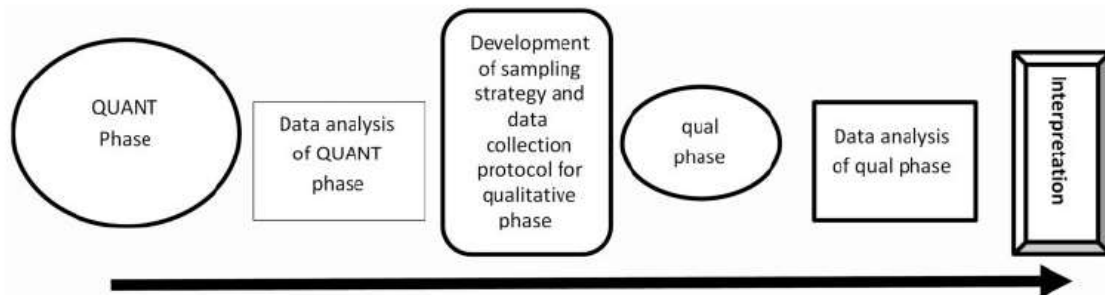
The explanatory sequential mixed-methods research design (Figure 3) involved a two-phased research approach (Almedia, 2018; Creswell, 2014). Firstly, it involved collecting and analysing quantitative data, followed by collecting qualitative data to explain

the quantitative data (Almedia, 2018; Creswell, 2014; Schoonenboom & Burje Johnson, 2017; Shorten & Smith, 2017). The explanatory sequential mixed-methods research design aimed to follow up on quantitative data (Doyle et al., 2016). The notation for mixed-methods design was cited in the books and literature as QUAN → qual or QUAN → QUAL or quan → QUAL (Creswell 2014; Morse & Niehaus, 2009). The notation presented the meaning of the presentation of a study. For example, QUAN → qual (QUAN being quantitative and qual being qualitative) was described as a study that was mainly dominated by the quantitative method and the qualitative method complementing (Doyle et al., 2016; Hayes et al., 2013; Palinkis et al., 2019; Schoonenboom & Burje Johnson, 2017). It represented the connections between methods (Creswell, 2014). (Creswell, 2014). Thus, as the study was relatively raw within the Singapore OR nursing context, the author's choice to deduce the adoption of the explanatory sequential mixed-methods approach was supported as the method uses the QUAN → qual approach (Creswell, 2014). It could be supported by the extant literature and textbooks suggesting the research design's suitability with previous similar studies (Hayes et al., 2013; Palinkis et al., 2019; Schoonenboom & Burje Johnson, 2017). For example, an Australian study researching the intra-professional collaboration amongst nursing leadership teams at a Sydney tertiary hospital adopted the explanatory sequential mixed-methods research design. It discussed its helpfulness in guiding the authors to explore their research topic better (Lamont et al., 2014). In their discussion summary, the authors noted that whilst previous studies have widely examined the benefits of collaboration within the healthcare industries, the mixed-methods research design that was adopted in their study has allowed them to address the gaps in empirical research regarding how collaboration was demonstrated and fulfilled in practice. It was achieved with the explanatory sequential mixed-methods design, which concurred with the aim of the authors' study first to explore the phenomenon,

then describe the data gathered to give an in-depth meaning of the findings (Creswell, 2014; Creswell & Plano Clark, 2018).

Figure 3

Explanatory Sequential Mixed-Methods Design



Note. This model was referenced in Doyle et al. in 2016, summarising the process of undertaking the explanatory sequential mixed-methods design. From ‘An Overview of Mixed Methods Research – Revisited,’ L. Doyle, A. Brady, and G. Byrne, 2016, *Journal of Research in Nursing*, 21(8), p.627.

Another nursing study focusing on nephrology nursing has also found the benefits of using the explanatory sequential mixed-methods research design. It arose as the authors acknowledged the limited available studies investigating the reason behind the choice of dialysis modality for pre-dialysis and dialysis patients and their caregivers (Morton et al., 2011). The authors shared that the mixed-methods design adopted in their study allowed them to quantitatively identify what characteristics pre-dialysis patients, dialysis patients, and caregivers ranked most vital for dialysis options. The authors later identified 28 characteristics identified by patients and caregivers, and descriptions of each characteristic received a quotation to explain the meaning behind individually ranked characteristics. With the integration of data that followed the explanatory sequential mixed-methods research design, the authors were able to present the answers to their research questions by bringing in human perspectives and individually ranked characteristics (Morton et al., 2011).

Similarly, a Canadian study adopted the explanatory sequential mixed-methods research to explore elements that influenced the implementation of mentorship programmes in nursing academia design (Nowell et al., 2017). The study's overarching aim to identify the state of mentorship in Canadian academia and examine the facilitators and barriers to implementing mentorship programmes was successfully achieved by adopting the explanatory sequential mixed-methods research design. The authors stated that this was achieved because the design allowed more extensive quantitative data to represent the larger targeted population group while providing detailed insights for their qualitative study (Nowell et al., 2017). The authors' views were similarly sustained by authors with mixed-methods in the literature (Creswell, 2014; Tashakkori & Teddlie, 2010).

Lastly, a local study in Singapore to determine work-related challenges faced by older nurses adopted the explanatory sequential mixed-methods research design (Ang et al., 2017). The adopted mixed-methods design allowed the authors to identify the top three challenges associated with the phenomenon in the quantitative phase of the study. Subsequently, the three variables emerged with five themes to support the authors' study aims and allow comparison with similar previous studies. Therefore, in relation to previous studies' adoption of the explanatory sequential mixed-methods research design, the author sustained that this design was appropriate to achieve the overarching goals of this study. Furthermore, the sequential design of the mixed-methods design further bolstered the appropriateness of its usage for this study, as supported by the extant literature that has presented the usage of the designs in previous studies.

Although other designs discussed in the previous section were available, the author determined that those designs were not appropriate to help achieve the overarching goals of this study based on a few factors regarding each design's strengths and weaknesses. For example, with the exploratory sequential design, the dominant qualitative phase would lead

into the quantitative phase (Creswell, 2014; Doyle et al., 2016; Hayes et al., 2013; Palinkis et al., 2019; Schoonenboom & Burje Johnson, 2017). As informed from its description, the strength of the design was for researchers to use the qualitative data analysed to build a quantitative instrument if it was not present (Creswell, 2014; Creswell & Plano Clark, 2018). However, the researcher must administer the developed instrument to test its validity. Creswell (2014) cautioned that it might lead to inadequate measurements in the instrument for a researcher desirably to measure a concept. Almedia (2018) stated that the identified variable-population irrelevance resulted from the small sample size to represent a larger population. Thus, it rendered researchers to administer a third phase into the exploratory design to achieve the desired results. Due to the limitation of the academic requirement regarding the timeframe for the completion of this study, it was not feasible to add more phases to achieve the desired study outcome in time.

Furthermore, the six-week timeframe allocated for data collection by the University would not be sufficient for the qualitative data analysis to be completed to build on the quantitative instrument for the quantitative research. However, Creswell (2014) argued that both sequential methods were strategically outlined to allow a single researcher to divide their investigation into two manageable tasks. However, the author's previous argument rescinds Creswell's suggestion. Furthermore, the instruments and theory were already outlined for the study, thus sustaining the appropriateness of using the former design over the latter.

Likewise, the appropriateness of using the convergent parallel mixed-methods design was not in line with the overarching goals. Firstly, data from both phases of the mixed methods design would need to be collected concurrently, meaning more time was required to manage data (Almedia, 2018) as both phases would be given equal priority concurrently (Doyle et al., 2016). Furthermore, the findings of both data stand separate as the findings of

individual phases were not dependable on the outcomes of the other (Creswell & Plano Clark, 2018). Besides, Doyle et al. (2016) stated that one of the main challenges was when each phase's data diverged instead of converging. It was because new insights and theories might emerge when data divergence occurred, which expelled the purpose of using the convergent parallel mixed-methods design (Creswell et al., 2008). It would require the author to reanalyse the data sets to rectify the divergence stage (Schoonenboom & Burje Johnson, 2017). Thus further prolonging the timeframe to complete the study.

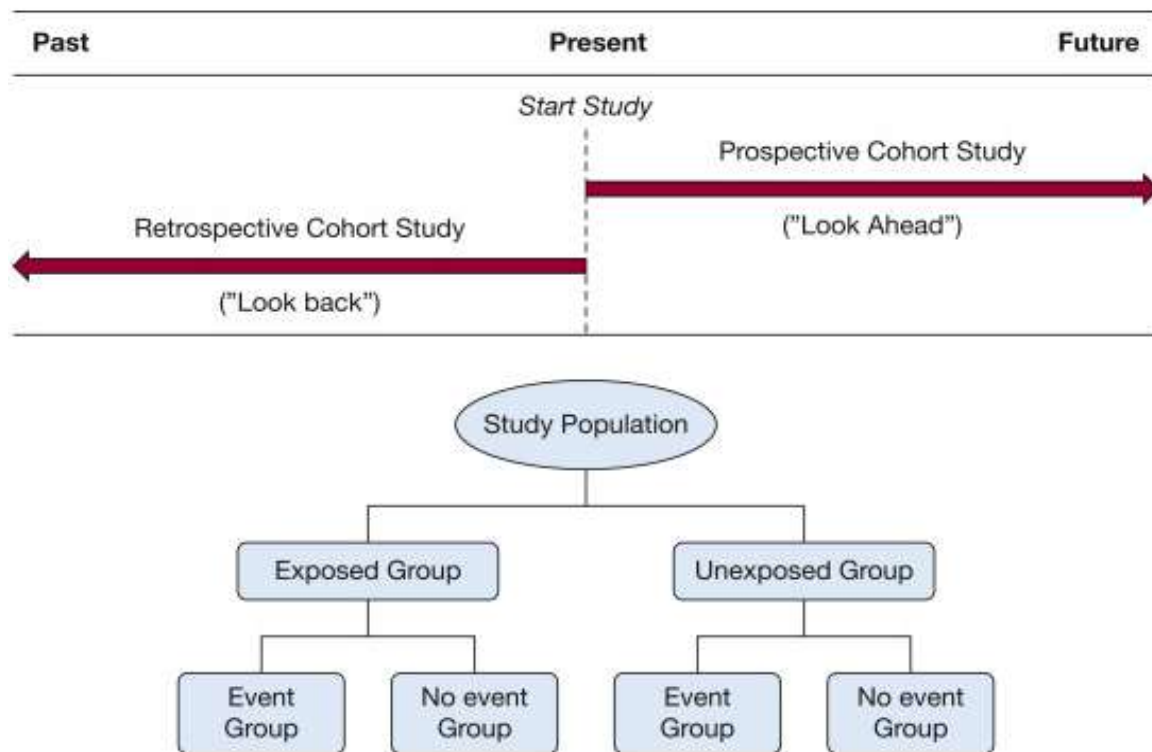
Furthermore, the design was a model to present both results concurrently, which required having relevant solid expertise in both research methods, which was ideal and vital to a study's validity (Almedia, 2018). Thus, as the model of the convergent parallel mixed-methods design was to compare and contrast findings from two separate data, it sustained the argument that the design was not appropriate to achieve the overarching goal of this study as the aim was to follow up on a quantitative data with a qualitative phase later interpret the findings. The following section will discuss the steps for the explanatory sequential mixed-methods research design in more detail.

Design Steps – Explanatory Sequential Mixed-Methods Design

As discussed in the previous section, the explanatory sequential mixed-methods design steps have been oversimplified. Firstly, it involved performing quantitative data collection, analysing the collected data, and using it to guide the qualitative phase of the study (Creswell, 2014; Doyle et al., 2016). However, this was only an overview of the description of the design. Thus, this section aims to elaborate on the research design for the quantitative and qualitative phases of the study, with the explanatory sequential mixed-methods design as the primary research design. As suggested in the research topic title, the author adopted the mixed-methods study design involving a cohort study and a phenomenology study.

Phase 1 – Quantitative cohort study. The literature described the cohort study design (Figure 4) as retrospective or prospective and a type of observational study exploring two or more groups over a particular time (Sedgwick, 2014; Wang & Kattan, 2020). In a retrospective cohort study, the researcher would look back to gather data that had already occurred, while in a prospective cohort study, the researcher would look ahead to collect data on outcomes that had yet to happen (Wang & Kattan, 2020). This study incorporated both aspects of the cohort study design as the matter to be explored had already been exposed to the population of interest. However, the future outcomes were limited. Thus, probing the matter would provide more insights. Besides, Sedgwick (2014) pointed out that the advantage of both cohort study designs was that they allowed researchers to record exposure to an outcome before it occurred. For example, a group of researchers used a retrospective cohort study to outline the epidemiology of multimorbidity in adults in England. It measured the associations between multimorbidity and health service utilisation (Cassell et al., 2018). The collected, quantified data allowed the researchers to conclude that multimorbidity was prevalent, socially patterned, and linked with increased health service usage within the English population. The findings, which were retrospectively collected, helped support the need to enhance the quality and efficiency of health services provided to patients with multimorbidity at both practice and national levels within the English population.

A handful of recent healthcare studies that have primarily focused on SARS-CoV-2 have also adopted both types of observational studies to explore the effects of diseases and have allowed researchers to share consistent or emergent findings regarding the disease (Guaraldi et al., 2020; Liao et al., 2020; Taquet et al., 2021). Thus, these examples of cohort studies were in line with the aims of this study to obtain data regarding an event that had already occurred and look ahead to understand what could be done to prevent future detrimental effects of the problem.

Figure 4*Cohort Study Design*

Note. This model is an illustration of the cohort study design produced by Wang and Kattan in 2020. From 'Cohort Studies,' by X. Wang and M. Kattan, M., 2020, *Chest*, 158(1), p.S73.

On the other hand, a survey design would provide researchers with statistical data on the views of the participants regarding a phenomenon (Creswell, 2014). It would include obtaining data such as opinions, attitudes, and beliefs (Creswell, 2014). It could be achieved by using questionnaires or structured interviews (Creswell, 2014; Yilmaz, 2013). For example, an English study to appraise the feasibility of using patient-reported outcomes assessed for long-term conditions in primary care adopted the cohort survey design (Peter et al., 2014). The authors shadowed the cohort survey study with the explanatory sequential mixed-methods design. In addition, the authors pointed out in the study's results section that the cohort survey baseline results and a follow-up survey were administered to collect longitudinal data to measure the long-term effects of the phenomenon (Peter et al., 2014).

The authors reasoned that it served multiple purposes: first, it helped identify the respondents' practice, and second, it helped match baseline and follow-up responses (Peter et al., 2014). This example further sustained this study's reasonings for adopting a cohort survey design that shadowed the primary research design.

Phase 2 – Qualitative phenomenology study. Research has described the phenomenology study as a qualitative research method aimed at exploring and understanding individuals' lived experiences within a particular phenomenon or situation (Bhattacharjee, 2012; Polit et al., 2021; Rutberg & Bouikidis, 2018; Scotland, 2012). It aimed to uncover the essence and meaning of these experiences described by the participants. The primary goal of the phenomenology study would involve gaining insights into how individuals perceive, interpret, and make sense of their world in areas where little was known before research exploration (Bhattacharjee, 2012; Polit et al., 2021).

Polit et al. (2021) added that the other key objectives of a phenomenology study included:

1. *Identifying common themes* involved analysing the data collected from participants' descriptions to identify common themes, patterns, and structures that emerge across different individuals' experiences. These themes would provide insights into shared aspects of the phenomenon under investigation.
2. *Avoiding assumptions* would emphasise the suspension of preconceived notions and assumptions about the phenomenon being studied. The researcher would strive to approach the research with an open and non-judgmental attitude, allowing participants' experiences to guide the exploration.
3. *Contextualising experiences* would involve researchers to situate participants' experiences within the broader context in which they occurred. It included

considering cultural, social, historical, and situational factors that might influence how individuals experience and interpret the phenomenon.

4. *Generating theory* as a result of capturing the essence of the phenomenon.

These frameworks could help guide further research and understand related concepts.

5. *Promoting empathy and a deeper understanding of human experiences* by immersing oneself in participants' descriptions, researchers and readers alike could gain insights into the emotional and cognitive aspects of the phenomenon.

In general, the literature has described the study of phenomenology as a valuable approach to exploring subjective experiences and gaining a holistic understanding of how individuals perceive and interact with the world around them. It has commonly been used in nursing to shed light on diverse aspects of the human experience, such as patient care and pain management (Polit et al., 2021). For example, Anker et al. (2017) used the phenomenology study design, precisely the principle of hermeneutic phenomenology, to investigate and understand graduate nurses' experiences participating in a transition programme from a single metropolitan hospital in South Australia. With the aid of the principle of hermeneutic phenomenology, the researchers were able to conceptualise 'transition' as a summary of graduate nurses' experience transforming from a student nurse to a professional nurse based on the language of transition as described by the participants.

Similarly, Ingvarsdottir and Halldorsdottir (2017) used the hermeneutic phenomenology as their research methodology to explore and understand the perspective of experienced operating theatre (OT) nurses regarding enhancing patient safety in the OT. The method allowed the researchers to provide a deeper understanding of the OT's working conditions that might have led to patient safety issues and were able to bring forward

recommendations to enhance processes to enhance the identified issues. Although there were other available study designs for both quantitative and qualitative designs, those designs have been considered thoroughly and were justified as inappropriate for exploring this study's research topic. For example, case study designs were focused on examining a single subject or group (Hedges, 2015). Furthermore, the design was bound by the activity and time of the case (Creswell, 2014). However, with the study's aims, the event had already occurred, and the purpose was to obtain already known data and understand the problems' future effects through impersonal accounts.

On the other hand, grounded theory aims to investigate behaviours and effects within a culture through theory development (Creswell, 2014; Glaser & Strauss, 1967) and seeks to form an explanatory theory of human behaviour (Morse & Field, 1995). Again, a theory had already been proposed concerning this study's aims. Lastly, an experimental design was considered irrelevant to the research topic as the study did not seek to examine if a specific treatment would influence an outcome (Creswell, 2014).

To summarise, the first part of the chapter's section discussed the reasoning to substantiate adopting the explanatory sequential mixed-methods design with the cohort survey design and phenomenology study incorporated into it and the restatement of the research problem and purpose. The grounds for the decision for the adopted designs were also argued using current peer-reviewed research and textbooks. In the next section of this chapter, the author will describe the population and sample for the research study.

Population and Sample of the Research Study

This section will discuss the description of the population that would be recruited and present the sample sizes required, the sampling method undertaken, and the sampling frame used to determine the sample sizes needed. Finally, within the section, a description of the construct measured, coding schemes, and instrument properties will be presented.

Population of the Research Study

This study recruited nurses who newly joined the OR unit in a public hospital group in Singapore. It involved nurses in all OR unit areas, including the reception and admission area, anaesthetic, operating room and recovery room (Rothrock, 2019). The nurses in these areas included Admission, Anaesthetic Nurses, Post-Anaesthesia Care Unit (PACU) and Scrub and Scout nurses (Rothrock, 2019). The definition of each nurse's roles has been described by OR nursing authors as follows:

- ***Admission Nurse*** – Nurses who worked in the reception and admission areas were the first point of contact for patients undergoing surgery. These nurses were involved in pre-admission activities such as sustaining all available data from patients' medical records and confirming with patients and the surgical team for correctness and addressing discrepancies. It ensured that patients were prepared accordingly and safe to proceed with their planned procedure.
- ***Anaesthetic Nurse*** – Anaesthetic nurses were involved primarily in assisting anaesthetic doctors (anaesthesiologists) with the induction and extubating of patients undergoing surgical procedures. Additionally, they assisted in preparing the necessary requisites for anaesthesia, such as checking the anaesthetic machine and monitoring patients' vital signs.
- ***PACU Nurse*** – PACU nurses were a group of nurses involved in managing the recovery of patients post-surgery. These nurses were in charge of the pain management of patients and the cardiovascular, neurological and respiratory assessment. Based on the management assessment, PACU nurses would communicate with the anaesthesiologist for a patient's discharge to the appropriate care unit.
- ***Scrub Nurse*** – Scrub nurses were sterile surgical team members who directly assisted a surgical team of doctors with a surgical procedure within the operating field. They

were responsible for preparing the surgical instruments and other requisites required for surgery and the accountability of items used in surgery that prevented foreign body retainment in the patient's cavity.

- **Scout Nurse** – A scout nurse, or in present-day OR practice labelled as the circulating nurse, was similar to the role of a scrub nurse. However, they were a non-sterile member of the surgical team that helped manage the patient care aspect outside the surgical field. It included checking the expiry dates of equipment, goods and implants that were used for the procedure, documentation and issuing of medication to the sterile surgical team (Australian College of Perioperative Nurses [ACORN], 2022; Mayo Clinic, 2021; National Health Service [NHS], n.d.; NSW Health, 2019).

In addition to including the nurses described above, for both phases of the study, only nurses aged between 19 and 45 years old who were registered under the SNB as RNs or ENs were included. Additionally, they must not have worked in the OR unit after completing their student nursing for more than two years and were English literate. Also, experienced nurses new to their current OR unit work were included. Nurses excluded from the study included those who did not fit the demographics of the inclusion criteria. These nurses were deemed not to provide the study with the data required and, thus, unable to contribute to its overarching outcomes (Neuman, 2014; Creswell, 2014).

Additionally, when the primary inclusion criteria could not be reached during data collection, the researcher expanded the inclusion criteria and recruited nurses who had worked in their OR for less than three years, as their experiences were still current at the point of the research. The recruitment efforts employed by the researcher were supported by previous authors sharing that new nurses and nurses in a working environment like the OR took at least two to three years to submerge in their roles (Benner, 1984; Ball et al., 2015). Thus, the inclusion criteria demographics aligned with the descriptions in the literature.

Sampling Methods

The author derived the inclusion criteria based on literature that has been reviewed, which reflected the group of nurses who faced the issues identified in the problem statement. Furthermore, based on the extant literature, the population sample selected was based on three sampling methods: convenience, purposive and snowball sampling. These sampling methods were chosen because of the characteristics of each method and their suitability due to the challenges faced in reaching the targeted population due to the change in focus of research during the SARS-CoV-2 pandemic. Recent researchers have also adopted the convenient snowball sampling method due to logistics issues concerning participant accessibility due to the SARS-CoV-2 pandemic (Al-Mohaithef & Padhi, 2020; Doshi et al., 2020). Other authors pointed out that such a sampling method was often adopted in research studies as participants were hard to reach due to the demographic uniqueness, ease of accessing subjects and time efficiency (Etikan & Babatope, 2019; Parker et al., 2020). Thus, at the point at which the study was conducted, these sampling methods were adopted based on accessibility and practicality (Etikan et al., 2015).

In comparison, in a non-pandemic situation, the study would have adopted simple random sampling because it would have allowed any subjects within the inclusion criteria to have an equal chance to participate in the study (Alvi, 2016; Rahi, 2017; Elfil & Negida, 2017; Martínez-Mesa et al., 2016). Moreover, a simple random sampling method would reduce sampling errors and bias by selecting the studied population using randomisation (Rahi, 2017; Willson & Stonecypher, 2015; Hill & Dever, 2013). Thus, the random selection process would have minimised the effect of sampling errors and created more representativeness of the sample of the whole studied population (Willson & Stonecypher, 2015; Hill & Dever, 2013). Likewise, Hing et al. (2011) shared that simple random sampling was the ideal method for questionnaire surveys as the data collection tool (questionnaires)

aims to collect a pre-determined quantitative group of data from a pre-determined population. Hence, precise sampling would decrease bias (Dawson, 2019; Hing et al., 2011).

Conversely, snowball sampling has been known for its selection bias due to its flexibility and networking recruitment techniques (Etikan et al., 2015). Thus, the sampling method instilled a lack of external validity, generalisability, and representativeness of the targeted population (Parker et al., 2019). Nonetheless, as discussed in the earlier chapters, the targeted population at the point of undertaking the research were hard to reach due to the redeployment of nurses and a pause in elective surgeries, as informed by the nursing management, research boards, and the human resource departments of the hospital approached. Thus, human resources were either not required in the ORs, or no new workforce was allocated to the unit. Furthermore, at the point of the research undertaking, the area focused on nursing research was issues associated with SARS-CoV-2. Thus, snowball sampling was recommended at the point of conducting the study as it helped recruit samples that were not readily available during a crisis (Willson & Stonecypher, 2015). Additionally, to reduce any sampling error, only participants who fit the description of the inclusion criteria were carefully approached for the study based on OR nurses' gatekeepers' referrals.

Similarly, convenience sampling adopted for participant recruitment for the study shared similar traits to snowball sampling. Convenience sampling would use participants who were easily accessible to a researcher but were generally representative of the targeted population (Etikan & Babatope, 2019; Martínez-Mesa et al., 2016; Willson & Stonecypher, 2015). It has often been used for pilot studies to gain insights before running the full pledge study (Etikan & Babatope, 2019). Furthermore, it would be a less costly and time-efficient method that would help researchers reframe unclear research questions and insert more insightful questions to boost responses (Etikan & Babatope, 2019). Similarly, to avoid sampling error and bias, this study took an extraneous effort to approach parties that met the

inclusion criteria. It was done through gatekeepers from Singapore ORs who were seniors in the department and referred the survey to participants who met the inclusion criteria. The method was undertaken similarly to the reasoning for snowball sampling, as discussed in the previous section.

Subsequently, purposive sampling was selected because the sampling method was aimed at targeted participants to gain insights into the phenomenon (Avgousti, 2013; Alvi, 2016; Rahi, 2017; Elfil & Negida, 2017; Martínez-Mesa et al., 2016; Palinkas et al., 2013). As Creswell (2014) shared, adopting the purposive sampling method in an explanatory sequential mixed-methods design for the qualitative phase would purposively select samples based on the quantitative phase of the study. Besides, it was the most effective method, considering the inadequate and unique identification of samples in association with the research study (Etikan & Bala, 2017). Martínez-Mesa et al. (2016) also pointed out that the sampling methods selected in cohort studies must represent the targeted population. Thus, with such compelling evidence from the extant literature, it sustained the selection of the sampling methods that the research had chosen for the study that were in line with the inclusion criteria and timing of the study undertaking and its overarching goal to gain insight into the study's phenomenon.

Sample Size

The sampling size of the study was based on the formula $n = N / [1 + N (e)^2]$ by Taro Yamane (1967), where n = the sample size, N = the total population, e = the level of significance or limit of tolerable error, and 1 = constant. The sample recruitment size was based on the approximate intake of NJNs into the OR unit each year in Singapore public hospitals, which was estimated at 80 per cohort (per year) with a total of 160 sample size aimed to be recruited from two separate cohorts, in line with the inclusion criteria, for the

quantitative phase. Based on the formula, below was the calculation that derived the 114 sample size required with the level of significance set at 0.05.

$$n = N / [1 + N (e)^2]$$

$$n = 160 / [1 + 160 (0.05)^2]$$

$$n = 160 / [1 + 160 (0.0025)]$$

$$n = 160 / [1 + 0.4]$$

$$n = 114.2857 \approx 114$$

Eight participants from the quantitative study were later recruited for the qualitative phase, possibly recruiting more participants in case data saturation could not be reached. The concept of theocratical sampling in Glaser & Strauss determined the approach of data saturation. The authors' textbook stated that data saturation occurred when theoretical data were reached (Glaser & Strauss, 1967). It would occur when no new information or insights could be retrieved from the participants (Barker et al., 2015; Creswell, 2014; Glaser & Strauss, 1967; Guest et al., 2020).

Additionally, the eight participants recruited for the initial qualitative data collection recruitment might have been altered depending on the base size. The literature described base size as a denominator derived from the body of information already identified in a dataset (Guest et al., 2020). Besides, as purposeful sampling, a non-random technique, was used to recruit participants for the qualitative research, a set number of participants was not required (Tanujaya et al., 2017). Nonetheless, a target was set to ensure that the researcher approached as many participants as possible if data saturation could not be reached. In essence, based on the discussion of the sampling methods and the estimation of each sampling size that had been addressed, sampling bias issues such as under-coverage, over-coverage, and multiplicities samplings were determined biased (Hill & Dever, 2013) were reduced for this study.

Construct and Measures

The construct measured in this study was '*impacts*'. The term construct has often been confused with the term variable. Thus, to oversimplify both definitions, constructs were described as abstract ideas (intangible) applied to express phenomena that could not be expressed numerically (Bhattacharjee, 2012). This construct was applicable for the study's qualitative phase as construct theory has generally been adopted in qualitative research to unveil intangible concepts (Bhattacharjee, 2012; Creswell, 2014; Hossain, 2020). On the other hand, concrete variables, which included age, time and weight, were measurable (Bhattacharjee, 2012). The measures that measured the study's construct (coding scheme) included causes, types, effects, and behaviour presentation that had led to the challenges the impacts of nursing IPs had on NJNs in Singapore OR units.

For the quantitative aspect of the study, the construct measures were pre-tested through a pre-test survey study to identify threats to the internal validity instrument (closed-ended survey questionnaires) (Ruel et al., 2016). It ensured that questionnaires were tested for validity and reliability by administering them to a small sample group of the targeted population (Adams et al., 2014; Jones et al., 2013). The purpose was to evaluate the construct measured accurately using the data collection instrument and tool (Willson & Stonecypher, 2015). Additionally, expert reviewers were done to identify threats to the internal validity instrument and ensure that quantitative surveys used the right questions, which helped ensure the instrument's validity and reliability (Ikart, 2019). Two 5-point Likert scales were used to measure the response to each question. An advantage of using a Likert scale was the ease of reading and responding to items, development, and adaptability to most measured events (Balasubramanian, 2012). A sixth point was included; however, it was not measured to acknowledge questions that participants did not experience. The two 5-point Likert scale included the variables presented in Table 2 below.

Table 2*Quantitative Questionnaires Likert Scale Scorings*

Score Type 1	Score Type 2
1. Strongly agree	1. Very Satisfied
2. Agree	2. Satisfied
3. Neutral	3. Neutral
4. Disagree	4. Dissatisfied
5. Strongly Disagree	5. Very Dissatisfied
6. N.A. (Not applicable).	6. N.A. (Not applicable).

The sample questions in the 5-point Likert scale were as followed:

Table 3*Examples of Questions for Each Measures in 5-point Likert Questions*

Measures	Questions
Behaviour presentation	I was given sufficient time, at my level, to reach the competency level for my new job role before I was confirmed.
Types	My new job role in the OR was effectively explained during the induction programme.
Effects	I faced challenges after undergoing the induction programme as I was unable to put theory into practice based on my level of OR nursing.

A nominal scale was used to measure variables such as age, years of service and 'yes-no' to relevant questions. It would be elaborated further in the next section. The behaviour presentation was measured using the nominal scale. A sample question of this nominal scale 'yes-no' included:

Table 4

Examples of Questions for Each Measures for Nominal Scale

Measures	Questions
Causes	Were you assessed on your knowledge and skills that were required of your job role during the phase of the induction programme?
Effects	I would recommend the OR unit nursing specific specialisation induction programme I underwent to future new staff?

Likewise, to improve the validity in the qualitative phase of the study, the findings are referred to as the findings from the quantitative phase (Creswell, 2014). Additionally, a comparison of findings from previous literature was performed to ensure consistency across the field associated with the phenomenon (Creswell, 2014). Research has described this technique to strengthen the outcome of a study as data triangulation would be achieved by using heterogeneous data sources to collate and analyse data involving time, space, and persons via multiple sources and techniques (Wilson, 2014; Noble & Heale, 2019).

In conclusion, this section has discussed the description of the recruited population by presenting the inclusion and exclusion criteria. Also, the required sample sizes were introduced, and an explanation of how the researcher derived the numbers from a simple formula previous authors had adopted for the sampling methods undertaken was discussed. Finally, a description of constructs measured, coding schemes, and instrument properties were presented, and the argument for validity and reliability was described. The following section will discuss the materials and instrumentation of the research tools of this study.

Materials/Instrumentation of Research Tools

Within this section, the author will introduce the instruments used for the study. A discussion of its origin, reliability, validity and expert reviews will also be presented. Additionally, the results of the survey pre-test will be discussed.

The study used a self-developed survey questionnaire, which the researcher named the IORNTSP survey, which was an abbreviation for ‘*Impacts on Operating Room Nurses with Transitional Support Programmes*’ survey (Appendix G) for the quantitative study and an open-ended interview questionnaire (Appendix H) as there were no existing validated surveys that were designed to explore impacts of OR nursing IP on OR NJNs to explore the construct of the study. The study’s instrument tools were developed following *The MEASURE Approach* developed by Kalkbrenner (2021) (Figure 5). This approach was developed to significantly help graduate students who had trouble accessing databases or textbooks for these resources as they were already financially burdened or had limited access to these resources from school and internet databases due to the requirement for product purchase or organisation affiliation to gain access (Kalkbrenner, 2021). Recent studies have also adopted this new tool to aid instrument development (Lancaster et al., 2021) and the validity and reliability of psychometrics scores testing (Flinn & Kalkbrenner, 2021).

Figure 5

The MEASURE Approach

Make the purpose and rationale clear
 Establish empirical framework
 Articulate theoretical blueprint
 Synthesize content and scale development
 Use expert reviewers
 Recruit participants
 Evaluate validity and reliability

Note. This figure was produced by Kalkbrenner in 2021, illustrating the abbreviations of the MEASURE Approach. From ‘A Practical Guide to Instrument Development and Score Validation in the Social Science: The Measure Approach,’ by M.T. Kalkbrenner, (2021). *Practical Assessment, Research, and Evaluation*, 26(1), p.2.

M – Make the Purpose and Rational Clear

Other survey instrument tools, such as the *Casey-Fink Graduate Nurse Experience Survey*, have been explored for data collection in previous studies to examine the effectiveness of OPs for new graduate nurses (Boswell & Sanchez, 2020; Pertiwi & Hariyati, 2019). The researcher considered the tool to measure the construct for the study. However, the construct measured in the survey tool covered only a brief aspect of the measures of this study. For example, the instrument measured new graduates' transition in two phases – upon entry to the workplace and transition to professional practice (Casey et al., 2004). Additionally, the tool was generally used to measure graduate nurses' stressors, fears, and challenges during their first year of professional practice (Casey et al., 2004). It demonstrated the transition challenges of new graduates. It reflected, similar to the extant literature, the six to twelve months adjustment period new graduates required to transition into their new job role (Casey et al., 2004). A recent survey revision reflected the current expansion of nurses' role in healthcare practices (Casey & Fink, 2021). However, like the initial tool, the gap in measuring the impacts nurses faced after undergoing their orientation or induction programmes was still present.

The author also explored the *PPCS-R* and examined its reliability of usage to explore this study. However, it was determined not to be suitable. It was because the *PPCS-R* was developed as a self-assessment tool to assist OR nurses in recognising their areas of strengths and weaknesses (Gillespie et al., 2012). The 40 items in the *PPCS-R* tool measured OR nurses' perceived level of competence according to the following aspects: Collaboration, Empathy, Foundational Skills and Knowledge, Leadership, Proficiency, and Professional Development (Gillespie et al., 2012). It was an excellent tool to measure OR nurses' perceived level of competence; however, none of them, in the contents of the *PPCS-R*,

measured related to the orientation or induction programme of OR nurses. Thus, it was concluded to be an incompatible tool to measure the areas in this study.

In contrast, research has shared that similar studies exploring specific constructs relating to new nursing graduates' perception of their OP effectiveness had used self-developed instrument tools (Baldwin et al., 2016; Horwarth, 2010; Murphy & Janisse, 2017). However, the purpose of these previous authors to self-develop instrument tools was to achieve a better outcome of their result findings to answer their research questions and hypotheses, as their self-developed tools measured their phenomenon of interest more precisely than established instrument tools. Likewise, the self-designed tools for this study aimed to articulate measures specific to the phenomenon being studied. Furthermore, the self-designed tool of the study filled gaps in aspects that measured the orientation or induction programmes of OR nurses in Singapore that were missing in previously established measurement tools.

E - Establish Empirical Framework

The MEASURE Approach's second stage would task researchers to adopt a theory or synthesise findings from existing literature to develop an empirical framework for the item development stage (Kalkbrenner, 2021). As discussed in Chapter 1, this study adopted Benner's '*From Novice to Expert*' theory and Warren and Mills's '*Conceptual Model of Nursing Motivation*' to guide the context of the study's phenomenon. Kalkbrenner (2021) stated that the aim of stage two of the approach was to issue a synopsis of the theoretical support structures for the projected construct of measurement. It was essential to make secure content validity or the extent to which test items sufficiently represent the breadth of a construct of measurement (Lambie et al., 2017).

In the synopsis of theories discussed in Chapter 1, the theories aided in gaining insights towards this study phenomenon and have helped develop the research instrument

tool at this stage of the study. For example, Benner's model focused on the nursing profession and hypothesised that these individuals would undergo five stages of skills and knowledge acquisition (Benner, 1984). The five stages included novice, advanced beginner, competent, proficient and expert (Benner, 1984). On the other hand, Warren and Mills's '*Conceptual Model of Nursing Motivation*' was developed to explore the motivating factors for nurses to return for an acute care advanced degree or RN diploma (Warren & Mills, 2009). Warren and Mills (2009) found that if an organisation acknowledged the barriers to nurses' motivation seeded by organisational influences such as incentives and rewards, it would increase the success of motivating nurses to pursue higher education. The authors further suggested that individuals internalised these organisational influences through three related functions to self-evaluate individual traits and reduce motivational barriers. These included value, identity and utility (Warren and Mills, 2009).

The theoretical models adopted in this study were consistent with exploring the impacts of nursing IPs on NJNs in Singapore OR units. Based on the assumptions in each theoretical framework, the author developed the theoretical blueprints of the content and domain areas for questions in questionnaires, as discussed in the earlier sections. These included causes, types, effects, and behaviour presentations.

A - Articulate Theoretical Blueprints

Kalkbrenner (2021) referred to the theoretical blueprints for specific issues for the construct of measurement. As discussed earlier in the chapter, the construct of the study was '*impacts*'. Based on the extant literature, the theoretical blueprints discussed earlier were developed. The structure of the questions was also adjusted accordingly based on expert reviews for the breadth of measurement of each construct of measurement. It will be discussed in detail in the later section. Of the 44 variables in the quantitative survey questionnaires that were initially developed, 12 were descriptive data measured using a

nominal scale. These variables included demographics and time. Table 5 presents the initial pool of total questions that measured these descriptive data.

Table 5

Quantitative Survey Questionnaires Descriptive Data

Types descriptive data	Total questions
Demographics	7
Time	5

The demographic data included age, gender, job role and education status, while the time data included items such as the period in the OR unit and frequency. These variables were essential measurements because they helped determine whether the group within the classified demographic represented their population, thus allowing the generalisability of the findings (Allen, 2017). For example, questions such as collating ‘*years since graduating from nursing school*’ could determine the level of nursing expertise based on the five stages discussed in Benner’s theory. Furthermore, based on the abilities and traits of individual characteristics described in Warren and Mills’s model, it could determine the motivation influence and behaviour presentations with later questions in the survey. The questions linked to demographic data were uniquely designed based on the concept of the example discussed. They were developed to test for relationships between the independent (demographics) and dependent (construct measurements) variables.

Next, as discussed earlier, the proportion of items in content areas of the theoretical blueprint was based on justified from an extant literature review. Thus, the researcher evenly spread the questions of each content area to gain the breadth of insights of each content area. The researcher’s plan for identifying the questions in the quantitative content areas was for

easy data analysis input using keywords. Table 6 presents the initial pool of total items in each content area the study intended to measure.

Table 6

Initial Pool of Item in Content Areas of Quantitative Questionnaires

Content areas	Total questions
Causes	8
Types	8
Effects	8
Behaviour presentation	8

Similarly, the qualitative semi-structured interview questionnaires were developed with 32 initial pools of items. These included eight questions related to demographic data: age, gender, job role, education status and length of service in the OR unit. The rationale for collating these data was similar to the earlier quantitative item development discussion explanation. Applying similar demographic questions in the qualitative studies helped determine whether the group within the classified demographic represented their population and allowed comparison of perceptions among different demographic groups. The qualitative questions were designed based on the findings of the quantitative study to extract tangible information to explain those findings in depth. The tool was a guide to allow structure for the researcher during the interviews and was fluid when required, depending on the responses received.

Later, based on the four developed blueprints, the researcher similarly evenly laid out the initial pool of questions for the qualitative aspect of the study. Eventually, themes arose based on their discovery through participants' responses during the data collection stage (Creswell, 2014) guided by the developed blueprints. Also, the qualitative themes were

identified from codes for easy data analysis, identical to the identification process of the quantitative content areas discussed earlier. Table 7 presents the initial pool of total items in each content area that the study intended to measure for the qualitative aspect of this study after the quantitative study's pilot study was done.

Table 7

Initial Pool of Item in Content Areas of Qualitative Questionnaires

Content areas	Total questions
Causes	5
Types	5
Effects	5
Behaviour presentation	5

S -Synthesise Content and Scale Development

The next stage of the item development of the study was to synthesise the content and develop the scale to measure the construct measures. These processes involved using the empirical frameworks established for the study and the blueprints that have been conceptualised (Kalkbrenner, 2021). It was also recommended that an exhaustive list of items be created and later polished for redundancy during this stage of item development (Kalkbrenner, 2021). However, the method was more applicable if there were more than one researcher during the item development process. Thus, the author of the study used two alternative methods of developing an exhaustive list of items and later presented them for expert review and a survey pre-test. These methods helped enhance the rigour of the item development process as participants who met the characteristic of inclusion criteria and expert opinion might possess the tools to guide the item development procedure (Ikart, 2019; Kalkbrenner, 2021).

Subsequently, the process of developing each question included the following considerations. First, it was brief, clear and direct for the respondent to respond. Secondly, questions were relevant to the research aims, purpose and objectives. Third, the question flow was systematic to reduce the likelihood of respondent fatigue and, lastly, avoid question bias (Ikart, 2019; Kalkbrenner, 2021).

Additionally, as mentioned earlier, content areas were identified in the questions using critical words for ease of data analysis input. For example, verbs such as *was* and *did* identify questions related to *'causes'*. Also, each question was set to examine relationships between each variable. For example, questions designed for the *'types'* content areas were intended to link to the *'behaviour presentation'*. The four blueprints used as the initial codes for the qualitative data analysis presented the possibility of themes eventually arising based on the discovery of responses by participants during the data collection stage (Creswell, 2014).

Following that, as discussed earlier, the Likert scale was used to measure the responses to each question. Likert scales have been commonly used in social sciences research as they aid in appropriately measuring attitudinal constructs, including beliefs and emotions (DeVellis, 2016). It was in line to measure how each participant agreed or disagreed with a particular question. Additionally, research has stated that Likert scales were special tools during expert review as they allowed experts to identify problems with constructed questions and provide feedback to fine-tune questions that would aid in collecting optimal measurements (Ruel et al., 2016). Binary scales such as *'yes'* or *'no'* were also utilised in some questions to assume the values of two possible outcomes of a dichotomous view (Bhattacharjee, 2012; Kalkbrenner, 2021). Lastly, as discussed earlier, nominal scales were used in the survey as these variables were essential measurements that helped determine a representation of the inclusion population, thus allowing the

generalisability of the findings (Allen, 2017). A more detailed presentation of each operational definition will be presented in the later section of this chapter.

U - Use Expert Review

Next, after finalising the instrument tools, the author presented the questionnaires for face and content validity using an expert panel of nursing practice leaders and academic educators. These included four expert reviewers who collectively had over 52 years of experience working in the nursing field and nursing school. All reviewers were subject matter experts in speciality care units and were active preceptors, instructors and educators in practicum, which was an essential process for the item development of this study, as mentioned earlier. Moreover, by adopting independent expert reviewers, the study's author analysed the consistency of the feedback regarding the instrument tools (Ikart, 2019). A survey pre-test was also done with the expert reviewers and a handful of other senior OR nurses. The purpose of the survey pre-test was to enhance the credibility of this study (Ruel et al., 2016), similar to performing a pilot study (Kalkbrenner, 2021; Ruel et al., 2016). It included acknowledging difficulties in answering questions due to a lack of comprehension or inconsistency of scale before conducting the study's main scale (Ikart, 2019; Ruel et al., 2016). Lastly, a final review from the Unicaf University School of Doctoral Studies provided more authenticity to the newly developed tool. Thus, based on the collective feedback from the expert reviewers, fine-tuning of questions in the instrument tools was performed.

Firstly, the collective feedback from the experts was positive. The reviewers shared that the instrument tools were robust and directed. However, the expert provided feedback to improve the instrument tools' quality. Firstly, the experts pointed out that some questions were repetitive. Based on the feedback, the author reviewed these questions and was dutifully removed. Secondly, one expert (OR Nurse Clinician and Clinical Instructor) pointed out that the language of the questionnaires could be simplified to Singaporean English and shortened

to ease the readability for the participants who might find it challenging to comprehend British English.

Additionally, another expert (OR Clinical Nurse Educator) provided feedback on the grammar of some questions. It was an essential aspect of the questionnaires, as proper grammar played a vital role in the readability, clarity, and credibility of the questions and instrument tools. Moreover, ignoring grammar rules might lead to misinterpretation of the subject matter, thus leading to an overthought response (Ruel et al., 2016). Therefore, to eliminate such issues, the literature recommended that questions be composed at a grade-sixth reading level (DeVellis, 2016).

Subsequently, to allow respondents their version on their accounts regarding some questions, an expert (School Nurse Educator) recommended providing an additional option, 'others', for specific binary scaled questions. It involved questions that had 'yes' or 'no' options. The feedback was probed. However, based on the flow of the questioning, the additional options were not required as either option would have directed participants towards the next appropriate question based on their response.

Lastly, the Unicaf University School of Doctoral Studies commented that to allow more detailed statistical analysis, questions relating to the timeline of a variable in the quantitative survey should seek data for actual age and the number of years participants have been in their organisation and the number of years their organisation have been online. Also, it was feedback to create a third option for the gender questionnaire to align with gender-identity of current societal shift. The feedback was received, and changes and additions were made to obtain such information. It included having an open tab answer option instead of providing options for the participants.

The final pool of questions was set upon fine-tuning the questions in the instrument tools based on the feedback given by the expert reviewers. There were 43 items in the

quantitative survey and 24 items in the qualitative survey questionnaire guide. Tables 8 and 9 present the finalised pool of questions in each content area in each instrument tool, and the final version of the instrument tools were forwarded to this study's supervisor and the Unicaf University School of Doctoral Studies.

Table 8

Quantitative and Qualitative Survey Questionnaires Descriptive Data

Types Descriptive Data		Question Number (QN)
Quantitative	Demographics	1,2, 6-8, 11, 13, 23, 40, 41
	Time	3-5, 9, 22
Qualitative	Demographics	1-5
	Time	6, 8

Table 9*Quantitative and Qualitative Content Areas*

	QN	Total questions
Quantitative	Causes 10, 12, 19, 20, 21, 24, 25, 43	8
	Types 27, 29, 31 - 34, 36, 37	7
	Effects 26, 28, 30	3
	Behaviour presentation 14 – 18, 35, 38, 39, 42	9
	Causes 7, 10, 12, 19	4
Qualitative	Types 9, 11, 17, 18, 20	5
	Effects 13 - 16	4
	Behaviour presentation 21 - 24	4

R - Recruit Participants

Thirteen participants were recruited for the survey pre-test for the quantitative aspect and two for the qualitative aspect. The recruited participants were employed using convenience sampling. They were all currently practising as OR nurses, except one participant who had moved to another nursing practice area during the pre-testing of the

survey. The participants were requested to supply feedback based on how the survey structure flowed, any areas that hindered the flow of questioning and the time it took to complete the questionnaires. Based on the feedback, there was one collective feedback concerning a participant identification number (ID). Initially, the author designed this value to give each participant a unique ID number. However, as evidenced by the sampling recruitment method, this was not feasible. Thus, some initial participants initiated inserting the alphabets of their first and last names, which was later informed to employed for the later participants. However, after the research tool was reviewed by the Unicaf University School of Doctoral Studies, it was determined that this information requirement should be removed to maintain the anonymity of participants and only seek the email addresses of participants who are willing to participate in the follow-up study.

Subsequently, the participants shared that completing the quantitative questionnaire took roughly 10 to 20 minutes. On the other hand, the qualitative aspect took approximately 30 minutes to complete. There was no feedback on issues in the comprehension of questions, and no frustration was acknowledged in completing the pre-test survey. Lastly, based on the input given, the results from the pre-test showed effectiveness in responses as there was no omission of questions or need for assistance in answering any questions. It indicated the motivation to continue and engage the survey flow (Ikart, 2019).

E - Evaluate Validity and Reliability

The last step of The MEASURE Approach was to evaluate the validity and reliability of the instrument tools. It involved ensuring that the scale measurements of the tools measured what they were intended to measure and validated the consistency of the scores (Kalkbrenner, 2021). The reliability of the self-developed instrument tool was assessed using Cronbach's alpha. At the same time, the Exploratory Factor Analysis (EFA) was performed via the Kaiser-Meyer-Olkin (KMO) after confirming that the data were appropriate for factor

analysis to evaluate the construct validity of the self-developed instrument tool. Three constructs were tested for reliability and validity: Behaviour Presentation, Types, and Effects of the impacts of OR nursing IP on OR nurses in Singapore.

Upon completion of the survey pre-test, the researcher evaluated the validity and reliability of the self-developed quantitative survey tool (IORNTSP survey) according to the methods discussed earlier. Firstly, the KMO showed a value of 0.56, signifying that the selected variables were acceptable for factor analysis (Maskey et al., 2018; Shrestha, 2021). Next, the EFA, an analytic tool that aided investigators in determining analytically how many constructs, latent variables, or factors govern a set of items (DeVellis, 2016; Maskey et al., 2018; Shrestha, 2021), revealed twelve latent factors. However, the Eigenvalues revealed only seven factors with a score of 1.0 or higher, which indicated the five redundant factors in the analysis (Koyuncu & Kılıç, 2019). Furthermore, after running a Varimax rotation, the final latent factors were reduced to two. Collaboratively, each factor had a factor loading of 0.053-0.93. Finally, Cronbach's Alpha test of 0.82 indicated the internal consistency of the scale of the self-developed quantitative instrument tool, which was an acceptable range based on the extant literature (Kalkbrenner, 2021). However, the statistical tests might be inaccurate due to the low sample size. Nonetheless, it provided some relevance for analytical tests to evaluate the validity and reliability of the instrument tools.

In summary, this section has described the development process of this study instrument tools using Kalkbrenner's *'The MEASURE Approach'* model of research survey instrument development. This section has also discussed the measures to demonstrate the validity and reliability of the tools by seeking subject matter experts to provide feedback through their expert review. A survey pre-test was also included to establish the validity and reliability of the tools. It included inviting survey participants who fit the study's inclusion

criteria and providing their feedback on the self-developed tools. The following section of this chapter will discuss the operational variables of this study.

Operational Definition of Variables

This section will discuss the following operational definitions used for this study. The variables and their definitions used in this study included Perioperative Nurses, IPs, Types of Causes, Types, Effects and Behaviour Presentation. This section would also label the variables according to variable types, such as controlled, independent and dependent variables.

Variable 1. Perioperative Nurses

As discussed earlier in Chapter 2 of the study, the conceptual definition of perioperative nurses in the literature was a group of nurses who worked in a sub-division unit within the hospital organisation specialising in OR nursing care for patients undergoing elective and emergency surgical procedures (Gutierrez et al., 2018). Perioperative nurses included a variety of nursing roles. These roles included pre-admission nurse, anaesthetic, scrub, scout, PACU nurse and theatre sterile supply unit (TSSU) nurses (NHS, n.d.; Wu & Taylor, 2020). These nurses also held different seniority within the OR team and functioned accordingly based on their hierarchy. However, their fundamental roles as patient advocates remained regardless of these implied hierarchies. In this study, the definition of perioperative nurses was determined in condition to the inclusion criteria derived from previous research as the most impacted group of nurses within the nursing profession, specifically perioperative nursing (Averlid & Høglund, 2020; Hung et al., 2018; Lögde et al., 2018; Numminen et al., 2015; Oritz, 2016). In addition, they included new nurses with OR nursing experience ranging from no experience to twelve months. However, the study's range was expanded to no more than three years of OR nursing experience. It agreed with Benner (1984), who pointed out that professional nursing practice was generally achieved after two to three years.

Evidence from the extant literature showed that OR nurses' competence was generally achieved at least two to three years after submerging in the OR nursing environment (Ball et al., 2015). Also, the operational definition was expanded to perioperative nurses who were pre-admission nurses, anaesthetic, scrub, scout, and PACU nurses who were either ENs or RNs as they had direct patient care contact (NHS, n.d.; Wu & Taylor, 2020). The information on this variable was obtained from raw data through the self-developed survey questionnaire developed by the researcher of this study. It included nominal and interval scales with the nominal scaled data including items such as male or female, nursing degree, and nursing diploma.

Conversely, interval scaled data included items such as the longevity of a specific event. Likewise, as described by the extant literature, data involving perioperative nurses were essential to be observed in this study. Firstly, the level of measurement of specific data such as age, education level and working experience could deliver different perceptions among different groups. Thus, it could provide a more robust finding.

The operational definition in this study could be similarly observed in the extant literature in the inclusion criteria of those studies. For example, in a study by Pupkiewicz et al. (2015) exploring '*What factors within the perioperative environment influence the training of scrub nurses?*', the authors defined their perioperative nursing participants as either novice scrub nurses who were learning and required guidance or senior nurses who were guides for these novice nurses. They further classified these perioperative nurses as ENs or RNs with less than a year of experience, senior clinical nurses in charge, and OR nurse educators. Similarly, in Shin and Kim's (2021) study, the operational definition of perioperative nurses was specific to nurses who work in the OR as circulating and scrub nurses and nursing educators and managers. Lastly, in addition to the variable's operational definition, this variable was labelled as a dependent variable. Also, the controlled variable of

understanding the relationship between time and experience was included. It involved a time scale that helped understand how it manipulated the independent variables, which will be explained in the following sections of this discussion. An example included how an RN with one week of specialised IP compared to an RN with more than four weeks of a similar programme would describe their experience.

Variable 2. Induction Programmes (IPs)

As discussed in the literature review section of the study, IPs were TSPs to assist in bridging theory-to-practice gaps and making sound support systems accessible. These programmes acted as introductory programmes to supply nurses with an overview of their newly appointed role in the unit (Cushway, 2011; Moriarty et al., 2011). Additionally, it was a means to reduce the transitional challenges of new graduates and nurses new to a clinical environment. Regardless of professional experience, the new work environment was found to be equated to a work experience similar to a novice nurse because of the need to adapt to a new environment that could be challenging and stressful (Benner, 1984). Thus, it impacted their ability to practice at a professionally desired level.

The extant literature also shared that the definitions of nursing induction and orientation programmes have been interchangeably cited in human resources and nursing research. However, as discussed in the previous chapter, the purpose of each programme differed, with the latter being a programme to help understand an overview of the work environment, organisational structure and job roles. Nonetheless, as mentioned, these terms were used interchangeably in different studies according to the investigators' operational definition. Similarly, in this study, the operational definition of *IPs* included any TSPs NJNs were given when they embarked on their new OR unit delivered by clinical nurse educators, senior OR nurses or nursing managers. The information on this variable was obtained from raw data through the self-developed survey questionnaire

developed by the study. It included nominal and ordinal scales. The list of nominal scaled data includes items such as yes or no. In contrast, the ordinal scaled data included items such as strongly agree to strongly disagree and very satisfied to very unsatisfied. In addition to the operational definition, this variable was labelled as an independent variable as the study determined if OR nursing IPs in Singapore impacted the OR nurse's working experiences.

Variable 3. Causes

Causes had no universal definition within the extant literature. However, it was defined by the dictionary as a motive for a reaction outcome (Merriam-Webster, n.d.a). The definition has been concurrently observed in the discussions in the extant literature. For example, using observation techniques first, Sergeeva et al. (2016) identified the causes of iPod use on the work performance of staff working in the OR after further analysis from participant interview quotations. Later, the causes were used as a measurement variable to translate the identified issues. Similarly, using The Casey-Fink Graduate Nurse Experience Survey, Casey et al. (2004) shared that 25% of their respondent had life stressors because of financial burdens. The outcome of the stressors (independent variables) was made known with an item question that led to another question to understand the causes of the stressors (dependent variables) in more depth.

Likewise, the same survey used in other studies reflected the operational definition of causes similar to the above two studies as a stimulant of action-reaction (Baker & Alghamdi, 2020; Maxwell, 2011; Rush, 2013). Therefore, in this study, the operational definition of *causes* was an action of a variable that had led to a particular reaction. For example, the causes of NJNs' challenges in their appointed job roles were because of the impact their OR nursing IPs had on them (dependent variable) were determined by seven questions in the self-developed tool. These items (independent variables) included:

1. Whether they received an IP upon joining their unit.
2. Whether the programme was specific to their job roles.
3. Whether the content was sufficient for their roles.
4. Whether the programme was insightful.
5. Whether they were assessed for their skills and knowledge linked to their job roles.
6. Whether they received guidance from their facilitator.

Being specific with an operational variable, such as causes in this study, has allowed the author to identify questions specific to describing and presenting the independent and dependent variables accordingly. The information on the variable (causes) was obtained from raw data through the self-developed survey questionnaire that the study developed, similar to the previous two and the following three variables. It included nominal and ratio scales. The nominal and ratio scaled data list included items such as yes or no and time scale.

Variable 4. Types

As defined by the dictionary, types were various assorted variables (Merriam-Webster, n.d.b). The definition was similarly observed in the operational definition in the extant literature. For example, in a study by Innes and Calleja (2018), *types* were operationally defined as two variables: intervention types and support types. The authors collated these themes from several works of literature and discussed the TSPs of nurses in critical care areas. Similarly, in a study by Tovmasyan and Minasyan (2020), *types* were operationally defined as the motivation types that impacted employers' and employees' work efficiency during the SARS-CoV-2 pandemic. The types of motivation were inputted into an online sociological survey, and participants responded to each type of motivation accordingly based on the question structure.

In this study, *types* were operationally defined by events potentially impacting OR nurses' professional practice after undergoing their IPs. In addition, the types of events could potentially result in challenges OR nurses face in their daily professional practice and profession. These included workplace and job role introduction and the concept of OR nursing. The information on the variable (*types*) included nominal and ordinal scales. The nominal and ordinal scaled data list included items such as yes or no and two 5-Likert scales, measuring strongly agree to strongly disagree and very satisfied to very unsatisfied. The variable *types* were labelled as an independent variable with the impact OR nursing IP has on OR nurses, such as being satisfied or very dissatisfied being the dependent variable.

Variable 5. Effects

The dictionary has defined *effects* as an influence of a cause that would result in the desired result (Merriam-Webster, n.d.c). Similarly, the extant literature had operationally defined effects as agents that exuberate the desired outcome. For example, in a study by van Rooyen et al. (2018), the researchers used effects as an operational variable to explore the positive outcome of OPs. With the aid of the AGREE II tool, the researchers performed a thematic analysis and uncovered three factors to ease the transition of final year nursing students to professional nurses. These included 1) support for new graduates, 2) the graduate's need for socialisation and belonging needs of new graduates, and 3) a positive clinical learning environment. By operationally defining the term *effects*, the researchers were able to provide implications of their study that gave educational and healthcare institutes the availability and implementation of guidelines that could assist the progress of transition from being a final-year student nurse to becoming a professional nurse and improve the retention of retention NGNs.

Likewise, in another study by Schmidt and Brown (2018), *effects* were used as an operational variable to establish if undergoing an undergraduate perioperative nursing

elective influenced the career options of nurses four to nine years after graduating from nursing school. A qualitative survey was done to determine the effect of this phenomenon and successfully helped determine the potential long-term effect of including perioperative nursing electives into nursing school curricula. Similarly, this study defined *effects* as a selected variable that could influence perioperative nurses' impact on their IPs. These variables included receiving perioperative technical and theoretical skills, being part of a team and adaptation time. The information on this variable (*effects*) included an ordinal scale. The list of ordinal scaled data included a 5-Likert scale, strongly agree to strongly disagree. Similarly, as the variable *types*, the variable was labelled as an independent variable with the impact OR nursing IP had on OR nurses, such as being satisfied or very dissatisfied or agreeing or strongly disagreeing with a variable being the dependent variable.

Variable 6. Behavioural Presentations

The term behavioural has been defined as an action in which a person presents oneself (Merriam-Webster, n.d.d.). In this study, the operational definition of *behavioural presentation* was based on nurses' satisfaction level on an asked variable in the survey. It included overall satisfaction with the IPs they have undergone and adaptation time to adapt to their new role. This study's operational definition of behavioural presentation was similarly observed in the extant literature. For example, in a study by Kardefelt-Winther et al. (2017), the behaviour presentation of *behavioural addiction* was operationally defined as repeated harmful and persistent behavioural problems that could lead to significant harm or distress if such functionally impaired nature of behaviour persists over time. The researchers operationally defined behavioural presentation to help future research conceptualise addiction behaviours without pathologising common behaviours.

Similarly, in a study by Christopher et al. (2015), the authors discussed that in Karl Mannheim's 1923 generational theory, *behaviours* were operationally defined as the

imperfections of generational differences of nurses based on socialised ideals learned between these generations and realities of the world they experience. The theoretically positioned definition has helped the nursing profession understand the difference in behavioural presentation among nurses of different generations. The information on the variable (*behavioural presentation*) in this study included nominal and ordinal scales. The nominal and ordinal scaled data list included items such as open-ended textboxes and a 5-Likert scale, measuring very satisfied to very unsatisfied. The variable was labelled as an independent variable, with the behavioural actions of OR nurses due to their OR nursing IP impacts being the dependent variable. The independent variable included contents that measured the level of satisfaction OR units placed themselves with measurable variables associated with the induction programmes received.

In summary, this section has discussed the operational variables used in the study with references from the extant literature. The operational definitions have allowed the study to theoretically separate concepts that would not pathologise the common definition of the variables described in the dictionary. Furthermore, it has allowed each operational definition to be measured with the appropriate scale to assist in the investigation of the purpose of the study more intently. The next section of this chapter will discuss this study's study procedures and ethical assurances.

Study Procedures and Ethical Assurances

Before collecting data in the field, the researcher was first required to obtain ethical approval from the Unicaf University's Unicaf Research Ethics Committee (UREC). This section will discuss the details of the ethical approval process, describe how confidentiality and anonymity were achieved for participants and discuss the ethical issues involved and addressed. Additionally, a discussion of the precise steps to collect study data, addressing

how, when, where, and from whom or what they were collected, will be discussed to replicate this study.

Ethical Assurances

Prior to Collecting Study Data

Prior to collecting data for the study, the researcher maintained a diary to ensure a thoughtful review was done to prevent any possible bias prior to commencing the study during data collection and analysis. It was because the researcher came into the research with ten years of working experience in the perioperative nursing profession. Therefore, the researcher has experienced the impacts of different IPs received in various hospital organisations and OR units. Thus, the researcher's motivation to explore the impacts of nursing IPs on NJNs in Singapore OR units of the current generation was intended. To achieve the goal, the research objectives and purpose of the study were clearly outlined, and the broad research questions *"To what extent did having an OR unit-specific specialised nursing IP enhance OR unit nurses' knowledge and skills in performing new job roles?"* and *"To what extent did the challenges NJNs in Singapore OR face with the OR unit-specific specialised nursing IP affect their ability to perform their roles?"* were asked. The broad form of questioning allowed the researcher to avoid narrowing the focus of the study to reduce understanding of relevant concepts about the phenomenon (Creswell, 2014). Thus, the researcher of the study had chosen the research topic because of its applicability to an area of professional interest within a subject that was significant to the researcher and to the perioperative nursing profession in Singapore. Moreover, with few to no existing studies and research results regarding the research topic in Singapore, the study had significant implications for Singapore nursing and a fresh perspective on the issue among perioperative nurses in Singapore and internationally.

Although a reflexive review was undertaken prior to the commencement of the study, the researcher continued to detail his assumptions, beliefs and personal views throughout the study. These measures ensured that the researcher's behaviours, beliefs, and familiarity with the subject matter did not compromise the research outcome. Thus, the researcher recorded a few assumptions in his research diary before data collection, namely:

1. OR nurses with IPs were more successful with their transition from student nurses to professional nurses.
2. The absence of TSPs led to OR nurses new to the profession or working environment struggling to perform their job roles.
3. OR nurses new to an OR unit but with previous experiences in other OR units transition better than new graduate nurses who newly join the department.
4. As a result of the lack of TSPs with OR nursing contents, OR nursing continues to be foreign within the nursing profession, and the turnover rate of nurses in OR unit continue to see a negative pattern.

It was essential that these assumptions were made clear as they directly impacted the researcher during the first year of transitioning from a student nurse to a professional OR nurse. Moreover, over the years of moving from one OR unit to another, these experiences became an assumption for what other OR nurses might have encountered. However, the researcher acknowledged that these assumptions were independently owned and that there was no prior knowledge of what other nurses encountered, as the researcher had little attention to the phenomenon prior to embarking on the research. Thus, having personal assumptions based on past knowledge and experience of the phenomenon was an acceptable life cycle of interest (Empson, 2021; Mertens, 2017).

Collection of Data

Ethical approval was not required because the study used convenience and snowball sampling, and participants were not directly recruited from hospitals. However, a gatekeeper letter (Appendix I) was forwarded to the gatekeepers to inform them of the research objectives and their role in assisting in the data collection. Snowball sampling occurred after the form was forwarded and their roles as gatekeepers were understood. Furthermore, participants' and organisations' names were excluded during the data collection to ensure confidentiality and anonymity. Where applicable, email addresses received for the qualitative phase of the study were protected. The data sources were obtained through the self-developed instrument tool developed by the researcher of the study. As mentioned in the earlier section of the chapter, all data sources underwent expert reviews and instrument pre-testing to ensure the reliability and validity of the instrument.

Next, the data collection process began a day after receiving ethical approval (see Appendix J). The first four weeks of the data collection process were focused on collecting the quantitative aspect of the study, while the last two weeks were focused on the qualitative aspect. The data collection process ended on May 20, 2022. As previously mentioned, data was collected through convenience and snowball sampling. This process occurred with the convenience of social media platforms such as WhatsApp, Instagram and Facebook web chat apps. The OR nurses who were approached were all clinicians with the Singapore OR nursing units. Although there was some resistance from some clinicians to forward the survey due to their lack of interest in the area of nursing research, the researcher acknowledged that there was no push to participate in the study.

Along with the gatekeeper letter, an online participant information sheet (Appendix K) was forwarded to the gatekeepers so that interested participants could read through the details of the objectives and purpose of the study. In the participant information sheet created

via Google Forms, nurses were advised that their participation was entirely voluntary, and even after agreeing to participate in the study, they could withdraw at any stage if they were not keen to continue. Therefore, their input would not be included in the study's results. Participants who continued participating in the study were required to fill out a few questions and click the link provided on the participant information sheet to begin the survey questionnaires via Google Forms. A summary of the participant information was provided in the earlier section of the survey under instructions, and participants could continue to begin the survey after the instructions were comprehended. The participants' anonymity in the quantitative survey was maintained as participants were not required to include their names or the organisation in which they were employed. However, except for participants who were interested in the qualitative phase of the study, their email addresses were required. Participants were later contacted via the email address they provided, and informed consent was forwarded to participants recruited for the qualitative phase of the study. These participants were ensured that their identity would remain anonymous and that their information, such as email addresses and personal views with regard to the study, would remain confidential.

Subsequently, with the convenience of Google Forms, the researcher could track whether sampling recruitment sizes were met by observing the '*Responses*' tab on the application. When this was considered insufficient, more gatekeepers were approached to ensure the targeted population was thoroughly reached. As mentioned earlier, participant recruitment was repeated, and when the main inclusion criteria were difficult to achieve, the broader population discussed earlier in the inclusion and exclusion criteria was employed. Responses for the quantitative survey were individually transferred from Google Forms to SPSS version 28.0.1 software. Conversely, data verbatim from the qualitative interview was transferred from audio recording and interview notes through Microsoft Word. Participants in

both study phases were informed about how data were stored and protected through the participant information sheet. Upon completing data collection, participants from the qualitative interview received an email of appreciation and gratitude for their involvement in the study. Gatekeepers were also reached via the respective platforms contacted with the same message.

In summary, this section has discussed the detailed process of the study procedure. It included understanding the research policy provided by the University and the forms required for the ethical boards to grant approval to begin the research. The researcher's assumptions of behaviour, beliefs and knowledge regarding the research topic were also discussed to ensure that any possible bias that could occur before commencing the study during data collection and analysis would be avoided. Lastly, a detailed discussion of the collection of data was discussed. The following section will discuss the ethical assurances undertaken for this study.

Data Collection and Analysis

This section will detail the steps undertaken for data collection and analysis. It would include a detailed description of the collected data, the processes and steps used in gathering it, how the data were coded, and the software used. The data collected aligned with the research questions (RQs) and hypotheses of the study, as the data collected provided the information needed to answer the RQs and hypotheses in Chapter 4. Lastly, triangulation methods will be discussed in detail for each area where triangulation was used.

Procedures for Data Collection

The generation of data for the study was facilitated through two methods. Firstly, an online survey questionnaire using closed-ended questions was employed to ask respondents to choose from a distinct set of pre-defined responses. The method was used to gather quantitative data from respondents. Next, an in-depth semi-structured interview using open-ended questions was designed to elicit an open dialogue with participants. As discussed in the

earlier sections and chapters in the study, the purpose of the open-ended semi-structured interview was to provide participants with the opportunity to personally give their opinions regarding the research phenomenon based on their lived experiences (Ball, 2011; Rutberg & Bouikidis, 2018).

Quantitative Data

As discussed, the data collection process began on April 8th 2022, when UREC granted ethical approval. Data were collected between April 8th 2022 and May 20th 2022. Quantitative data were collected first, and to proceed to collect qualitative data, the researcher required the email of participants interested in taking part in the narrative part of the study. Thus, the qualitative study's data collection process began on May 14th, 2022, and ended on May 20th, 2022. It meant that the final week of data collection was concurrent due to the dateline that the university provided.

To receive the necessary response rate and draw meaningful data, all participants who met the research inclusion criterion, read the participant information sheet and were willing to complete the quantitative survey questionnaire were utilised. The process included using the convenience sampling method by forwarding the online participant information sheet, which included the link to the questionnaire, to the gatekeepers to forward it to colleagues who met the inclusion criteria. Gatekeepers were informed through the gatekeeper's letter about the research objectives and their role in assisting in the data collection. Snowball sampling began once gatekeepers forwarded the online participant information sheet via the Google Forms link, and participants forwarded it to their colleagues who met the demographics of the inclusion criteria. It included participants who had joined their OR unit for less than three years regardless of years of nursing experience, gender, and nursing qualifications. As mentioned earlier, the process occurred between April 8th 2022 and May 20th 2022. Participation was anonymous, and privacy was upheld for those who provided

their email addresses. Data collection was halted after the deadline was due, and 96 responses were collected. The data was then secured and prepared for analysis.

The researcher ensured that the data collected aligned with the study's research RQs and hypotheses to provide the information needed to answer the RQs and hypotheses. The process included instrument self-development rationalised in detail in the earlier sections. Within the self-developed instrument tool, the survey introduction collected data such as nurses' job roles, years in their current OR unit, availability of TSPs, and after the extent to which participants responded, a pre-defined response was asked in alignment to glean information needed to answer the RQs and hypotheses. The survey included nine write-in items, of which only six were mandatory fields and 35 multiple-choice questions.

Qualitative Data

Next, qualitative interview sessions began upon receiving the returned survey questionnaires via Google Forms. Information regarding interested participants was available from the '*Responses*' tab. The researcher forwarded a formal invitation to participate in the qualitative interview session via the email addresses provided. For participants who replied, a date was set, and a meeting time was established at the participant's convenience. All interviews were conducted using the same video conferencing platform, Zoom. The interviews were conducted in both parties' quiet, private personal rooms. Before the interview sessions, each participant forwarded and signed the informed consent form (Appendix L).

During each interview session, all participants were asked the same questions based on the self-developed qualitative manual script (Appendix H) prepared by the researcher, which could adjust the sequence of the questions based on participants' responses.

Additionally, when the opportunity to elaborate allowed the dialogue to be extended, the researcher facilitated this (Alase, 2017). The questions in the qualitative manual script were designed to maintain focus on the study's phenomenon (Alase, 2017; Creswell, 2014;

Neuman, 2013). Strong rapport was established between the researcher and the participants and was an essential aspect of allowing openness and honesty when answering questions and reducing bias (Adams et al., 2014). It included getting to know a brief background of the participants and using appropriate questioning techniques, such as explanatory probing, to motivate participants to elaborate on their responses (Adams et al., 2014). The total duration of each interview was between 30 and 40 minutes, with the entire qualitative interview process spanning over four weeks from the day of first participant recruitment until the deadline for the data collection. Regardless of the time for each interview session, the transcripts of each session were about the same. The varied durations were due to the time taken for some participants to present a response.

All interviews were voice tape-recorded instead of Zoom recording to ensure that participants' anonymity and confidentiality could be maintained and maximised as the options lend themselves. As mentioned, interviews were the best way to gain detailed, rich insights into participants' experiences and opinions. All voice records were stored and saved with a secure password using the researcher's voice recording app via iPhone. Following each interview session, the researcher transcribed verbatims as soon as possible through Microsoft Word. Each transcript was precisely transcribed as per the voice recording and checked for accuracy by conducting a second round of listening before analysis. Each transcript was identified by coding number, for example, P1. Each participant's code number was established based on the interview order. All data were secured with a password in a folder only the researcher could access. For a more precise understanding, the researcher edited grammatical errors after verifying the transcripts, and all voice recordings were later deleted. Additional participants were not recruited after eight interviews because data saturation had been met, meaning no new information could be obtained with more interviews.

Procedures for Data Analysis

Quantitative Data

Data analysis for the quantitative research was completed using SPSS Statistics version 28.0.1. In order to understand the impacts of OR nursing IPs on perioperative nurses, the statistical analysis used included descriptive analysis, measures of central tendency, regression analyses, Independent T-test and Spearman's correlation. In addition, each returned survey received via Google Form was reviewed for completeness, and only responses that met the inclusion criteria were included in the data analysis. These tests were also in line with answering the study's research questions and hypotheses outlined in Chapter 1.

Descriptive data were first analysed for the socio-demographic variables. These included frequencies and percentages to outline participants' age, gender, years in their current OR unit, years the organisation have been in operation, job title, job role, years since graduating from nursing school and highest nursing qualification. Percentages and frequencies were also used to measure whether participants received the different IPs and lengths of IPs and other items in the IORNTSP survey that had no scale of measurements. The purpose of analysing these data was to examine the relationship among each variable.

Next, measures of central tendencies, including mean, median, mode, percentage and standard deviation, were used to measure the level of impact OR nurses have with IPs. These were measured using Likert-scaled questions in the IORNTSP survey questionnaires. The scale of impacts measured in the study included the operational variables discussed earlier, namely causes, types, effects and behaviour presentations. Later, an Independent T-test was done to determine any statistical difference between the different groups of OR nurses (independent variables) when receiving an OR IP (dependent variable). It was done to help answer the research questions stated earlier. The different groups of nurses were grouped

according to either, for example, job title, job role or nursing education level. Lastly, Spearman's correlation analysis was performed to examine the presence and strength of relationships among perceived causes, types, effects and behaviour presentations that the impacts of OR unit-specified IP had on OR nurses using the quantitative self-developed instrument tool.

After the quantitative data analysis was completed, results were compared with the extant literature to check for data reliability. Also, results from the quantitative study were used to discuss the connection of the study with Benner's '*From Novice to Expert*' theory and the '*Conceptual Model of Nursing Motivation*' by Warren and Mills that was discussed in Chapter 1.

Qualitative Data

After completing the quantitative data analysis, the researcher proceeded with the study's qualitative research data analysis. The thematic analysis technique was used to explore the earlier research questions and examine the relationship to how NJNs in the OR perceived their impacts after undergoing their respective IPs. The purpose of thematic analysis was to explore a data set and extract repeated themes (Kiger & Varpio, 2020; Nowell et al., 2017). Braun and Clarke's (2014) six-step thematic analysis was used better to guide the researcher during the thematic analysis procedure. The six steps included the following: familiarising oneself with the data, coding the data, searching for themes, reviewing the themes, defining and renaming the themes, and producing the report (Braun & Clarke, 2014; Kiger & Varpio, 2020).

Step one involved familiarising oneself with the data. It was described as a step in which a researcher begins to familiarise oneself with their data set by actively and repeatedly reading through the data collected (Braun & Clarke, 2014; Kiger & Varpio, 2020). It could also include listening and watching through media collected depending on the data collection

tool of the study (Kiger & Varpio, 2020; Nowell et al., 2017). However, it was not the stage where the researcher starts immediately coding and extracting themes (Kiger & Varpio, 2020). For example, in the study, the researcher initially transferred data verbatim of the qualitative interview from audio recording to Microsoft Word Version 16.61 and listened to and referenced each transfer document twice.

Next, step two involved coding data. By reading and re-reading the transcribed verbatim, the researcher identified words and common phrases (codes) that resembled an idea with the research questions. However, locating themes was not part of the step (Kiger & Varpio, 2020). The researcher also coded each question according to the responses representing a relationship to answer the research questions. The researcher ensured that the codes identified did not overlap and were sufficiently well-defined. The step was vital as Nowell et al. (2017) suggested that by recording how codes developed, the process of trustworthiness of a study's interpretations and analysis would be embarked upon. Upon completing data coding, the researcher would apply the exact codes to the actual data set before studying for any potential patterns or relationships between items that might convey subsequent theme development (Braun & Clarke, 2006) in preparation for step three.

Step three involved searching for themes and sorting them into subthemes (Braun & Clarke, 2014; Kiger & Varpio, 2020). To ensure that developing themes were supported, each participant's responses were coded in the earlier step, and the recorded documents were taken and matched. Also, a deductive analysis approach was undertaken as the study had already predefined a theory and conceptual framework. Thus, themes were focused on a particular aspect of the data set or a direct question of interest (Braun & Clarke, 2006). However, as the literature pointed out, the researcher should note all or any themes of possible significance regardless of whether they explicitly relate to the research question, as no limit exists on the number of themes that should be considered (Kiger & Varpio, 2020). It was because valuable

themes would provide meaningful links between data items and answer essential aspects of research questions (Kiger & Varpio, 2020). Thus, regardless of the focused themes and others that emerged after analysis in the study, they would not be discarded until they had been reviewed in step four.

In step four of reviewing themes, the researcher identified codes from different areas of the transcripts and incorporated themes and their sub-themes (Kiger & Varpio, 2020). The researcher achieved this step by revising and refining themes to ensure each identified theme reflected its relationship with the data. For example, when the researcher asked, “In your opinion, were there any gaps in the OR unit induction programme you underwent?” multiple responses were received, which helped develop the theme “Quality of IP”. Next, the steps were repeated on other data extracted and relevant codes. Finally, the researcher reviewed the themes based on two criteria. Firstly, did each theme have sufficient supporting data that was coherent and viable to support the theme? Secondly, were the themes significantly different from each other? (Braun & Clarke, 2006; Kiger & Varpio, 2020).

Following step four, in step five of defining and naming themes, the literature stated that the researcher would create a definition and narrative description of each theme after the thematic map has been refined from step four (Braun & Clarke, 2006; Kiger & Varpio, 2020). The researcher in the study considered three critical factors for this step. Firstly, to ensure each identified theme was relevant to the research questions; secondly, how data was supported by the theory and conceptual framework identified in the study; and thirdly, to consider any relationships among the themes identified. Step five was tedious because it involved the researcher ensuring that the final themes identified were clear and distinct to represent the data set.

The final step of Braun and Clarke’s (2014) six-step thematic analysis involved the researcher producing the report. It will be presented in Chapter 4 of this study, which will

include a descriptive explanation of the findings and why the selection of the themes was important (Braun & Clarke, 2006). In addition, it would consist of tables and quotes from participants' responses and a summary of the main codes, themes and sub-themes, referencing support from the extant literature and results from the quantitative study that would enhance the discussion of the result findings to provide an argument to answer the research questions and hypotheses fully. Additionally, data triangulation was achieved by using heterogeneous data sources to strengthen the research findings (Wilson, 2014; Noble & Heale, 2019).

Summary

Chapter 3 outlined the details of this mixed methods study exploring the impacts of nursing IPs on NJNs in Singapore OR units. Firstly, the chapter initiated a synopsis of the journey of the study thus far by restating the research problem and purpose, as discussed in Chapter 1. It allowed the author to emphasise the need for the study due to the limited exploration of the phenomenon within the Singapore OR nursing context. When exploring the extant literature, it was noted that theory-practice gaps (Cheng et al., 2014; Hung et al., 2018; Ortiz, 2016), poor support systems (Beitz, 2019; Freeling et al., 2017; Smith et al., 2015), and insufficient length of OR IPs (Baldwin, 2016; Kowalski & Cross, 2010; Chappy et al., 2016; Maxwell, 2011; Rush et al., 2013; Vortman & McPherson, 2021) were among the themes to have impacted OR NJNs with their scope of practice. It later led these groups of nurses to suffer early burnout (Chard, 2010; Del Grosso & Boyd, 2019; Vander Elst et al., 2016) and transition to practice challenges (Foran, 2015; Elley, 2016; Vortman & McPherson, 2021). Moreover, health pandemics like SARS-CoV-2 further extend the gaps of missing OR nursing learning opportunities and exposure. Thus, after reviewing the literature, the study aimed to address the impacts of the extant literature and identify and address those that the study would discover.

Secondly, the chapter described the study's research approach and design and substantiated the appropriateness of the methods and designs. The author concluded that the explanatory sequential mixed methods design was most appropriate to explore and explain the impacts current IPs received had on NJNs in Singapore OR units. It was because the design would be able to meticulously comprehend and recount the trends of impacts recent IPs received have on NJNs in Singapore OR units and the individual perspective of these nurses based on their experiences, as it involved the collection and analysis of quantitative data first, followed by collecting qualitative data to explain the quantitative data (Almedia, 2018; Creswell, 2014; Schoonenboom & Burje Johnson, 2017; Shorten & Smith, 2017). The author's consideration to adopt the research design was supported by the extant literature that used the same research design to explore similar phenomena (Lamont et al., 2014; Morton et al., 2011; Nowell et al., 2017). The author also argued that although there were broad availabilities of choices of mixed-methods research methodologies, the approaches of those designs did not meet the aim of how the research was desired to be administered.

Next, the author discussed the design steps, including the reasoning for adopting a cohort survey design for this study. Based on previous studies that have adopted the design, it was observed that, firstly, cohort studies would allow researchers to obtain data regarding an event that had already occurred and look ahead to understand what could be done to prevent future detrimental effects of the problem (Guaraldi et al., 2020; Liao et al., 2020; Taquet et al., 2021). On the other hand, questionnaires or structured interviews (Creswell, 2014; Yilmaz, 2013) and survey design studies provided researchers with statistical data on the participants' views regarding a phenomenon (Creswell, 2014). The author shared that although other study designs were available for both quantitative and qualitative designs, they were justified as inappropriate for exploring the research topic. This was because some designs were bound by the activity and time of the case (Creswell, 2014). However, in

relation to this study, the event had already occurred. Also, the experimental design was considered irrelevant to this research as this author did not seek to examine if a specific treatment influenced the outcome of a treatment plan (Creswell, 2014).

Thirdly, the author described the population, estimated sample size, sampling method and relevant characteristics. The author outlined in the discussion presentation that the study would recruit nurses who had newly joined the OR unit in a public hospital group in Singapore. It included nurses working in all OR unit areas, such as the reception and admission area, anaesthetic, operating room and recovery room. The nurses working in those areas included admission, anaesthetic nurses, PACU and scrub and scout nurses (Rothrock, 2019). The definition of each nurse's role was also presented to provide a better overview of the job scope. In addition to the discussion, the author outlined the study's inclusion and exclusion criteria to bring awareness about the target population.

Fourthly, three sampling methods selected for the study were discussed. It included convenience, purposive and snowball sampling. The sampling methods were chosen based on each method's characteristics and suitability, mainly due to the challenges faced in reaching the targeted population due to the change in research focus within Singapore OR nursing during the SAR-CoV-2 pandemic. The author also pointed out how recent researchers have adopted similar sampling methods during the pandemic as issues with logistics concerning participant accessibility (Al-Mohaithef & Padhi, 2020; Doshi et al., 2020). Additionally, cost and time efficiency sustained the author's reason for adopting the sampling methods (Etikan & Babatope, 2019). The authors also considered avoiding sampling error and bias by ensuring that the study would take extra effort to approach parties meeting the inclusion criteria.

The author later presented how Taro Yamane's (1967) formula $n = N / [1 + N (e)^2]$ helped derive the sample size of 114 that were to be recruited for the study. The author

shared that the sample size was based on the estimated intake of NJNs into Singapore public hospitals OR units yearly. Additionally, the author shared that eight participants from the quantitative study were to be selected for the qualitative aspect of the study. The author also shared the possibility of recruiting more participants until data saturation was achieved.

Fifthly, the author discussed the construct and measures of the study. Theses included:

1. The construct the study would measure was '*impacts*'.
2. The measures to measure the study's construct (coding scheme) would include causes, types, effects, and behaviour presentation that have led to the impacts Singapore OR nurses faced with their IP.
3. To identify threats to the internal validity instrument, the construct measures were pre-tested through a pre-test survey study by administering it to a small sample group of the targeted population.

These steps were to ensure that questionnaires were tested for validity and reliability (Adams et al., 2014; Jones et al., 2013). Additionally, expert reviewers were done to identify threats to the internal validity instrument and ensured that the quantitative survey inputted the right questions, which helped ensure the validity and reliability of the instrument (Ikart, 2019).

This was followed by the author discussing the use of *The MEASURE Approach* developed by Kalkbrenner (2021) for instrument development. The approach was adopted to aid the author with developing the study's self-developed instrument, named the IORNTSP survey because it has proven to significantly help graduate students who have trouble accessing databases or textbooks due to the requirement for product purchase or organisation affiliation to gain access (Kalkbrenner, 2021). The seven steps that were discussed included i) making the purpose and rationale clear, ii) establishing an empirical

framework, iii) articulating a theoretical blueprint, iv) synthesise content and scale development, v) using expert reviewers, vi) recruiting participants, and vii) evaluate validity and reliability (Kalkbrenner, 2021).

Next, the author discussed the operational definition of variables for the study. These included Perioperative Nurses, IPs, Types of Causes, Types, Effects and Behaviour Presentation. The author also labelled the variables based on controlled, independent and dependent variables. Each of the primary constructs discussed was associated with the research questions and hypotheses, and each operational definition of variables was validated based on existing literature.

Later, the author discussed the study procedures and ethical assurances undertaken for the study. Firstly, the author shared the initial mandatory procedure before collecting data in the field. It involved obtaining ethical approval from the Unicaf University UREC. Before approaching the research ethics board from Unicaf University UREC, the researcher familiarised himself with the Unicaf University research policy and filled out the required documents. The researcher proceeded to collect data after three months of deliberation from the research committee, with ethical approval to proceed with the study on the 8th of April 2022. The author shared that a diary was maintained before collecting data to ensure a thoughtful review to prevent any possible bias before commencing the study during data collection and analysis. It included detailing personal assumptions, beliefs and personal views throughout the study. However, the author acknowledges that those assumptions were independently owned and that there was no prior knowledge of what other nurses encountered before embarking on this research. Thus, as the extant literature has shared, having personal assumptions based on past knowledge and experience of the phenomenon was an acceptable life cycle of interest (Empson, 2021; Mertens, 2017).

Issues such as confidentiality and anonymity were discussed. It included outlining the participant's involvement in the research through the online participant information sheet and gaining informed consent before the face-to-face online interview. The researcher also included a gatekeeper's letter to gain permission from gatekeepers for participant recruitment. Additionally, based on the UREC advice, information such as names and initials might lead to breaching confidentiality and anonymity was excluded. However, except for participants who were keen to participate in the qualitative aspect of the study, the email addresses provided could only be seen by the researcher and kept under a saved folder.

Lastly, the author discussed a detailed description of the collected data, the processes and steps used in gathering the data, how the data would be coded, and the software used. Firstly, the author shared the two methods data were collected for the study, namely through an online survey questionnaire using closed-ended questions designed to ask respondents to choose from a distinct set of pre-defined responses, which used a 5-Likert scale or nominal scale. Secondly, an in-depth semi-structured interview using open-ended questions was administered through Zoom to elicit an open dialogue with participants for the qualitative study. The data collection process began on the 8th of April 2022 and continued through the 20th of May 2022. Data was then secured and prepared for analysis, and the researcher ensured that the data collected aligned with the study's research RQs and hypotheses to provide the information needed to answer the RQs and hypotheses. The researcher used two platforms for data analysis, namely SPSS Statistics version 28.0.1 for the quantitative study and six-step thematic analysis for the qualitative study for thematic analysis.

In conclusion, Chapter 3 presented an essential overview of the researcher conducting the study's data collection and analysis. It also helped the author give other aspects of the study to help readers and future researchers understand the operation terms. Additionally, it emphasised why the research was necessary to provide ground for a better future for

Singapore OR nursing professionals. The following sections of the study will discuss these research findings, implications, recommendations and the study's conclusion.

CHAPTER 4: FINDINGS

This explanatory sequential mixed-methods design study aimed to explore and explain how receiving nursing IPs in Singapore OR units has impacted the transition to practice and the ability to perform job roles among Singapore NJN OR nurses in their new clinical environment. As discussed in the earlier chapters, the purpose of the study's results would help nursing educators, management, and policymakers generate solutions to improve current TSPs in Singapore OR units and improve those gaps. Besides, recognising the impacts OR nursing IPs had on OR NJNs by addressing it through the findings in the study would help the nursing profession in Singapore to close gaps in issues contributing to the ongoing poor staff retention rates, thus improving the credibility of the OR nursing profession. The purpose of the study was brought to light because of gaps and issues highlighted in the literature pertaining specifically to the impacts of nursing IPs on NJNs in Singapore OR units and the lack of research within the Singapore context. Some of the main issues highlighted within the extant literature included theory-practice gaps, poor support systems and insufficient length of OR IPs. As highlighted in the vast literature, these issues have affected novice nurses working in areas like the OR unit, causing them to suffer early burnout and transition to practice. Also, the literature shared that nurses with experience in the OR unit who moved to a new OR unit shared their struggles with adapting to a new clinical environment due to language barriers, cultural differences among migrant nurses and conflicting practices between current and previous workplaces.

Additionally, with the stress of the recent health crisis, the OR units have continued to progress with their technologies to provide better patient care and improve the standards of professional practices despite the constant blockage and reduction of elective surgeries during the crisis. It signified that OR nurses had to progress and adapt continuously to these changes despite the ongoing crises. It also included constantly instilling the correct knowledge and

concept of perioperative nursing in nurses, especially those undergoing their TSPs.

Therefore, it was imperative and opportunistic for nursing management and educators in the OR profession to explore how to support current and future nurses in their role transition and daily work responsibilities in the OR unit once elective surgical services fully resume capacity before the recent pandemic. With the lack of empirical research regarding the phenomenon, particularly in Singapore, and in the face of global nursing shortages, it was imminent for the matter to be explored and understood for the well-being of patients and the nursing profession.

The following research questions and hypotheses guided the mixed methods study:

RQ1. To what extent did having an OR unit-specific specialised nursing IP enhance OR unit nurses' knowledge and skills in performing new job roles?

H1₀. Having an OR unit-specific specialised nursing IP would not result in the enhancement of OR NJNs in Singapore's knowledge and skills in performing their new job roles.

H1_a. Having an OR unit-specific specialised nursing IP would result in the enhancement of OR NJNs in Singapore's knowledge and skills in performing their new job roles.

RQ2. To what extent did the challenges NJNs in Singapore OR face with the OR unit-specific specialised nursing IP affect their ability to perform their roles?

H2₀. OR unit-specific specialised nursing IPs did not affect Singapore OR NJNs' challenges with their ability to perform their roles.

H2_a. OR unit-specific specialised nursing IPs affected the challenges Singapore OR NJNs faced with their ability to perform their roles.

In the remainder of this chapter, the author will discuss how the trustworthiness of the data was secured, specifically in areas such as credibility, transferability, dependability and

confirmability. Additionally, the author would present how the variable constructs established in the previous chapter met the assumptions of the statistical tests and identify any potential weaknesses in the interpretation or validity of the data collection and analysis. Next, the author will discuss the reliability and validity of the study's data. These would include the discussion of the validity of the measurement and test itself (internal validity), the ability to generalise the findings to the target population (external validity), and the overall consistency of the study's measurement instrument (reliability).

After discussing the reliability and validity of the study's data, the author will present an overview of the data collected and analysed results. It would include a systematic order of result presentation organised by research questions and hypotheses. It would be followed by the discussion of results by research methods, quantitative study followed by qualitative study. The discussions would follow the order of the research questions and hypotheses. It would include appropriate descriptive information, followed by answering the research questions and hypotheses as stated and relevant to the type of data collected, identify assumptions of statistical tests and address any violation of assumptions, make decisions based on the results of the statistical analysis and present sufficient information so the reader could make an independent judgment regarding interpretation for the quantitative analyses discussion. After discussing the qualitative analyses, the results would be presented logically to answer the research questions by distilling the steps of the discernment process and giving sufficient information for readers to judge the researcher's interpretation independently. Tables and figures will support the discussion of the analyses to provide an expansive vision of the results and findings.

Following the discussion of the results, the author will present the evaluation of the findings. In this section, the author will briefly report the significance of the findings. Research questions and hypotheses will organise the discussion, and the theory and

conceptual framework identified in the study's earlier discussion will be used to interpret the results. In addition, it will include a discussion on whether the results obtained were expected in conjunction with the literature, and potential explanations would be discussed for unexpected or conflicting results. Next, the author will summarise critical points in Chapter 4 as part of its summary.

To conclude the study, the author will present the final chapter of the study in Chapter 5. It would include a brief review of the problem statement, purpose, method, limitations and ethical dimensions. After this, the author would conclude the introduction with a brief chapter overview. Finally, it will discuss the study's implications, recommendations and conclusion. The discussion of the implications would be organised around each research question and hypothesis individually to draw logical conclusions. The actual research findings would support all conclusions discussed, and conclusions that were beyond the scope of the study results would be avoided.

Next, a discussion on how any potential limitations may have affected the interpretation of the results will be discussed based on how the results respond to the study problem, fit with the purpose, aligned with the conceptual framework, demonstrate significance, and contribute to the existing literature described in Chapter 2. Also, the discussion will be followed by describing whether the results were expected given the literature and providing potential explanations for unexpected or conflicting results. Lastly, the author will discuss the implications of practice for the nursing OR discipline and discuss, in the context of the literature review, how the study builds to the existing body of research on this topic for the doctoral degree.

In the following chapter, the author will discuss the recommendations for applications supported by the research findings and framed in the literature from Chapter 2. A discussion of recommendations for future study will follow. In the section, the author will reflect on why

the study was essential to initiate and ensure it demonstrates and reflects the depth and importance of the study. Lastly, the author will conclude with the take-home message of the entire dissertation study with a specific emphasis on the study's results and what the results mean concerning the theory, prior research and practice. It will refer to the results in context by describing how they respond to the study problem, demonstrate significance, and contribute to the existing literature and practice.

Trustworthiness of Data

Credibility, transferability, dependability, and conformability were incorporated throughout the study to ensure data collection, interpretation, and accurate reporting were maintained to ensure the trustworthiness of data was secured. It was a critical aspect to justify the rigour of the qualitative design of the study (NIH Office of Behavioral and Social Sciences, 2018). On the other hand, to ensure the trustworthiness of the quantitative study, the reliability of the questionnaire was tested through an internal consistency reliability test using Cronbach's alpha (Hedges, 2015a). Additionally, to further boost the trustworthiness of the quantitative aspect of the study, a validity test was maintained by examining whether the instrument tool (questionnaire survey) measured the content it was intended to measure (Hedges, 2015a) by performing an expert review (Ikart, 2019) with the aid of experts in the field of clinical nursing and academia. Validity tests that were administered included face validity to establish the content validity of the instrument tool and construct validity to develop the degree to which the instrument tool measures the construct (Hedges, 2015a).

Credibility

Various methods were used in the study to ensure its credibility. Ensuring credibility in a research study was to instil confidence in the truth of the research findings (Lincoln & Guba, 1985). Therefore, it would enhance readers' confidence in the research findings so they might use them in practice (Gerrish, 2015; Noble & Smith, 2015). The study's researcher

began ensuring credibility by adopting the appropriate sampling methods to facilitate data collection from the relevant population group that would provide rich and thick verbatim from participants (Noble & Smith, 2015; Onwuegbuzie & Collins, 2017). As discussed in Chapter 3, three sampling methods were deployed to recruit participants: convenience, purposive, and snowball. The study's author shared that the methods were chosen because of each method's characteristics and suitability at the stage when the research was undertaken. Besides, the sampling methods chosen were referenced from existing studies to ensure their appropriateness. The process needed to be undertaken because any data collected would subsequently lack credibility if an inappropriate sampling method were employed (Onwuegbuzie & Collins, 2017).

Next, as shared in Chapter 3, a survey pre-test and expert reviewers were undertaken to enhance the credibility of the instrument tools (Ikart, 2019; Ruel et al., 2016). Additionally, the researcher maintained a diary during the data collection process to ensure neutrality throughout the study, thus achieving audibility (Noble & Smith, 2015). Next, ensuring the compliance of protocol for data collection (Bailey, 2014) and member-checking (Brown & Sorrel, 2017; Noble & Smith, 2015) were established during the data collection process. It included commencing data collection only upon receiving ethical approval by Unicaf University UREC, as discussed in Chapter 3 and assuming that the participant provided an open and reflective response using an open-ended survey interview. The purpose of applying member-checking was essential to ensure the accuracy of data collection and interpretation by both the researcher and participants (Brown & Sorrel, 2017; Lincoln & Guba, 1985; Noble & Smith, 2015). It included debriefing with the participants after the last question from the survey was asked and after initial analysis was done to reach out to participants to clarify and provide feedback for some responses and interpretations.

Lastly, the triangulation of data findings was utilised to improve the study's credibility (Wilson, 2014; Noble & Heale, 2019). It included methods of triangulation. It had multiple methods of obtaining data, such as interviews and diaries as field notes, and theory triangulation, which included using existing theory to help interpret the data findings (Carter et al., 2014). Lastly, a comparison of findings from previous literature was performed to ensure consistency across the field associated with the phenomenon (Creswell, 2014; Creswell & Plano Clark, 2018).

Transferability

The literature described transferability as comparing readers' situations to the research findings (Lincoln & Guba, 1985; Noble & Smith, 2015). The transferability concept for the research study was first applied by constructing the instrument tools to align with existing literature, theories, and concepts. Secondly, as mentioned earlier in the paper, expert reviewers vetted the instrument tools to identify problems with questions constructed. They provided feedback to fine-tune questions that aided in collecting optimal measurements (Ruel et al., 2016). These methods were employed to boost the study's transferability and ensure validity when findings accurately measured the phenomenon (Noble & Smith, 2015).

The qualitative study drew the phenomenon, meaning and conclusion from rich and thick verbatim from Singapore OR NJNs. The application of thick description also helped determine the gravity of an event of the participants when they were allowed to speak openly, thus allowing for rich data to be achieved and the research process to be re-lived (Noble & Smith, 2015; Onwuegbuzie & Collins, 2017). Additionally, even if the results might have had a limit in their transferability to the outside of the nursing profession, the detailed description would allow it to be utilised in similar situations, contexts and circumstances (Lincoln & Guba, 1985; Onwuegbuzie & Collins, 2017; Scotland, 2012; Yilmaz, 2013).

Dependability

Dependability in research studies has been described as a process whereby the findings were consistent with the extant literature and could be repeated and reliable (Lincoln & Guba, 1985). Therefore, it was important for the researcher to ensure the study's dependability. Firstly, as mentioned earlier in the paper, the magnitude of the study was essential for the Singapore OR profession, as no existing study has explored the phenomenon in the country. Secondly, it would allow future nurses within the OR discipline to expand and replicate the study in a different time frame to explore whether the phenomenon's effects have changed or remained the same.

As discussed earlier, member-checking was adopted in the study to ensure that vague concepts and responses were clarified and validated (Anderson, 2017). It was also supported by the researcher's note-taking after each interview and reviewing the notes and responses to assess any vague responses or uncertainty. Thus, the process warranted quality control of the data collected (Onwuegbuzie & Collins, 2017; Patton, 2015). Also, as discussed in Chapter 3, mock interviews were done with some expert reviewers to enhance dependability. Lastly, the process of selecting, justifying, and applying research methods was also clearly explained earlier in this paper to ensure their effectiveness in answering the research questions and hypotheses (Yilmaz, 2013).

Confirmability

Confirmability in research studies has been described when neutrality was achieved (Lincoln & Guba, 1985; Noble & Smith, 2015). It would occur when the researcher has accepted that multiple realities exist and that personal bias and preconceived ideas were acknowledged and set aside (Lincoln & Guba, 1985; Noble & Smith, 2015). For example, in the study, the research design and methodology ensured that findings were the results of participant viewpoints rather than the researcher's philosophy. Also, the emphasis on

prolonged engagement with participants by administering an open-ended interview to elicit an open dialogue further strengthens the study as the researcher's objectivity has been neutralised, thus building the study's credibility.

Secondly, coding was used to outline keywords and concepts detected verbatim to justify confirmability further. As discussed in the section on thematic analysis procedure in Chapter 3, the purpose of coding was essential in the data analysis of a research study to ensure the trustworthiness of a study's analysis once embarked (Nowell et al., 2017). Furthermore, data coding would help build on themes that would provide meaningful links between data items and answer essential aspects of research questions (Kiger & Varpio, 2020). To further boost the confirmability, emerging themes were discussed in an open method so that assumptions could be challenged to reach a consensus (Noble & Smith, 2015). To establish this process, the researcher consulted with two research experts from different fields to engage in the process, thus boosting the study's confirmability.

Lastly, as mentioned extensively in this section, field notes (diary) and member-checking were employed after a preliminary analysis to confirm the information collected. These methods ensured that any misconceptions were verified, thus enriching the meaning of the data interpreted.

Statistical Test Assumptions

The researcher acknowledged that the study's construct measures discussed in the earlier chapter met the statistical test assumptions by differentiating data types into metric or nonmetric data (Verma & Abdel-Salam, 2019). It was achieved by adopting a handful of methods. For example, nonmetric data, such as nominal data measuring items such as qualification level and gender, use a nominal scale. In contrast, construct variables defined in Chapter 3, such as 'types' of impacts, used an ordinal Likert scale to measure its constructs. It allowed the appropriate measure of central tendency (Verma & Abdel-Salam, 2019). On the

other hand, metric data such as intervals and ratios that measured time scale, age and years worked in an organisation allowed the appropriate measure of central tendency such as mean if the distribution was symmetrical and median if the distribution was skewed (Verma & Abdel-Salam, 2019).

Additionally, as discussed in Chapter 3, the author adopted a few measures recommended by Kalkbrenner (2021) in '*The MEASURE Approach*' model to examine if the variables were classified correctly and appropriately in the study's self-developed instrument tools. Firstly, the quantitative survey was pre-tested through a pre-test survey study to identify threats to the internal validity instrument (Ruel et al., 2016). Furthermore, expert reviewers were done to identify threats to the internal validity instrument and ensured that quantitative surveys were inputting the right questions for each of the three measurable constructs, which helped ensure the instrument's validity and reliability, thus establishing face and content validity (Ikart, 2019). Next, the Exploratory Factor Analysis (EFA) was performed after confirming that the data were appropriate for factor analysis to evaluate the construct validity of the IORNTSP survey (Kalkbrenner, 2021). However, the test was unsuccessful as the sample size was inadequate to run the test for each construct. The requirement for an EFA to be valid was a 10 participant to 1 question ratio (Kalkbrenner, 2021; Tabachnick & Fidell, 2014) or, as some authors have suggested, 5:1 (Peixoto et al., 2022). The minimum sample size to measure the lowest participant-to-question ratio was 30. The pre-test survey only managed to gather 13 participants. Thus, the test was forgone. This limitation will be further discussed in Chapter 5. However, the EFA test was successfully conducted for the actual study itself as the participant-question ratio met the statistical assumption test (Kalkbrenner, 2021; Tabachnick & Fidell, 2014), and the reliability of the three measurable constructs in the IORNTSP survey was assessed using Cronbach's alpha to measure for internal consistency (Kalkbrenner, 2021).

Finally, as discussed in the previous paragraph, the author has reduced any potential weakness of interpretation by categorising the variables to the correct nonmetric or parametric data, consulting with expert reviewers, performing a survey pre-test and running the appropriate statistical test to group items correctly. Firstly, incorrect classification of variables for the proper statistical analysis may adversely affect the findings (Verma & Abdel-Salam, 2019). Secondly, by approaching experts to review the self-developed instrument tools, questions were checked for correctness in sentence structure, comprehension and depth (Ikart, 2019; Ruel et al., 2016). Lastly, as discussed earlier, performing a survey pre-test and mock interview for the open-ended survey with a similar population group helped strengthen the data collection and analysis validity.

Reliability and Validity of Data

Validity of Data

The literature has described data validity as an essential aspect of research studies as it relates to the quality of the research components (Creswell, 2014; Drost, 2011; Hedges, 2015b; Polit & Beck, 2020). Hedges (2015a) pointed out this was due to threats presenting a counter or providing an alternative explanation of results, which might lead to limitations of a research study. These threats have been described as internal and external validity threats (Creswell, 2014; Drost, 2011; Hedges, 2015b; Polit & Beck, 2020).

Internal validity threats exist when an independent variable other than the one selected for a study would interfere with the effect of the dependent variable (Hedges, 2015a). In non-experimental design, like this research study, the internal validity threat would exist due to potential bias created by the sampling method and research design threats (Creswell, 2014; Polit & Beck, 2020). Convenience sampling and a self-reported survey were adopted to increase the response rate (Creswell, 2014; Polit & Beck, 2020). Firstly, the study's sample population represents NGNs who met the inclusion criteria. Thus, this might

increase selected bias (Hedges, 2015a). However, the characteristics aside from the inclusion criteria were unknown, thus creating heterogeneous attributes of the sample population (Polit & Beck, 2020). A larger sample size would have increased the representativeness of Singapore OR nurses in the study and minimised the error. However, as discussed earlier in the paper, the focus of recent research had shifted to exploring issues related to recent pandemic issues, and the lack of nurses being posted to OR units or redeployed to other clinical settings created a roadblock for the research.

Moreover, NJNs who met the inclusion criteria might not have been willing to participate as they did not feel that the phenomenon impacted them. Secondly, on the contrary, NJNs who participated in the study might have provided socially desirable responses (Hussein et al., 2017) as the gatekeepers approached them, seniors in their unit, to participate in the study. Thus, creating response bias (Choy, 2014; Creswell, 2014). Response bias also increased with a Likert scale as it included options such as *strongly agree* to the far left or top. Thus, participants would likely agree with a statement regardless of their comprehension of the items. The literature described this phenomenon as acquiescence bias (Suárez-Alvarez et al., 2018; Vigil-Colet et al., 2020).

The author took a few measures to minimise the threats to internal validity. Firstly, as discussed earlier in the paper, the mixed-methods research design was adopted for the study. The benefit of using the explanatory mixed methods design was that it included a quantitative research approach, thus improving the generalisability of the study as it was a quality of quantitative research (Creswell, 2014). Moreover, as nursing was an inclusive spectrum profession involving various disciplines, the author foresaw the study's results could be generalised to other nursing settings outside the OR. Furthermore, generalisability in quantitative research helped reduce threats to external validity (Almeida, 2018). The literature described this as the Hawthorne effect (Hedges, 2015a). It involved a change in

response or behaviour by a participant when they were made aware that they were observed performing a particular task (Hedges, 2015a). In the study, the issue was reduced. Despite being approached by their respective gatekeepers, their involvement in the study remained anonymous, as did their responses. Furthermore, the researcher used Taro Yamane (1967) to estimate the sample size with a level of significance set at 0.05 to ensure that threats to external validity were minimised (Polit & Beck, 2020).

Moreover, using a self-reported survey meant that the principal investigator had limited to no contact with the participants during the data collection phase of the study (Creswell, 2014). Hence, with such arguments, the results obtained were deemed credible as the responses were not manipulated based on response bias. Secondly, at the end of the discussion of the study's results, triangulation occurred as quantitative and qualitative studies were compared. The quantitative results provided patterns to the phenomenon, while the qualitative results reflected individual experiences regarding the phenomenon, thus increasing the study's validity (Bowen et al., 2017). The reliability of the three measurable construct variables was calculated separately for the IORNTSP survey. Two different tests were undertaken to ensure the reliability of the instrument tool in measuring the construct developed. It included an internal consistency reliability test and a test/retest reliability test (Hedges, 2015b).

Next, as discussed earlier in the chapter, validity tests included face validity to establish the content validity of the instrument tool and construct validity to establish the degree to which the instrument tool measured the construct was administered (Hedges, 2015b). It was done through expert reviewers. The researcher's methods helped boost the transferability of the study's self-develop instrument tool, which also ensured that validity was established when findings accurately measured the phenomenon (Noble & Smith, 2015).

Internal Consistency Test

As discussed, the IORNTSP survey was a pre-test with 13 Singapore OR nurses with different years of experience and who had undergone a perioperative room nursing IP. The objective of a survey pre-test was to detect question errors, comprehension of questions and reliability of questions using the Cronbach test. All 33 items passed the reliability test, with Cronbach's alpha values ranging from $\alpha = 0.764 - 0.881$, which was a statically acceptable level as it was higher than 0.7 (DeVellis, 2017; Kalkbrenner & Gormley, 2020). The 33 items were evaluated by each of the 13 mock participants using a 5-point Likert scale, with the exception of one item that was measured with a non-Likert ordinal scale. Similarly, the actual study drew similar Cronbach's Alpha values ranging from $\alpha = 0.739-0.806$ for initial reliability testing. It involved the evaluation of 91 participants. However, Cronbach's Alpha value for *the 'Effects'* construct was relatively low, drawing $\alpha = 0.196$, which was unacceptable (DeVellis, 2017; Kalkbrenner & Gormley, 2020). Thus signifying an error in the coding and grouping of items. Therefore, the researcher combined the variables to explore the construct relationships and coding correctness. A Cronbach's alpha value of $\alpha = 0.776$ was drawn by combining the '*Types*' and '*Effects*' variables, signifying that these variables should be grouped as it was measuring the same concept. It was similarly done for the survey pre-test, which drew Cronbach's alpha values of $\alpha = 0.718$, which was still statistically acceptable. Table 10 below illustrates the reliability test output for the survey pre-test and actual study.

Table 10*Cronbach's Alpha for each Subscale of the IORNTSP Survey*

Subscale	#Items	α
<i>Survey pre-test initial analysis</i>		
Behaviour Presentation	8	.88
Types	9	.81
Effects	3	.76
<i>Survey pre-test analysis after variables re-grouping</i>		
Behaviour Presentation	8	.88
Effects and Types	12	.72
<i>Actual study initial analysis</i>		
Behaviour Presentation	8	.81
Types	9	.74
Effects	3	.19
<i>Actual study analysis after variables re-grouping</i>		
Behaviour Presentation	8	.81
Effects and Types	12	.78

The analyses suggested that if some items were removed, Cronbach's alpha value would improve. However, it was not a significant increase in value; thus, the researcher concluded with the item groupings.

For the actual study, an EFA was performed for both scales in the IORNTSP survey. KMO values of .79 and .76 were drawn for the factor analysis, respectively. The '*Behaviour Presentation*' drew two factors, and reliability tests using Cronbach's alpha were run after the

findings of the EFA. Factor 1 drew α of .96 while factor 2 drew α of .72, which concluded that both values were acceptable levels statistically. Conversely, the EFA for *effects* and *types* scale drew three factors. However, item 29 in the questionnaire did not draw any value, signifying no relationship with the subgroup of types and effects. The communalities value of .123 confirmed this assumption.

Moreover, only two of the three factors managed only two items in each factor group, which was not sufficient to run a reliability test as the test required a minimum of three items to be valid (Rammstedt & Beierlein, 2014); thus, the EFA for the '*Effects*' and '*Types*' subgroups were abandoned, resulting in the internal construct validity being unable to be confirmed. It further justified the existing literature's assumption and rule of thumb that, ideally, the 10:1 ratio was required to run an EFA. Thus, despite the inability to run an EFA for the '*Effects*' and '*Types*' subgroups, the reliability test performed before the EFA was sufficient to evaluate items for their internal consistency.

Results

Data Collection Results and Responses

A total of 96 online surveys were completed, accessed via Google and completed through Google Forms. Of the 96 that completed the online survey, 91 surveys were deemed eligible as they met the inclusion criteria. The five ineligible surveys were OR nurses; however, they did not meet one of the main inclusion criteria of being in a new OR unit for less than three years. Of the 96 participants who completed the survey, 13 provided their emails to continue providing insights for the study through the qualitative interview study. Of the 13, nine participants said they wanted to participate in the study. However, only eight participants met the inclusion criteria. Although the researcher noted that data saturation was reached after five interviews, the last three participants keen to share their experiences were

invited to be interviewed to explore if new data could be analysed. Thus, the final samples for the quantitative study were $N = 91$ and $N = 8$ for the qualitative study.

Description of Demographic Data of Final Quantitative Study Sample

The samples of the 91 completed online surveys included nurses who were registered under the SNB as either ENs or RNs and were in their current OR unit for less than three years. Of the 91 samples, 35.2% ($n = 32$) were males and, 64.8% ($n = 59$) were females, and the largest group of respondents were aged between 20 – 23 years old ($n = 52$), followed by 24 ($n = 6$) and 28 ($n = 6$) years old. The typical years worked in their current OR unit were one year (18.7%) and two years (13.2%). Of the 91 samples, 75.3% ($n = 75$) had worked in their current OR unit for less than two years. The years the hospital was in operation were an estimation by the participants. The majority of the respondent responded that their hospital had been in operation for seven years (27.5%), 100 years (26.4%) and 200 years (23.1%). Most respondents have attained a diploma in nursing (56%). The next majority of respondents achieved a bachelor's degree in nursing (23.1%), and a minority of respondents attained a master's in nursing or equivalent (5.5%). The typical job rank of the respondents were RNs 84.6%, and the majority of respondents' job role was scrub and scout nurses (50.5%). Table 11 provides detailed demographics of the respondents. All participants had the liberty to input their relationship to the variable based on the options provided in the question; also, participants had the liberty to input qualitative data on some open-ended questions in the survey.

Table 11*Demographics of Quantitative Survey Participants*

Demographic / Data Types	<i>f</i>	%	Cumulative %
Q1. Age			
19 – 25 years old	62	68.1	68.1
26 – 30 years old	17	18.7	86.8
31 – 40 years old	12	13.2	100
41 – 45 years old	0	0	100
Q2. Gender			
Male	32	35.2	32.5
Female	59	64.8	100
Others	0	0	100
Q3. Years graduated from school			
Less than a year	27	29.7	29.7
Less than two years	37	40.7	70.3
Less than three years	15	16.5	86.8
More than three years	12	13.2	100
Q4. Years worked in current OR unit			
0 months to 11 months	31	35.2	31.9
1 year to 1 year 11 months	44	40.1	75.3
2 years to 3 years	16	24.7	100

Note N = 91, f = Frequency

Continued Table 11*Demographics of Quantitative Survey Participants*

Demographic / Data Types	<i>f</i>	%	Cumulative %
Q5. Years hospital had been in operation			
1 years to 50 years	35	38.4	38.4
51 years to 100 years	28	30.8	69.2
101 years – 200 years	21	23.1	92.3
Q6. Highest nursing qualification			
Nitec in Nursing	14	15.4	15.4
Diploma in Nursing	51	56.0	71.4
Bachelor Degree in Nursing	21	23.1	94.5
Master Degree in Nursing or equivalent	5	5.5	100
PhD in Nursing or equivalent	0	0	100
Q7. Job rank			
Enrolled nurse (EN)	14	15.4	15.4
Registered nurse (RN)	77	84.6	100
Q8. Job role			
Admission Nurse	7	7.7	7.7
Anaesthetic Nurse	17	18.7	26.4
Post Anaesthesia Care Unit (PACU) Nurse	21	23.1	49.5
Scrub and Scout Nurse	46	50.5	100
PhD in Nursing or equivalent	0	0	100

Note N = 91, f = Frequency

Continued Table 11*Demographics of Quantitative Survey Participants*

Demographic / Data Types	<i>f</i>	%	Cumulative %
Q9. Received orientation programme (OP)?			
Yes	90	98.9	98.9
No	1	1.1	100
Q10. Facilitator for OP			
OR Nurse Manager	7	7.7	7.7
Senior OR Nurse (Non-management)	7	7.7	15.4
A nurse educator / clinical instructor	77	84.6	100
Q11. Was personally introduced to colleagues?			
Yes	85	93.4	93.4
No	6	6.6	100
Q12. Length of OP			
One full shift (8 hours)	21	23.1	23.1
Half a full shift (4 hours)	3	3.3	26.4
Less than half a shift	7	7.7	34.1
More than one full shift	59	64.8	98.9
Not applicable	1	1.1	100

Note N = 91, f = Frequency

Continued Table 11*Demographics of Quantitative Survey Participants*

Demographic / Data Types	<i>f</i>	%	Cumulative %
Q22. Length of IP			
Less than a week	7	7.7	7.7
1 – 2 weeks	42	46.2	53.8
3 – 4 weeks	36	39.6	93.4
More than 4 weeks	6	6.6	100
Q23. IP facilitator			
Nurse educator specialised in OR unit	68	74.7	74.7
Specialised trained nurse in the OR unit (a nurse who possess an Advance Diploma in Perioperative or Peri-anaesthesia Nursing)	14	15.4	90.1
Senior nurse who has worked in the OR unit without any post-basic certificate in OR nursing.	5	5.5	95.6
Others	4	4.4	100
Q24. Was the facilitator insightful?			
Yes	90	98.9	98.9
No	1	1.1	100

Note N = 91, f = Frequency

Continued Table 11*Demographics of Quantitative Survey Participants*

Demographic / Data Types	<i>f</i>	%	Cumulative %
Q25. Were you assessed on your skills and knowledge during IP?			
Yes	86	94.5	94.5
No	5	5.5	100
Q42. Overall rating of IP			
Excellent	2	2.2	2.2
Very Good	29	31.9	34.1
Satisfactory	46	50.5	84.6
Needs improvement	14	15.4	100
Q43. Would you recommend your IP?			
Yes	81	89.0	89.0
No	10	11.0	100

Note N = 91, f = Frequency

Aside from the general demographics of study participants, Table 11 highlighted the diverse activities involved for OR NJNs in Singapore with the TSPs. Most respondents received an IP (98.9%); consecutively, 93.4% ($n = 85$) received a specialised nursing IP. Respondents typically underwent their OP for more than one complete shift (64.8%) and 1 – 2 weeks of IP (46.2%). Commonly, respondents reported that a nurse educator facilitated their OP (84.6%). Similarly, a nurse educator specialised in the OR unit was noted to facilitate the specialised IP (74.7%). 98.9% of respondents reported that their facilitators were mainly insightful and were generally assessed on their skills and knowledge during their IP (94.5%). Generally, the IP held was designed to be specific to the job roles of nurses in the

OR (92.3%) and mainly covered all job roles of OR nurses (86.8%). 93.4% of nurses reported having been personally introduced to their colleagues. Overall, respondents reported being satisfied with the overall delivery of the OP they underwent (86.8%). In contrast, 50.5% of respondents reported their IP as satisfactory, and 31.9% reported their IP as very good. In all, 89% of respondents would recommend the IP that they underwent to future NJNs.

Instrument Reliability

Internal consistency was measured using Cronbach's alpha. As discussed earlier, instrument constructs in the IORNTSP survey were measured separately. After regrouping the constructs with the aid of an EFA, construct variables, signifying that these variables of 'Effects' and 'Types' drew an $\alpha = .78$. It was similarly done for the survey pre-test, which drew a Cronbach's alpha values of $\alpha = .72$ which symbolised the instrument was statistically within an acceptable level. Similarly, the variables measuring the 'Behavioural Presentation' construct drew $\alpha = .81$ in the actual study and $\alpha = .88$, well above the minimum standard suggested by most researchers. A review of the reliability output showed that removing any of the items within the respective subgroups would not improve the α values, thus not improving the reliability of the questionnaires.

Findings

Quantitative Study

To address RQ1 and RQ2, measures of central tendencies were measured for each of the items in the behaviour presentation and effects and types in the IORNTSP survey. It included mean, median, frequency, percentage and standard deviation to measure the impacts OR nursing IPs had on Singapore OR NJNs. These were calculated using Likert-scaled questions in the IORNTSP survey. An Independent T-test test was performed to compare the effect specialised OR IPs had on two different groups of NJNs to address RQ1. Lastly, to

further explore RQ1, Spearman's rank-order correlation coefficient was computed to examine the relationship between two variables after undergoing their specialised IPs.

Furthermore, regression analyses were executed to explore relationships between the predictor variables and their impacts on OR NJNs' ability to perform their job roles. Before conducting the regression analyses, the assumptions required to explore the relationship between each predictor variable and the impacts of OR nursing IP on OR NJNs' ability to perform their job roles were met. The scatterplot of standardised predicted values versus standardised residuals showed that the data satisfied the assumptions of homogeneity of variance and linearity, and the residuals were approximately normally distributed.

Lastly, to address the hypotheses, the Spearman rank correlation coefficient test was executed to determine the strength of the relationship between selected variables and their statistical significance.

Research Question 1:

To what extent did having an OR unit-specific specialised nursing IP enhance OR unit nurses' knowledge and skills in performing new job roles?

To answer RQ1, each NJN responded to eight statements from the IORNTSP survey related to either behaviour presentation or effects and types. These statements were evaluated using a 5-point Likert scale for NJNs to respond. Seven of the eight statements were scaled and coded between "Strongly agree = 1", "Agree = 2", "Neutral = 3", "Disagree = 4", and "Strongly disagree = 5". Responses were coded accordingly in the data file except for "N.A.", which was assigned the value "0". It was added to the 5-point Likert scale to indicate that the response did not apply to the question as the participant did not experience the matter in the statement. The exceptional statement was scaled and similarly coded between "Strongly satisfied = 1", "Satisfied = 2", "Neutral = 3", "Dissatisfied = 4", "Strongly dissatisfied = 5", and "N.A. = 0".

The researcher acknowledged that, in general, only 1.1% of participants chose N.A. As mentioned, it was also important to note that the respondents were given the option to acknowledge that they did not experience the particular statement asked. The eight items on the IORNTSP survey could be identified as factors that might have affected the OR NJNs' knowledge and skills in performing new job roles through behaviour presentation (1 item), effects and types (7 items). Table 12 illustrates the percentages and frequency of NGNs who responded to N.A. for the eight items.

As discussed, each of the eight items evaluating the factors that might have affected the OR NJNs' knowledge and skills in performing new job roles were assigned "Strongly agree = 1", "Agree = 2", "Neutral = 3", "Disagree = 4", "Strongly disagree = 5" or "Strongly satisfied = 1", "Satisfied = 2", "Neutral = 3", "Dissatisfied = 4", "Strongly dissatisfied = 5". Table 13 illustrates the percentages of NGNs who responded to the eight items. Respondents who selected N.A. were excluded from the presentation.

Table 12

Frequencies and Percentages of Respondents Who Chose the Option “N.A.” for Statements Related to RQ1

QN / Statement	<i>f</i>	%
Q17. Satisfaction level of OP content coverage	1	1.1
Q27. Challenges faced after IP due to lack of technical skills exposure	0	0
Q29. Challenges putting theory and skills together after IP based on level of nursing	1	1.1
Q32. Challenges after IP as content was not sufficient to function in role	1	1.1
Q33. Faced challenges understanding concepts and seek clarification DURING IP	1	1.1
Q34. Faced challenges understanding concepts and seek clarification AFTER IP	2	2.2
Q36. Challenges faced to reach competence level during probation due to lack of resources	1	1.1
Q37. Challenges with confidence due to lack of skills and knowledge reached in IP	2	2.2

Note. N = 91

Table 13

Frequencies and Percentages of Factors that May Affect the OR NJNs' Knowledge and Skills in Performing New Job Role Related to RQ1 in the IORNTSP Survey

QN / Statement	1	2	3	4	5	Total %
Q17. Satisfaction level of OP content coverage	2.2	84.6	9.9	1.1	1.1	98.9
Q27. Challenges faced after IP due to lack of technical skills exposure	1.1	60.4	12.1	26.4	0	98.9
Q29. Challenges putting theory and skills together after IP based on level of nursing	1.1	34.1	7.7	51.6	4.4	98.9
Q32. Challenges after IP as content was not sufficient to function in role	4.4	59.3	12.1	20.9	2.2	98.9
Q33. Faced challenges understanding concepts and seek clarification DURING IP	1.1	50.5	12.1	35.2	0	98.9

Note. The percentage for each item did not reach a total of 100 as the option "N.A." was excluded; N = 91

Continued Table 13

*Frequencies and Percentages of Factors that May Affect the OR NJNs' Knowledge and Skills
in Performing New Job Role Related to RQ1 in the IORNTSP Survey*

QN / Statement	1	2	3	4	5	Total %
Q34. Faced challenges understanding concepts and seek clarification AFTER IP	7.7	47.3	11.0	31.9	0	97.8
Q36. Challenges faced to reach competence level during probation due to lack of resources	5.5	60.4	13.2	18.7	1.1	98.9
Q37. Challenges with confidence due to lack of skills and knowledge received in IP	1.1	56.0	14.3	25.3	1.1	97.8

Note. The percentage for each item did not reach a total of 100 as the option "N.A." was excluded; N = 91

Table 14 shows the mean (*M*), median (*MED*) and standard deviation (*SD*) for each statements regardless having undergone any of the TSPs.

Table 14

Mean, Median and SD of Statements that May Affect the OR NJNs' Knowledge and Skills in Performing New Job Role Related to RQ1 in the IORNTSP Survey

QN / Statement	<i>M</i>	<i>MED</i>	<i>SD</i>
Q17. Satisfaction level of OP content coverage	2.11	2	.55
Q27. Challenges faced after IP due to lack of technical skills exposure	2.64	2	.89
Q29. Challenges putting theory and skills together after IP based on level of nursing	3.21	4	1.1
Q32. Challenges after IP as content was not sufficient to function in role	2.54	2	.98
Q33. Faced challenges understanding concepts and seek clarification DURING IP	2.79	2	.98
Q34. Faced challenges understanding concepts and seek clarification AFTER IP	2.63	2	1.1
Q36. Challenges faced to reach competence level during probation due to lack of resources	2.46	2	.95
Q37. Challenges with confidence due to lack of skills and knowledge received in IP	2.63	2	.99

Note. N = 91

To aid in answering RQ1, an Independent T-test test was performed to compare the effect specialised OR IPs had on two different groups of NJNs. These included NJNs who did not receive specialised OR IPs and those who did. Two independent variables were used to answer RQ1. These included survey question 27, "I faced challenges after undergoing my induction programme as I did not receive the necessary and sufficient technical skills

required for my level for my new job role”, and survey question 29, “I faced challenges after undergoing the induction programme as I was unable to put theory into practice based on my level of OR nursing”. The dependent variable derived from question 19, “Did you receive an OR unit nursing specific specialisation induction programme after the completion of your general OR unit and hospital-wide orientation?”. Respondents were given the option to answer “yes” or “no” and were grouped according to the response given for Q19. Firstly, for Q27, the 85 NJNs who received a specialised OR IP ($M = 2.65$, $SD = .90$) compared to six participants who did not receive a specialised OR IP ($M = 2.50$, $SD = .84$) demonstrated no significant difference in effect specialised OR IPs had on two different groups of NJNs in terms of putting knowledge into practice after undergoing a specialised IP, $t(89) = .390$, $p = .679$. The magnitude of the differences in the means (mean difference = .147, 95% CI = -.602 to .896) was significant. Secondly, for Q29, the 85 NJNs who received a specialised OR IP ($M = 3.18$, $SD = 1.08$) compared to six participants who did not receive a specialised OR IP ($M = 3.67$, $SD = .82$) similarly demonstrated no significant difference in their ability to put theory into practice based on their level of OR nursing, $t(6.311) = -1.387$, $p = .212$. The magnitude of the differences in the means (mean difference = -.490, 95% CI = -1.345 to .364) was significant. Table 15 and Table 16 show the results from the Independent-Samples T-test.

Subsequently, using the overall test scores, Spearman’s rank-order correlation coefficient was computed to examine the relationship between OR NJNs perceived knowledge and skills received in performing job roles (Q27) and putting theory in practice (Q29) after undergoing their specialised IPs. The correlation coefficient $r_s = .14$, $n = 84$, $p > .05$ (Table 4.9) was two-tailed, suggesting a very weak positive correlation and no statistical significance between OR NJNs perceived knowledge and skills received in performing job

roles (Q27) and putting theory in practice (Q29) after undergoing their specialised IP. Table 17 shows the result of Spearman's rank-order correlation coefficient.

Table 15

Results of the Independent-Samples T-test for RQ1 for Q27

		M	SD	Levene's Test for Equality of Variances								
				F	Sig.	t	df	Sig (2 - tailed	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
											Lower	Upper
Q27	Yes	2.65	.896	.936	.336	.390	89	.697	.147	.377	-.602	.896
	No	.50	.837									

Note. N = 91

Table 16

Results of the Independent-Samples T-test for RQ1 for Q29

		<i>M</i>	<i>SD</i>	Levene's Test for Equality of Variances								
				F	Sig.	t	df	Sig (2 - tailed	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
											Lower	Upper
29	Yes	.18	.082	.333	.023	1.387116	.310818	.212	.490	.353392	1.344696	.364304
	No	.67	.816									

Note. N = 91

Table 17*Spearman's Rank-order for Q27 and Q29*

	Q27 Challenges faced after IP due to lack of technical skills exposure	Q29 Challenges putting theory and skills together after based on level of nursing
Q27 Challenges faced after IP due to lack of technical skills exposure	1.000	.144
Q29 Challenges putting theory and skills together based on level of nursing	.144	1.000

*Note. *p > .005, n = 84***Research Question 2:**

To what extent did the challenges NJNs in Singapore OR face with the OR unit-specific specialised nursing IP affect their ability to perform their roles?

To answer R2, each NJN responded to 13 statements from the IORNTSP survey related to either behaviour presentation or effects and types. These statements were evaluated using a 5-point Likert scale for NJNs to respond. The statements were scaled and coded between “Strongly agree = 1”, “Agree = 2”, “Neutral = 3”, “Disagree = 4”, and “Strongly disagree = 5”. Responses were coded accordingly in the data file with the exception of “N.A.”, which was assigned the value “0”. It was to indicate that the response did not apply to the question as the participant did not experience the matter in the statement. Thus, such data were excluded from the main test.

The researcher acknowledged that, in general, only between 1.1% and 2.2% of participants chose *N.A.* It was also important to note that the respondents were given this

option to acknowledge that they had not experienced the particular statement asked. The 13 items on the IORNTSP survey could be identified as challenges that might have affected OR NJNs' ability to perform their job roles after undergoing a specialised OR unit IP. These challenges varied through variables of behaviour presentation (2 items), effects and types (12 items). Table 18 illustrates the percentages and frequency of NGNs who responded to *N.A.* for the 13 items.

Table 18

Frequencies and Percentages of Respondents who Chose the Option N.A. for Statements Related to Q1

QN / Statement	<i>f</i>	%
26. New job role was effectively explained	1	1.1
27. Challenges faced after IP due to lack of technical skills exposure	0	0
28. Identified as a team member after IP	1	1.1
29. Challenges putting theory and skills together after IP based on level of nursing	1	1.1
30. Challenges with adaptation after IP due to lack of time to transition	1	1.1
31. Facilitator guided me well during IP	1	1.1
32. Challenges after IP as content was not sufficient to function in role	1	1.1
33. Faced challenges understanding concepts and seek clarification DURING IP	1	1.1

Note. N = 91

Continued Table 18

Frequencies and Percentages of Respondents who Chose the Option N.A. for Statements

Related to Q1

QN / Statement	<i>f</i>	<i>%</i>
34. Faced challenges understanding concepts and seek clarification AFTER IP	2	2.2
35. Was given sufficient time to reach competency before confirmation of role	2	2.2
36. Challenges with confidence due to lack of skills and knowledge reached in IP	2	2.2
37. Overall IP was helpful in preparing for job competence	2	2.2

Note. N = 91

Simple and multiple regression was executed to examine the relationships between the predictor variables, Q26 to Q37 with Q38. It was due to some respondents selecting N.A. for some statements. Thus, the analysis had to be separated to ensure that analysis measurements only included respondents who had experienced the statement asked.

A multiple regression was calculated to firstly predict Q38 based on Q26, Q28, Q29, Q30, Q31, Q32, Q33 and Q36. The scatterplot showed a significant and strong positive correlation for Q31 and Q38. It was confirmed with a Spearman's rank correlation coefficient of .60. Additionally, the scatterplot showed a significant but moderate negative correlation between Q30 and 38, Q32 and Q38 and Q36 and Q38. These were confirmed with a Spearman's rank correlation coefficient of -.56 for Q30 and Q38, -.52 for Q32 and 38, and -.54 for Q36 and Q38. The results of the regression of 10 predictors explained 74.7% of the variance ($R^2 = .558$, $F(10, 75) = 11.839$, $p < .0001$). However, it was found that Q38

significantly predicted only Q31 ($\beta = .434, t = 4.478, p < .0001$) and Q32 ($\beta = -.235, t = -2.197, p < .05$). Table 19 presents the results of the multiple regression analysis executed.

Table 19

Multiple Regression Analysis for Q26, Q28, Q29, Q30, Q31, Q32, Q33 and Q36 as Predictors of Q38

Variables	B	SE (B)	β	t	p
Q26	.217	.245	.085	.886	.379
Q28	-.139	.170	-.076	-.817	.417
Q29	.067	.078	.075	.859	.393
Q30	-.140	.098	-.169	-1.423	.159
Q31	.434	.097	.406	4.478	.000
Q32	-.235	.107	-.244	-2.197	0.031
Q33	.086	.080	.088	1.071	.287
Q36	-.161	.114	-.156	-1.414	.161

Note. $R^2 = .558; n = 84$

Next, a simple regression was calculated to predict Q38 based on Q27. The results of the regression of the predictor explained 37.6% of the variance ($R^2 = .376, F(1, 82) = 49.330, p < .001$). The regression equation for predicting Q38 as a function of Q27 was: $Q38 = -.630 (Q27) + 4.318$. Table 20 presents the results of the simple regression analysis executed for Q27 as a predictor for Q38.

Table 20*Simple Regression Analysis for Q27 as a Predictor for Q38*

Variables	B	SE (B)	β	t	p
Q27	-.630	.090	-.613	-7.024	<.001

Note. $R^2 = .376$, $n = 84$

Next, a simple regression was calculated to predict Q38 based on Q35. The scatterplot showed a significant but weak correlation. It was confirmed with a Spearman's rank correlation coefficient of $-.400$. The results of the regression of the predictor explained 16.1% of the variance ($R^2 = .161$, $F(1, 81) = 15.467$, $p < .001$). The regression equation for predicting Q38 as a function of Q35 was: $Q38 = -.354 (Q35) + 3.588$. Table 21 presents the results of the simple regression analysis executed for Q35 as a predictor for Q38.

Table 21*Simple Regression Analysis for Q35 as a Predictor for Q38*

Variables	B	SE (B)	β	t	p
Q35	-.354	.090	-.400	-3.933	<.001

Note. $R^2 = .161$, $n = 83$

Lastly, a multiple regression was calculated to predict Q38 based on Q34 and Q37. The results of the regression of two predictors explained 29.7% of the variance ($R^2 = .545$, $F(2, 82) = 16.934$, $p < .001$). However, it was found that Q38 significantly predicted only Q37 ($\beta = -.481$, $t = -4.501$, $p < .001$). The regression equation for predicting Q38 as a function of Q37 was: $Q38 = -.481 (Q37) + 4.247$. The scatterplot executed for Q34 with Q38 and Q37 with Q38 shared similar findings. The scatterplot showed a significant but weak negative linear relationship between Q34 and Q38 but a significant but moderate negative linear relationship between Q37 and Q38. These were further confirmed by Spearman's rank

correlation coefficient of $-.360$ for Q34 and Q38 and $-.556$ for Q37 and Q38. Table 22 presents the results of the multiple regression analysis executed.

Table 22

Multiple Regression Analysis for Q34 and Q37 as a Predictor for Q38

Variables	B	SE (B)	β	t	p
Q34	-.103	.095	-.115	-1.081	.283
Q37	-.487	.108	-.481	-4.501	<.001

Note. $R^2 = .545$, $n = 83$

To evaluate the difference between Singapore OR NJNs with specialised OR IP and those with none over challenges that impacted their ability to perform their job roles, the Mann-Whitney U Test. The test revealed an insignificant difference in Singapore OR NJNs with specialised OR IP ($MED = 2$, $n = 85$) and those with none ($M = 2$, $n = 6$), $U = 236.500$, $z = -.340$, $p = .734$, $r = .04$. Hence, the data suggested challenges that impacted Singapore OR NJNs with their ability to perform their job roles was not influenced by whether they received a specialised OR IP and those with none—suggesting that OR NJNs face challenges regardless of the presence of an IP that later impact them in their job roles.

Spearman's rank-order correlation was run to examine the relationship between challenges faced understanding concepts and seeking clarification during IP (Q33) and challenges faced understanding concepts and seeking clarification after IP (Q34). There was a weak correlation positive correlation and statistical significance between challenges faced understanding concepts and seeking clarification during IP and challenges faced understanding concepts and seeking clarification after IP of Singapore OR NJNs, $r_s = .22$, $n = 90$, $p = .03$. The results suggested that there was a relationship of challenges faced understanding concepts and seek clarification before and after IP.

Hypotheses:

H1₀. *Having an OR unit-specific specialised nursing IP would not result in the enhancement of OR NJNs in Singapore's knowledge and skills in performing their new job roles.*

H1_a. *Having an OR unit-specific specialised nursing IP would result in the enhancement of OR NJNs in Singapore's knowledge and skills in performing their new job roles.*

H2₀. *OR unit-specific specialised nursing IPs did not affect Singapore OR NJNs' challenges with their ability to perform their roles.*

H2_a. *OR unit-specific specialised nursing IPs affected the challenges Singapore OR NJNs faced with their ability to perform their roles.*

Spearman's rank-order correlations were run to examine the correlations of 13 variables and identify if a relationship existed between nursing IPs' impacts on NJNs in the Singapore OR unit and the knowledge and skills in performing their new job role. To better structure the variables, statements questions were given codes to make sense of variables. Table 23 illustrates these descriptions. Moreover, participants who entered 'N.A' for any statements were excluded from Spearman's test to reduce bias in the analysis. Thus, the researcher ran several analysis groups to ensure that all variables correlations were examined accurately based on the responses applied.

Table 23*Codes for Question Statements*

Question statements	Codes
26. My new job role in the OR was effectively explained during the induction programme.	26. Job description
27. I faced challenges after undergoing my induction programme as I did not receive the necessary and sufficient technical skills required for my level for my new job role.	27. Lack in receiving the necessary and sufficient technical skills
28. I am identified as a member of the team I am allocated to after undergoing the induction programme.	28. Team acknowledgement
29. I faced challenges after undergoing the induction programme as I was unable to put theory into practice based on my level of OR nursing.	29. In ability to put theory into practice based
30. I faced challenges after undergoing the induction programme as I was not given enough time to adapt to my new job role.	30. Lack of adaptation time
31. My facilitator guided me well according to my level during the induction programme.	31. Facilitator guidance

Continued Table 23*Codes for Question Statements*

Question statements	Codes
32. I faced challenges after undergoing my induction programme as the topics covered during the induction programme were not sufficient to prepare me for my new job role at my level.	32. Insufficient topic coverage during IP
33. I faced challenges in helping understand concepts and seeking clarification on the topics covered during the induction programme.	33. Seeking understanding and clarity of contents during IP
34. I faced challenges in helping understand concepts and seeking clarification on the topics covered after undergoing the induction programme.	34. Seeking understanding and clarity of contents after IP
35. I was given sufficient time, at my level, to reach the competency level for my new job role before I was confirmed.	35. Provided sufficient time reach competence level before role confirmation
36. I faced challenges in reaching the competence level for my new job role based on my level during my probation period as I was not given sufficient resources in the induction programme	36. Challenges in reaching competence level due to lack of time given during probation

Continued Table 23*Codes for Question Statements*

Question statements	Codes
37. I faced challenges with my confidence as I did not receive the skills and knowledge required for my level of OR nursing in the induction programme.	37. Challenges in self-confidence in job role due to lack of skills and knowledge received
38. Overall, the OR unit nursing specific specialization induction programme was helpful in preparing me for my competence with my OR job role.	38. IP was overall helpful in job role preparation
39. Overall, after undergoing the induction programme, I find the job role I was assigned fit to me.	39. Overall job role suitability after undergoing IP

Spearman's rank-order correlation was first run to examine the relationship between job description (Q26), team acknowledgement (Q28), inability to put theory into practice based (Q29), lack of adaptation time (Q30), facilitator guidance (Q31), insufficient topic coverage during IP (Q32), seeking understanding and clarity of contents during IP (Q33), challenges in reaching competence level due to lack of time given during probation (Q36), IP was overall helpful in job role preparation (Q38), and overall job role suitability after undergoing IP (Q39). There were strong positive correlation and statistical significance between lack of adaptation time (Q30) and insufficient topic coverage during IP (Q32), $r_s = .62$, $n = 84$, $p = <.001$, lack of adaptation time (Q30) and challenges in reaching competence level due to lack of time given during probation (Q36), $r_s = .62$, $n = 84$, $p = <.001$, facilitator

guidance (Q31) and IP was overall helpful in job role preparation (Q38), $r_s = .60$, $n = 84$, $p = <.001$, and insufficient topic coverage during IP (Q32) and challenges in reaching competence level due to lack of time given during probation (Q36), $r_s = .61$, $n = 84$, $p = <.001$. Also, there were moderate positive correlation and statistical significance between job description (Q26) and team acknowledgement (Q28), $r_s = .42$, $n = 84$, $p = <.001$, IP was overall helpful in job role preparation (Q38) and overall job role suitability after undergoing IP (Q39), $r_s = .54$, $n = 84$, $p = <.001$. Additionally, there were moderate negative correlation and statistical significance between lack of adaptation time (Q30) and facilitator guidance (Q31), $r_s = -.43$, $n = 84$, $p = <.001$., lack of adaptation time (Q30) and IP was overall helpful in job role preparation (Q38), $r_s = -.56$, $n = 84$, $p = <.001$, lack of adaptation time (Q30) and overall job role suitability after undergoing IP (Q39), $r_s = -.43$, $n = 84$, $p = <.001$, insufficient topic coverage during IP (Q32) and IP was overall helpful in job role preparation (Q38), $r_s = -.54$, $n = 84$, $p = <.001$, facilitator guidance (Q31) and challenges in reaching competence level due to lack of time given during probation (Q36), $r_s = -.40$, $n = 84$, $p = <.001$, and challenges in reaching competence level due to lack of time given during probation (Q36) and IP was overall helpful in job role preparation (Q38), $r_s = -.52$, $n = 84$, $p = <.001$. Table 24 presents the results for the first test of group data that had no missing values in its data set.

Table 24

Spearman Rank-order Correlations between Q26, Q28, Q29, Q30, Q31, Q32, Q33, Q36, Q38 and Q39

	Q26	Q28	Q29	Q30	Q31	Q32	Q33	Q36	Q38	Q39
Q26		.42**	-.33**	-.04	.08	-.12	-.02	-.00	.16	.24*
Q28	.42**		-.09	-.14	.11	-.14	-.04	-.25*	.11	.17
Q29	-.33**	-.09		.30**	-.26*	.16	.03	.20	-.18	-.24*
Q30	-.04	-.14	.30**		-.43**	.62**	.20	.62**	-.56**	-.43**
Q31	.08	.11	-.26*	-.43**		-.29**	.16	-.40**	.60**	.36**
Q32	-.12	-.14	.16	.62**	-.29**		.23*	.61**	-.54**	-.32**
Q33	-.02	-.04	.03	.20	.16	.23*		.14	.02	-.24**
Q36	-.00	-.25*	.20	.62**	-.40**	.61**	.14		-.52**	-.30**
Q38	.16	.11	-.18	-.56**	.60**	-.54**	.02	-.52**		.54**
Q39	.24*	.17	-.24*	-.43**	.36**	-.32**	-.24**	-.30**	.54**	

*Correlation is significant at the 0.01 level (2-tailed). ***

*Correlation is significant at the 0.05 level (2-tailed). **

n = 84

Next, Spearman's rank-order correlation was run to examine the relationship between a lack in receiving the necessary and sufficient technical skills (Q27), IP was overall helpful in job role preparation (Q38), and overall job role suitability after undergoing IP (Q39).

There was a strong negative correlation and statistical significance between a lack in receiving the necessary and sufficient technical skills (Q27) and IP was overall helpful in job role preparation (Q38), $r_s = -.62$, $n = 84$, $p = <.001$, and weak negative correlation and statistical significance between a lack in receiving the necessary and sufficient technical skills (Q27) and overall job role suitability after undergoing IP (Q39), $r_s = -.62$, $n = 84$, $p =$

.005. Table 25 presents the results for the second test of group data that had no missing values in its data set.

Table 25

Spearman Rank-order Correlations Q27, Q38 and Q39

	Q27	Q38	Q39
Q27		-.62**	-.30**
Q38	-.62**		.54**
Q39	-.30**	.54**	

*Correlation is significant at the 0.01 level (2-tailed). ***

n = 84

Subsequently, a Spearman's rank-order correlation was run to examine the relationship between seeking understanding and clarity of contents after IP (Q34), challenges in self-confidence in job role due to lack of skills and knowledge received (Q37), IP was overall helpful in job role preparation (Q38), and overall job role suitability after undergoing IP (Q39). There was moderate positive correlation and statistical significance between seeking understanding and clarity of contents after IP (Q34) and challenges in self-confidence in job role due to lack of skills and knowledge received (Q37), $rs = .50$, $n = 83$, $p = <.001$, and moderate negative correlation and statistical significance between challenges in self-confidence in job role due to lack of skills and knowledge received (Q37) and IP was overall helpful in job role preparation (Q38), $rs = -.56$, $n = 83$, $p = .005$. Table 26 presents the results for the third test of group data that had no missing values in its data set.

Table 26*Spearman Rank-order Correlations between Q34, Q37, Q38 and Q39*

	Q34	Q37	Q38	Q39
Q34		.50**	-.36**	-.37**
Q37	.50**		-.56**	-.40**
Q38	-.36**	-.56**		.54**
Q39	-.37**	-.40**	.54**	

*Correlation is significant at the 0.01 level (2-tailed). ****n* = 83

Lastly, Spearman's rank-order correlation was run to examine the relationship between providing sufficient time to reach competence level before role confirmation (Q35), IP was overall helpful in job role preparation (Q38), and overall job role suitability after undergoing IP (Q39). There was moderate negative correlation and statistical significance between providing sufficient time to reach competence level before role confirmation (Q35) and IP was overall helpful in job role preparation (Q38), $r_s = -.41$, $n = 83$, $p = <.001$, and weak negative correlation and statistical significance between provided sufficient time reach competence level before role confirmation (Q35) and overall job role suitability after undergoing IP (Q39), $r_s = -.28$, $n = 83$, $p = .011$. Table 27 presents the results for the fourth test of group data that had no missing values in its data set.

Table 27*Spearman Rank-order Correlations between Q35, Q38 and Q39*

	Q35	Q38	Q39
Q35		-.41**	-.28*
Q38	-.41**		.54**
Q39	-.28*	.54**	

*Correlation is significant at the 0.01 level (2-tailed). ***

*Correlation is significant at the 0.05 level (2-tailed). **

n = 84

Qualitative Study

The qualitative phenomenology study aimed to explore the impacts OR nursing IPs had on NJNs in Singapore units to prepare nurses better to provide competent OR nursing care. RQ1 and RQ2 guided the qualitative phenomenology study.

The transcribing of qualitative data collected began with the researcher listening to the audio recording of the interviews several times, then transcribed verbatim by hand into an MS Word document for each participant based on the interview guide questions and their responses. The research diary containing observations recorded during the interview sessions provided reference and clarity during analysis interpretations. Member-checking occurred by contacting interviewees with completed transcripts via email to ensure that verbatim transcribed were correct data used. Participants also had the opportunity to provide clarification, additional information and a summary of their initial responses if necessary. As discussed earlier in Chapter 3, Braun and Clarke's (2014) six-step thematic analysis process was used to organise the findings. These six steps included i) familiarising oneself with the data, ii) coding the data, iii) searching for themes, iv) reviewing the themes, v) defining and renaming the themes, and vi) producing the report. The thematic analysis helped the

researcher answer the research questions by moving beyond the narrative text provided by participants. The method allowed the identification, analysis and interpretation of concepts or ideas that develop patterns to help discover codes, then subthemes, and finally, create themes to answer the research questions (Braun & Clarke, 2014). The remainder of this section will present the results from data collected during the qualitative study.

Summary of Participants

Purposive sampling was used to select and invite participants to participate in the qualitative study. Participants were invited through an email invitation, and once participants replied agreeing to participate, an informed consent (Appendix K) was forwarded to be completed, and dates and times were arranged accordingly to schedule the face-to-face interview via Zoom for each participant. Recruitment emails were sent to all participants who provided their emails in the response tab. A total of 13 recruitment emails were sent, with nine who responded. All except one participant replied that they were invited for an interview session as they met the inclusion criteria. The age group of the OR nurses interviewed was between 22 and 35 years old. All the nurses interviewed were RNs, and the majority were scrub and scout nurses ($n = 6$). Most of the nurses interviewed attained a bachelor of science in nursing, and most of the nurses have been in their current OR unit for less than two years ($n = 6$). All participants were assigned a code from P1 to P8 in chronological order of the interview dates. Each interview generally took between 30 minutes and 45 minutes to complete. The process included an introduction, answering the interview session based on the qualitative self-developed guided questionnaire (Appendix H) and a summary to thank participants for contributing to the study. Participants were informed that only the interview section would be recorded using a voice memo through an iPhone 12 mini, which was only accessible by the researcher through a PIN code, and assured participants that voice recordings would be deleted after verbatim had been transcribed to Microsoft Word for Mac

document version 16.65. Overall, 24 questions were asked. Table 28 describes the participants' demographics and the dates and lengths of each interview. For the participants' privacy, as requested, the age and years worked in the current OR unit have been de-identified to maintain anonymity.

Table 28

Qualitative Participant Demographic Data

Participant ID	Gender	Job Role	Interview Date	Time	# Transcript Pages
P1	Female	Scrub / scout nurse	13/05/2022	20:29	6
P2	Male	Anaesthetic / Recovery nurse	16/05/2022	10:42	4
P3	Female	Scrub / scout nurse	16/05/2022	11:00	4
P4	Male	Anaesthetic nurse	17/05/2022	6:56	4
P5	Female	Scrub / scout nurse	18/05/2022	8:39	4
P6	Male	Scrub / scout nurse	20/05/2022	13:40	4
P7	Male	Scrub / scout nurse	21/05/2022	11:25	4
P8	Female	Scrub / scout nurse	24/05/2022	9:53	4

Note. N = 8. Times New Roman with font 12, 1.5 spacing was used for transcripts

During the introduction stage of the Zoom face-to-face interview session, participants were told that there were no correct answers to the questions asked and were encouraged to give an honest account as much as possible. The researcher used a research diary to record the personalities and backgrounds of the participants during the introduction part and any observations that might be useful to the data collected. These included the researcher's thoughts and the participants' upper body language and tone of voice during the interview. Lower body language could not be observed as the frame for observation through Zoom only

allowed upper body visibility. As a result of the research diary that captured these observations, the researcher was able to capture information that provided clarity to the audio recordings. The interviews offered narrative text to describe Singapore NJNs' experience with the impacts specialised OR unit IP has on them. Data saturation was reached after five interviews. However, the researcher continued to follow through with the last three participants, who were keen to share their experiences regarding the phenomenon. No new concepts or ideas were informed, thus confirming that data has reached saturation (Braun & Clarke, 2019). The study's findings reported six main themes related to the impacts OR nursing IPs had on Singapore OR NJNs, which will be discussed in the following sections of this chapter.

Participant Narratives

Qualitative inquiry allowed the researcher the opportunity to engage with the Singapore OR NJNs as the researcher investigated the phenomenon surrounding how they experienced and understood the impacts of their OR nursing IPs. The researcher uncovered OR NJNs who could speak to their lived experiences with the OR nursing IPs they received. The following descriptions were designed to help the readers of the study feel the essence of the participants' experiences. Part of the descriptions were recorded in the researcher's research diary to avoid losing direction during the central questioning aspect of the Zoom interview. These included personal opinions of how the researcher precepted the participant, their body language and tone of voice, as discussed earlier.

P1 was a 22-year-old female RN working in the major operating theatres. She identified as a scrub scout nurse. Her highest qualification obtained was a Diploma in nursing from one of the Singapore polytechnics. P1 was a well-spoken RN committed to sharing her experiences regarding the phenomenon. She claimed that her seniors did not undergo the nursing IPs that she underwent. She felt that her batch was fortunate to have received such a

structured IP that her seniors did not and thought it was advantageous because she was exposed to areas for which her seniors were not given the opportunity. She believed that the information she received during her IP was helpful in her job role preparedness; however, she felt that some were irrelevant to her learning, thus overloading her learning information. Nonetheless, she valued the pointers she received as they were helpful in cases where staff shortages were present, and she could voice her concerns during her IP. She suggested that future OR nursing IPs be designed to tailor to each nurse's roles so that they could focus better on performing better during their first year of OR nursing practice. She added that it would help reduce the overwhelming expectations of being a new nurse. P1's commentary advocated the premise that the availability of IPs was an essential tool for OR NJNs. She mentioned that:

Umm...one thing I like about the orientation programme is that it prepares us for. For. For our main job like a scrub nurse for assisting the surgeons in the operation. And that they really that the time to explain to us and introduce us to the instruments, the flow of the operation and all. And I think that is very helpful because for us like fresh grads we might not know that much in school or maybe we probably skip (giggles) all the lectures...you know ya...And ya.

P2 was a 31-year-old male RN working in the major operating theatres. He has been practicing nursing since 2012, starting his career in the emergency department. He transitioned to work in the OR unit in 2020, seeking a career change in nursing. He identified as an anaesthetic and recovery room nurse. He was relaxed in sharing his recollections regarding his experiences. He generally described his OR nursing IP to include aspects of workflows, policies and procedures concerning his OR unit. He found that the OR nursing IP he received was sufficient for him to function in his daily role and believed it was adequate for beginner OR nurses to embark on their OR nursing career. However, he found that the

gaps when faced with challenging OR patient scenarios were not pleasant for beginner nurses when it happened. Additionally, he found that the programme included repetitive information and suggested that it be delivered in multiple sessions to improve attention span. Nonetheless, he believed that taking down mental notes from the theoretical sessions would help them react better. He suggested that future OR nursing IPs include more hands-on practicum to reflect whether learning retention was achieved. He shared that the ability to provide feedback was essential, and to see NJNs' feedback being considered was commendable. He commented:

I think we get that opportunity to voice out. And...and they take our...take our opinion into consideration and they did...did what we suggested to. So it was quite nice.

P3 was a 32-year-old female RN working in the main operating theatres in Singapore. She has been practicing nursing since 2014 as a theatre nurse and moved to Singapore in 2020, seeking a better career prospect in nursing overseas. She identified as a scrub scout nurse. She had a bubbly personality and was very lively when sharing her experiences regarding her OR nursing IP. She described her IP as being segregated into two parts. It included a week with the clinical educator and the rest of the weeks of her IP being buddied with a nurse practicing in her specialities to guide her. Her recollection of her experience was compared to her OR nursing days back home. She expressed that the main difference was the fast turnover rate between procedures, which was her primary challenge. She suggested that future IPs acknowledge that overseas nurses' experiences differed and include more proper training in some areas of speciality practices. She advocated:

I think the main, my concern is because I am a. I came from overseas experience. So I have done undergone the proper in-service of each system of they that I have to work to. So I think that's what's missing. Like a proper in-service of each system and what instrumentation we will be using.

P4 was a 30-year-old female RN working in the major operating theatres in Singapore. He has been practicing nursing since 2013, starting as an EN in the OR. He recently achieved his diploma in nursing from one of the two leading providers of nursing schools in Singapore. He identified himself as an anaesthetic RN nurse. He was demure and indifferent when sharing his experiences regarding his OR nursing IP. He described his IP as very detailed and that they taught him the ropes of his job, allowing him to adapt well to his role. He did not recall having faced any challenges due to the IP he received. He felt that the IP he underwent was rather long and chuckled when recalling his experience. He shared that:

Sometimes it takes the whole day.

P5 was a 26-year-old female RN working in the major operating theatres in Singapore. She achieved a bachelor's degree in nursing, her highest nursing qualification. Her memory of the OR nursing IP she received was informal in some areas. She was crucial when sharing some of her experiences with her IP. However, she also expressed amusement when reminiscing about the time she underwent her IP. Her main recollection of her IP was how important it was for her to understand the role of the scrub nurse. She described the gowning, gloving and hand hygiene skills as the essential aspect of her role and was the centre of the discussion of her lived experience. She believed that regardless of the formality of the IP one would receive, the presence of one was better than nothing. Although she thought her IP was sufficient to guide her in the role, she suggested that future OR nursing IPs deliver practicum as close to the actual situation as possible to avoid reality shock when placed in the clinical area. She offered her suggestion for a change to future OR nursing IP curriculum developers.:

I would say more kindna basic kindna of umm how to say more like generalise surgeries in EOT. Like in emergency OT. Actually get kindna more basic knowledge.

So like we don't go in just like a very simple kind of a knowledge umm of a very simple case. More like complexities of cases I think.

P6 was a 35-year-old male RN working in a day surgery operating theatre in Singapore. He immigrated to Singapore in 2015 and achieved a bachelor's degree in nursing, his highest nursing qualification. During the interview, he exhibited a flamboyant characteristic and was nonchalant when sharing his experience. He considered his OR IP formal. However, he felt he was rushed into moving into his role because he had experience as an OR nurse. He thought the IP he received had no impact because it was too generalised. He recalled how the IP taught him formality when greeting his colleagues. He pointed out that the IP he received in his current unit was less tedious than the previous one. His experiences in different OR units also helped him adapt to his current unit. He believed that the IP he received should acknowledge OR NGNs' concerns as the actual work environment of the OR might differ from what was thought in the classroom. He suggested that future IPs should be tailored to the needs of all nurses, regardless of experience, and should be formal and detailed so one could transition to the new workplace with fewer challenges. He advocated:

I guess it is more on towards on having a more detailed training on where they want to go. Umm actually, based on my training that I had in my previous workplace I had a preceptor to guide me, encourage me and help me improve my skills as compared to what I have recently gone through where we have a new grad where they just throw them on the field and let them learn from their own mistakes. So I think that is one thing I suggest to have a strong preceptorship programme to nurture new nurses.

P7 was a 31-year-old male RN working in a day surgery operating theatre. He immigrated to Singapore in 2014 and had achieved a master's in nursing science as his

highest nursing qualification. He had been practicing in the operating theatre for 12 years. He identified himself as a scrub scout nurse. He had a carefree attitude during the interview and was keen to share his experience of his latest OR unit and make a comparison to the previous units he had worked in. He described his new OR unit as small; thus, there was not much to orientate new staff about. He described the IP he received as informal. He was given a booklet to complete within three to six months, where he had to achieve the required skills. His recollection of his new OR unit IP was centred around how it was not difficult for him to adapt to his new unit despite the existing gaps with the IP delivered. He overcame his challenges using his past experiences in his previous OR units. He felt that it was good to cut a programme short for employees who already had experience in the unit, thus allowing them to start work sooner. However, he advocated for IPs to be delivered more systematically rather than being casual just because a unit was small. He advocated:

I think they should have a proper guideline or a proper protocol to...to...to orientated to rather than like. I find it in my current workplace orientation is not really systematic. I mean it is done by one of the CI but it is not very systematic unlike my previous workplace. Because my workplace is small they were not so strict.

P8 was a 33-year-old female RN working in a major surgery operating theatre. She immigrated to Singapore in 2015. She had been practicing as an OR nurse for four years before moving to Singapore and holds a degree in nursing. She was very engaging throughout the interview session, starting from the introduction. However, she was critical when sharing her experience about her Singapore OR nursing IP. She described the OR nursing IP she received as impressive compared to the IP she received back home. She felt that the programme's facilitators were informative, kind and warm. She shared that she was well-orientated about her unit layout and how some nurses function in their respective workstations in the OR. However, she felt that regardless of how well-developed a

programme might be, it might not fully prepare an individual for actual practice. She believed that the skills required would eventually be developed when repeated daily. She also added that the language and culture differences during the IP impacted her learning retention. Nonetheless, she suggested that future IP include more interactive sessions so that nurses could share their learning and make the daily IP session more interactive. She advocated:

If there were something I could change. Maybe umm provide more interaction, provide more umm ya I think more like interactive so it won't be so boring and also give other people to gather their information to share what they think about the programme and they also share what other culture they have in their previous hospital.

Data Coding

To answer RQ1 and RQ2, all codes were analysed into subthemes, which were later analysed and created into themes. Table 29 shows the themes and subthemes for RQ1 and RQ2, and Appendix M summarises response codes, subthemes and themes that helped answer both RQs. The author acknowledged that the six themes developed were also the results of the responses obtained during the interviews. These involved the evolution of response codes to subthemes and the main theme.

Table 29

Themes and Subthemes for RQ1 and RQ2

Themes	Subthemes
RQ1 Theme 1: Quality of IP	1. Availability of IP
	2. Delivery of IP
	3. Length of IP
	4. Content of IP
	5. Satisfaction of IP
	6. Comparing IPs

Cont. Table 29*Themes and Subthemes for RQ1 and RQ2*

Themes	Subthemes
RQ 1 Theme 2: Skills and knowledge acquisition	1. Tools to attain skills and knowledge 2. Learning exposure 3. Learning initiative
RQ2 Theme 1: Adapting to a new clinical environment	1. Immersing to a new work environment 2. Tools to help function in a new clinical environment 3. Resilience
RQ2 Theme 2: Quality of IP	1. Satisfaction of IP delivery content 2. Outcome of IP in work preparedness 3. Ability to grasp learning
RQ2 Theme 3: Resource person during IP	1. Quality of facilitator 2. Availability of resource person
RQ 2 Theme 4: Challenges with skills and knowledge acquisition	1. Information overloading 2. Classroom versus reality 3. Accessibility to OR nursing skills and knowledge

Research Question 1:

The questions in the qualitative interview guide helped gather responses from the participants for RQ1. Each participant spoke of their previous experiences on how having an OR unit-specific specialised nursing IP enhanced their knowledge and skills in performing new job roles and how they tried to make sense of this new role due to the impacts of their IPs. The broad themes that emerged across all the data sets were approached similarly by

each participant; however, some participants had moments captured differently in the related sub-themes.

RQ1 Theme 1. Quality of IP. The interview responses showed that IP quality was pivotal in enhancing Singapore OR unit nurses' knowledge and skills in performing new job roles. A presentation of response codes that developed the subthemes and later the central RQ1 theme one from responses from the interviews can be found in Appendix M. Theme 1 was defined by the most frequent similar responses experienced by participants with the quality of their IP. Responses deep into the interviews reflected how it impacted their career in OR nursing. The theme was divided into six sub-themes: availability, delivery, length, content, satisfaction, and comparing of the IPs.

RQ1 Theme 1 - Subtheme 1. Availability of IP. Most participants ($n = 6$) stated that they underwent an OR unit nursing-specific specialised IP, different from that of the hospital-wide newly-joint employee programme, to prepare them for their new job role after undergoing the OR unit orientation. They shared that the specialised IP they received differed from the OP, which was generally delivered in the first week of starting in the organisation. The IP provided in the OR unit was more focused on OR-specific job roles. P1 shared:

Yes aaa they thought us how to...wear a gown that's more on the practical side...Yup that's it.

However, for two participant, P3 and P6, who did not receive a specialised OR IP or to the extent that it was not specialised enough in his view, it was because the unit knew about their experience as an OR nurse. P6 revealed:

Umm. No. We did have a general induction programme for all the new employees.

But in term of specializations...nah...just like hands-on immediately because knowing the background so umm ya.

The researcher verified the statement through member-checking, and P6 confirmed that the OR IP he received was not specialised to the extent that they knew about his experience and most units were done online. However, he emphasised that the IP was available but said no because he did not find it specialised enough. He shared:

Fine. They were specific on your job description.

The first subtheme for RQ 1 theme 1 provided an opening dialogue for the research to probe further about the quality of the IP the participants received. The majority of the participants would later share how having an OR unit IP that focused on OR-specific job scope impacted them in their daily work roles. The interview dialogue would later progress into how the delivery of the IPs was.

RQ1 Theme 1 - Subtheme 2. Delivery of IP. Two participants revealed that their IPs were considered to be delivered informally. The impact of the informal IP delivery was minimal as both participants pointed out they would eventually learn more about the hands-on role when being sent into the field. For P5, she could dissect the topic of the delivery of her IP into two. Although she primarily felt that her IP and OP were informal, as expressed in her own words, ‘not really very formal’ and reiterated, ‘I would say it wasn’t very formal’, she mentioned that eventually, with very knowledgeable instructors delivering the programme and instilling them with the basic knowledge of OR nursing practice, they would subsequently perfect their basic skills. She indicated:

Umm...I wouldn't say so because umm...I mean the theory and practical wise of hand hygiene and gown up of glove and gowns were actually quite like a very basic for us. So it was drill into us during the orientation so I would say it was quite sufficient so I would say it didn't it ahh I didn't feel that there was any difficulties because it was like kinda drilled into me already.

For P7, he expressed that the delivery of his IP was informal because the size of the hospital he was working in was small, and there was not much to orientate. He expressed his opinion that regardless of the delivery of the IP, nurses would not learn immediately after clinical education as the former would require on-the-job training to understand the concepts of the teachings. He expressed:

Orientation ya I mean it is good but that is not where you learn straight away because in one go you won't learn everything or most of the things you won't even know or remember or even retain. But you will know more when you are on the job itself you can learn from yourself or from your colleagues.

In contrast, the other six participants who mentioned that their IP delivery was formal shared that the formal delivery of their IPs was such because it was done thoroughly, delivered by well-informed OR clinical instructors and delivered in parts within the period the programmes ran. For P2, he found that the thorough delivery of his IP helped him understand the basic job scope of his new role. However, he felt he struggled to grasp his functions in emergency cases. Nonetheless, he thought that if those topics had not been heavily compacted into a few days, it would have provided him more clarity. Additionally, he revealed that those advanced skills would be learned on the job when one encountered them and later got used to those cases. He specified:

...there were some challenges like ahh some workflows that I felt could have been done better. I mean like ahh emergency cases where they needed emergency airway intubation, the where they stuff were kept ahh any like inaccessible items....

....it wasn't really touched on but it was just briefly said....

....But that was a ya more a skill that later on I I heard about that I needed to like get use to lah.

For the other participants who expressed that their IP was delivered formally, they similarly described that it was provided in parts during the weeks their programmes were held. Although they faced some challenges, the impact of the delivery of their IP was not significant as they were able to digest information at their capable best when not overloaded with delivery contents. It indicated that the delivery of IPs did not impact IP quality when delivered formally.

RQ1 Theme 1 - Subtheme 3. Length of IP. Each participant shared a timeline of the IP programme that was delivered to describe how it enhanced their knowledge and skills in performing their new job roles. In general, most classroom aspects of the IPs were identified by six participants to run between a few days to three weeks. Two participants (P4 and P8) stated their IP ran for three months. It was later confirmed through member-checking that the three months of IP they expressed included the total period required to reach their expected competence level as a novice OR nurse. P1 described this phenomenon in more detail when she shared how she went about her IP. She stated:

So that for the remaining time in the 3 months later, they can actually focus on their discipline. Unlike us who, went through a 6 months training without knowing our discipline. Ya...so right now they will train for 3 months, and then they will know their discipline and then the other 3 months they would focus on their discipline.

To a degree, the impacts of the length of IP on the participants were evident during the interviews. Although the length of the IPs of the participants was sufficient to prepare them for their job roles, they shared that the long days, and for some participants weeks, spent in the classroom absorbing information led to the overloading of knowledge that they did not notably register all aspect of the information. For P1, she expressed that there was no need to go through all units of OR nursing when she was still not given a definite role. She expressed:

...I feel that lessons can be more concise and we don't need to take a long time to go through each and every component and for the rotation wise in each discipline, I feel that arr...can also be shorter because we don't know which discipline we are going to. And staying in one discipline for too long might...might umm...like how to say, too much information...

For nurses who had previous experience as an OR nurse or had experience working as a nurse in other units, sitting in the classroom for continuous days was described to be redundant, especially when they possessed basic nursing knowledge applicable to all areas of nursing. P2 shared:

...brief me better on another date maybe because maybe there was too much information on during the 2-3 days lah ya.

Similarly for P6 who had years of experience as an OR nurse, he expressed:

But at the end of the programme to be honest umm it just went on the other ear. Like 'what did you say?'

On the other hand, for P7, he found that the length of his IP was sufficient to prepare him for his job role in his new workplace because he had many years of experience in the OR nursing profession. He shared:

I mean like I have been in the theatre for many years before I work in my current place. So I feel that I don't really need to be orientated much on things.

In summary, the length of IP was perceived as having a significant role in gaining the knowledge and skills required for their job roles. OR units need to be aware that although more extended classroom sessions could be beneficial for nurses to understand the concept of OR nursing job scope, it could prove to be redundant if most information were not retained because of the overloading of information. It was interpreted to negatively impact the quality of IPs delivered.

RQ1 Theme 1 - Subtheme 4. Content of IP. The contents covered in OR nursing IPs depended on the role of the nurses. Although, as discussed by participants, their IP contents were delivered with all the different functions of nurses working in the unit, it was observed that the contents that were not related could be helpful for OR nurses. It enhanced their knowledge of the different roles of nurses working in the unit. Three participants shared that areas covered during their IP included content related to a scrub nurse's role. Two participants also shared that they were briefed regarding the workflow of their OR unit. For P8, the general introduction to the different job scopes in the OR allowed her to understand the workflows of those areas. She said:

Umm they cover about the scrub side the anaesthetics side and then the flow inside the theatre. How the recovery side and also the reception. We also had the chance to go to other areas to check how the flow of the unit is going.

Similarly, for P3, the areas outside the OR shared during her IP provided her insights into the working partnership between departments. She shared:

Umm scopes when you are doing scrub scout and each of the doctor's preferences or where how were are going to sort our trays especially in ortho we have a lot of loan and some implant stuff that that that side. Not only inside the theatre but who you are going to work with outside the theatre. Who you are going to umm going to talk to when you needed something.

For P5, a scrub nurse, she described the contents covered during her IP as more focused on the skills that she was required to be competent that were directed for the role of a scrub nurse. She described:

um more core unit base kindna competency. So more like specialise for scrub nurses.

However, some participants described that the contents shared during their IP could be excessive. They stated that the overloading of information causes low learning retention

and the disability to grasp the subject's content. Moreover, the oversharing of the role of scrub nurses led to a gap in understanding other roles in more detail. Nonetheless, the impact of the contents shared during the nurses' IP allowed them to gain knowledge of the functions of different nurses who worked in the unit and professionals who worked in partnership with the OR unit.

RQ1 Theme 1 - Subtheme 5. Satisfaction of IP. Part of an IP quality was revealed to be how satisfied nurses were with the IPs delivered. The code that derived the subtheme was the participants' description of the sufficiency of their IP to prepare them for their job roles. This involved the connection between subthemes 1 to 4 of RQ1. These factors enhanced nurses' preparedness for the assigned job roles. Participants who had experience as an OR nurse or experience as a nurse in other nursing specialties were unprejudiced about the satisfaction of the IP received because the basic knowledge shared in IPs was sufficient for them to function in their roles. However, this was not the case for a novice nurse. P3 pointed out:

I think the information the orientation period is sufficient because I have experience.

But if you are a newbie. A week of orientation just on your own is not sufficient.

Similarly, for P8, the issue was more towards understanding the culture of the Singapore healthcare system than it was about her role as an OR nurse. She expressed:

It helps me somehow because umm initially I did not know where to go because the OR in Singapore is pretty big.

Likewise for P8 who had experience as a nurse in other nursing specialties, he stated:

I am a person who have to be on ground so those information that they gave us was actually sufficient for me to function daily in the OR itself lah. But for me if I ahh it was sufficient for a beginner to start with.

However, P4, who had previous experience as an EN in the OR but recently achieved his RN qualification, pointed out that although the contents were satisfactory, he was still required to learn more on areas related to his new OR nurse role. He shared:

Can say sufficient but I still need to read up more on the medication that they use lah.

In contrast, for the two participants who had no experience as nurses, their recollections of the contents of their IPs were satisfactory to a certain extent. They recalled lessons related to their roles. However, they struggled in the actual work environment when it went out of context. Thus, they felt some knowledge and skills were gained outside the classroom. P1 recalled:

So on that part it was quite a struggle for...for me when I started out in the operating theatre because I didn't know how to achieve to position the patient, how are the positioning aids to use. Umm...but other than that, the umm, the scrubbing side was fine, just the circulating side was a bit of umm...lack of information.

While P1 explained:

But umm...they do teach the basic layout of the instruments but I think umm...scrub nurses you learn on the ground itself. Like learning how to identify the instruments that one you really have to learn on the ground.

The satisfaction of IP for nurses was a critical indicator of its impact on enhancing their knowledge and skills of their OR job roles. The descriptive data demonstrated that OR NJNs with experience as OR nurse found the contents satisfactory but expressed that their colleagues who were novice OR NJNs might struggle to comprehend some of the major OR nursing subjects delivered. On the contrary, novice OR NJNs were satisfied with their OR nursing IPs but felt that some matters could only be understood and achieved in the actual work environment.

RQ1 Theme 1 - Subtheme 6. Comparing of IP. Participants gathered mixed responses when asked to recall if they knew if their colleagues who had joined before had undergone the same IP as they had. Three participants shared that the IPs they experienced were the same. The rest of the participants indicated that their programmes differed from the previous batches. Most participants stated that their IPs differed from those they had experienced back in their home country or compared to programmes from other nursing units or from previous Singapore OR units they worked in. Nonetheless, it was an effective way to examine the quality of OR IPs. For P1, who compared her IP experience to the senior colleagues', she mentioned that she was the second batch to receive an IP. She conveyed:

Yeah. I think...I think they didn't had any programme at all. It's...ya. So we are actually the second batch they implement this programme this arr...6 months training programme. So...Umm obviously we are at the advantage because we are actually getting expose to all this that our seniors didn't get exposed to....

While P3, who was trained overseas, made his comparison with the IP he received back home. He pointed out that the IP he received in Singapore was more sophisticated but thorough. He described:

I think it's different because the programme here is more complex and much more detailed I should say.

Similarly, P8 shared that she noticed the IP she received in Singapore was more formal and was impressed by the ability of the current hospital she worked in to deliver an IP to all new employees. She mentioned:

... because I entered Singapore we are in a lot of batch.

So I could say that for sure more formal than my other work on how they manage to do their orientation for all the newcomers.

For P6, he made a comparison to the OR nursing IP experience he had in his previous OR unit in Singapore. He shared that in his last workplace, the IP was more laborious in their IP delivery as they had to complete many units. On the other hand, in his current unit, it was more casual because they knew of his experience as an OR nurse. He shared:

I can say that it is a bit different. I guess it was their approach on how they orient their new colleagues or new employees. Umm. When I started here. They know I had experience. Compared to my previous workplace where it was more tedious where I had to completed a lot of programmes.

P4, however, compared his IP experience to his colleagues from the ward. He said there was a significant difference in subject focus in their unit IPs because they were practising in different areas of nursing. He stated:

Yeah totally different lah. Because ahh other nurses learning is more on the ward base where as mine is in the operating room, operating theatre based lah. So they should, they will be a big difference lah.

However, when the researcher prompted him regarding the experience and asked him to recall the experience between him and his senior OR colleagues IP, he described it as mainly similar. He specified:

Umm some are almost the same lah.

When asked to compare IP experiences to senior colleagues, the collective response was multi-dimensional. Participants who were migrants were more inclined to make comparisons to IPs they received back home. In their view, the IPs delivered in Singapore were more thorough, organised, and formal. On the other hand, Singapore-trained OR NJN participants P2, P4, P5 and P7, who moved to a new OR unit in Singapore, compared their programmes to be the same. P1 was the only Singapore-trained participant who felt her programme was different because the hospital she worked in was still new. Thus, IPs

delivered were still a work in progress. RQ1 subtheme 6 appeared to provide a more comprehensive dialogue among participants regarding their experience of IP quality. Participants indicated that comparing IPs with previous workplaces or senior colleagues impacted the IP quality delivered in Singapore OR units. The impacts were positive, therefore showing that the quality of IP provided in Singapore was more effective in enhancing the knowledge and skills of OR NJNs.

RQ1 Theme 2. Skills and knowledge acquisition. Theme 2 emerged from the interview questions concerning participants' views of establishing skills and knowledge through their IPs that helped enhance their knowledge and skills in performing new job roles. These were categorised into three sub-themes: tools to attain skills and knowledge, learning exposure and learning initiative.

RQ1 Theme 2 - Subtheme 1. Tools to attain skills and knowledge. The tools to attain skills and knowledge were pivotal to the participants' nursing professional practice. It played a significant role in acquiring and developing their skills and expertise in OR nursing. For the participants in the study, the process to access such tools was first to be given an OR-specific IP that was separated from the general hospital-wide IP for general nurses and other employees. These specific IPs provided these nurses with the knowledge and skills required. For P5, she described when given the basic theory and practical tools for her job role, achieving competence in those basic areas was done with the method of discipline in practice. She described:

I mean the theory and practical wise of hand hygiene and gown up of glove and gowns were actually quite like a very basic for us. So it was drill into us during the orientation.

Another participant, P1, also specified the tools she received from her facilitators during her OR IP. It included basic OR nursing skills such as handling sharps and introducing basic instrumentation for surgical procedures. She stated:

...they thought us how to...wear a gown that's more on the practical side and they introduce to us the different sets that we have. Like for example the Ortho basic, GS basic and all. The names of the instruments. And um ya also instruments layout, things to take note of when we are handling sharps and all.

On the hand, two participants shared that they were given a booklet as a tool to gain the necessary skills and knowledge to achieve at their level. P2 described:

A checklist that they gave us that we had to complete...

P7 similarly shared:

They gave us a booklet full of list that I am required to sign with 3 or 6 months and submit it at the end of the timeframe.

P2 also shared that he was tools for him to function in his role. He shared:

you can function well ahh that was the good important thing because they emphasise on the policies and procedures that was important.

On the contrary, for P3, the tool for her to attain her OR nursing skills and knowledge was by pairing her with the team she was assigned. This helped her acquire the appropriate skills and knowledge for the discipline she would work in. She shared:

....that include pairing with an Ortho scrub scout...

In summary, the tools participants shared while attaining skills and knowledge were indispensable. Participants expressed that such tools provided them with access to information, enhanced their learning efficiency, simulated their actual clinical scenarios, facilitated collaboration and communication and supported their skill development. The choice of tools given to participants depended on the specific field of OR nursing and the

hospital where they worked. Additionally, the perceptions of the tools provided differed based on the experience level as a nurse and an OR nurse. Still, their role in the learning journey cannot be understated.

RQ1 Theme 2 – Subtheme 2. Learning exposure. Learning exposure was a crucial aspect of skills and knowledge acquisition for OR NJNs in the study. It involved gaining practical experience in their clinical settings, which complements their classroom knowledge. It helped nurses clarify the gaps between the two to make sense of it. Participants in the interviews shared a few different methods they were exposed to regarding their skills and expertise. It included learning on the ground, hearing about it, being given pointers, automating repetitive tasks and self-learning. P5 shared:

...they do teach the basic layout of the instruments but I think umm...scrub nurses you learn on the ground itself. Like learning how to identify the instruments that one you really have to learn on the ground.

Similarly, P1 shared:

I think the pointers that help like learning the basics like.. knowing the instruments' name.

Likewise, P3 expressed that the work hacks she was provided helped her in functioning with her daily work routines. She mentioned:

They really do share their experiences and how like like work hacks, how you were going to survive and how you were going to work things out. And they are very policy based on how you were going to troubleshoot somethings. So ya very informative and helpful.

For participants with nursing experience in OR units or other nursing specialities, their understanding of the learning exposure differed from that of novice OR nurses. P2

described his learning exposure during his OR nursing IP as sufficient for novice nurses, mainly because he knew basic OR nursing. He said:

...cause for me I am a person who have to be on ground so those information that they gave us was actually sufficient for me to function daily in the OR itself lah.
...it was sufficient for a beginner to start with.

However, P3 pointed out that too short of a learning exposure would not benefit the novice OR nurse. She said:

I think the information the orientation period is sufficient because I have experience.
But if you are a newbie. A week of orientation just just on your own is not sufficient.

Participants' responses regarding their learning exposure showed how learning was achieved during OR nursing IPs. They perceived learning as an ongoing process that sometimes happened away from the classroom or under the guidance of a mentor. By actively seeking opportunities when learning was exposed, the OR NJNs found it to benefit them when faced with similar situations, thus creating growth in their skills and knowledge of the job roles.

RQ1 Theme 2 - Subtheme 3. Learning initiative. As new nurses in a unit, the participants expressed that the learning initiative was essential to their skills and knowledge acquisition. Taking the initiative to learn and improve their skills led to a better experience when performing their job roles and increased their proficiency. P4 described he initiated his learning by self-reading or communicating with his team when asked by the researcher whether his IP provided him with sufficient knowledge and skills to prepare him for his job role. He described:

Can say sufficient but I still need to read up more on the medication that they use lah.
...I will try to communicate with the anaesthetist...

For P2, he identified the information he heard outside the classroom as a commodity that became second nature when he turned it into a habit. He mentioned:

....a skill that later on I I heard about that I needed to like get use to...

He also shared that he sought his learning needs when he was exposed to the clinical area. He stated:

....for me I am a person who have to be on ground so those information that they gave use was actually sufficient....

For P7, he took the initiative to access his learning in the clinical environment because he was not exposed to the information during his IP. He stated:

Because even though it was an orientation most of the things I learn on the job itself.

He also took initiative to understand his learning deficiencies by comparing them with his past experiences. He mentioned:

Even if the orientation was not enough for me I can relate to my past experience.

The individual initiative proved to be important when new to a clinical environment. As much as employers efforts to offer TSPs like OR nursing IPs, eventually, it would not be sufficient for nurses to gain all the knowledge and skills within a short time frame. Continuing to take advantage of learning opportunities when they arise makes learning more accessible. Moreover, although mentors could provide valuable insights to navigate new nurses in the unit, NJNs' self-initiative would help them stay informed and eliminate redundancy in their learning.

Research Question 2:

The questions in the qualitative interview guide helped gather responses from the participants for RQ2. Each participant spoke of their previous experiences and how their challenges impacted their ability to perform their job roles even with an OR unit-specific specialised nursing IP that was provided. The broad themes that emerged across all the data

sets were approached similarly by each participant; however, some participants had variations in the related sub-themes that collectively created the central theme.

RQ2 Theme 1. Adapting to a new clinical environment. Many factors could contribute to nurses' ability to adapt to their unique clinical setting. Adapting to a new clinical environment could be challenging, whether an individual has had experience in the profession or a novice. The participants in the study shared that one main factor contributing to their ability to adapt quickly to a new clinical environment was their previous exposure to the OR unit. Participants also shared that these factors contributed to their expectations in championing their job role. However, they faced challenges that impacted their ability to adapt to their new workplace. These were categorised into three sub-themes: immersing in a new work environment, tools to help function in a new clinical environment and resilience.

RQ2 Theme 1- Subtheme 1. Immersing in a new clinical environment. Immersing oneself in a new clinical environment could be exciting and challenging. Nurses, whether novice or experienced, transition differently when placed in a new setting or role. Participants in the study recalled their experiences when immersing themselves in their new roles and units. It was observed that the novice, internationally trained, and experienced locally trained nurses had different struggles. P1 recalled her struggles adapting to her new workplace during her IP. When sent to her clinical rotation, she shared how she found it challenging to identify the names of surgical instruments and understand her role because she was not given a definite job role during her IP. She recalled:

But umm...another thing that we notice is umm...running for instruments. Because umm...we are only thought on the basic instruments and not more like the...the discipline specific ones. Soo...it takes some time to know the instruments and the instruments name and know where they are kept at. And I know that it's quite a

limitation to go through during orientation, because for us umm...we didn't know which discipline we were going to.

Likewise, P2, an experienced nurse transitioning to the OR unit, shared that locating emergency equipment during crises posed the main challenge for him. He recalled:

I mean like ahh emergency cases where they needed emergency airway intubation, the where they stuff were kept ahh any like inaccessible items like I mean like the scope, or like anything.

For P8, the biggest challenge she faced was understanding the workplace culture and diversity. She mentioned:

*I think all about culture and diversity...
...because the OR in Singapore is pretty big. And the set-ups between Philippines and Singapore are...are they are so huge difference.*

On the contrary, P3, an internationally trained OR nurse, compared her challenges with the new work environment to her experiences back home. She mentioned that the fast-paced work environment was something she had to get used to. She described:

Umm. Challenges. Umm. Challenges. Yes! Because umm it is a very quick turn over time you I am not use to different systems when it comes to doing my role now. So that is one of the challenges I face when I was starting in this role is this hospital.

Immersing oneself in a new clinical environment could be challenging. As identified by participants in the study, adapting themselves to their new roles and workplaces could take time. Nonetheless, they stayed committed to their learning journey as, over time, they became more comfortable, confident and accustomed to their workplace culture and roles.

RQ2 Theme 1- Subtheme 2. Tools to help function in a new clinical environment.

Providing tools for nurses new to a workplace setting plays a crucial role in their workplace adaption. Similar to the phenomenon of the tools provided for knowledge and skills

acquisition, the phenomenon of the tools to help NJNs function in a new clinical environment was more related to how they adapt to the culture of their workplace and the people in it. The tools provided for them, or for some who had them from past experiences, helped the nurses in the study overcome the challenges they had that might impact their ability to adapt to their new workplace. For P6, he felt his experience from his previous OR units helped prepare him to adapt to his new workplace. He said:

I think it actually depends because for me I have experience in different theatres and different work place and umm I think I am already like well-prepared for the environment compared to the new.

Similarly, for P7, he shared that it was not difficult for him to adapt to his new unit because he has experience as an OR nurse and used it to his advantage. He said:

... to me it is fine because I have already been in the theatre environment for 11 years. So it was not a problem for me. Even if the orientation was not enough for me I can relate to my past experience.

On the other hand, P2 explained that the clinical rotation provided for him during his IP helped him understand the different work areas and their cultures. He also added that he navigated his queries about the challenges that needed clarification with the senior in the areas where he was a partner. He shared:

they had to tag us in someone ah and rotate us ahh in each areas lah with a preceptor which I feel was sufficient because at least we can refer to senior which helped us if we had any queries.

The tools provided for NJNs in the OR units have shown to be helpful for the nurses in the study. Although nurses initially faced challenges with culture competency, especially for overseas trained nurses, familiarising themselves with the Singapore nursing work culture and people over time reduces those issues. It was the result of the impacts of the OR IPs on

them as the contents shared helped them understand better how Singapore's healthcare system, workplace and people function.

RQ2 Theme 1- Subtheme 3. Resilience. Resilience in nursing is vital, especially when nurses are new to their job or department. Adapting has been seen to be challenging, as shared by the participants in the study. The participants shared their struggles, such as the unfamiliarity with the workplace culture, people, job roles, and patients. Nonetheless, it was their resilience to succeed in their roles that made their experience better. P8 expressed her experience of being resilient with her work despite not facing as many challenges with her job role as she had experienced. Regarding work preparedness, she recalled that it did not matter if she was reprimanded for not knowing her work because she could not retain the information. She explained that one has to overcome those challenges when the researcher confirmed through member-checking. She described:

I just do it. Because there is not any other way whether you are scolded by surgeon or you are complimented by your work it doesn't matter as long as it retains in your mind. Umm so whether you are prepared or not you just have to do it.

Similarly, for P7, his opinion was that one could be provided with as much information as possible during IPs. However, when faced with challenges, they must learn to adapt to those situations by learning on the job. He stated:

I mean in my opinion you can give as much as you want in an orientation but at the end of the day you still have to ask your colleagues and learn on the job.

For P4, he built relationships with his team members when the opportunity arose, knowing that most knowledge and skills outside the IPs have to be acquired through self-initiation. He shared:

...after that ahh got the hands on ah with the anaesthetist together with my with my SSN.

... most of it ahh you have to learn it by yourself lah.

Building resilience as an NJN requires personal effort. Although it might require nurses to pass over many hurdles, it was an essential skill that served them well when faced with challenges at work, as shared by the participants in the study. It was observed in the interviews that embracing the challenges they faced, seeking support when needed and building relationships allowed growth in their profession..

RQ2 Theme 2. Quality of IP. Similar to how the quality of IP helped answer RQ1, participants' responses gathered that challenges related to the quality of IP were because when information was overloaded on them, it decreased the retention of learning. Moreover, gaps in the IP received affected the programme's quality; however, participants noted that these were opportunities that their department could improve on and gather as much helpful information as they could during the IP that could help them in their roles. The theme was divided into three sub-themes: satisfaction of IP delivery, outcome of IP in work preparedness, and ability to grasp learning.

RQ2 Theme 2- Sub-theme 1. Satisfaction of IP delivery. The satisfaction of IP delivery was vital for NJNs as it would likely engage them in their professional development and allow them to seek opportunities to advance their career. For participants in the study, nursing was not just a job; thus, the satisfaction of the IPs delivered to them could help them adapt to their new roles and promote their mental health. Additionally, it could encourage a positive work environment when their morale was overall high, thus improving their work productivity and efficiency. For P1, she described her experience with her IP as helpful, although some aspects of the IP delivery lacked information. She described:

I think the rest are ok. It's just mainly on umm the circulating part and all.

It really did help us a lot in that sense compared to if they just throw us out...

P3, on the other hand, expressed that she was concerned during her IP that the contents would not be sufficient for her because she practised overseas. She also added that the timeframe of her OR IP could have been extended to another week to gain more knowledge about her unit and job role. She mentioned:

I think the main, my concern is because I am a. I came from overseas experience. So I have done undergone the proper in-service of each system of they that I have to work to.

I think the time frame and the scopes of what to be focus on the orientation programme. The time and the duration like if like if instead of having it for a week, having it for another week. And have they much focus on what the nurses are working to or working with.

For P5, she elucidated that she was somewhat satisfied with the IP even though there were still gaps she felt could be bridged. However, she thought the OR unit IP design had bridged those gaps as much as possible, as basic teachings were designed to be fulfilled during the IP period. She highlighted:

But gaps I think they already close up on as much as they could already. But I would say that scrub is kindna of a big this so...it's like hard to teach step by step so they kindna try to drill you in on the basics. So I think that's quite fine.

In summary, the satisfaction of OR NJNs with their OR IPs played an essential aspect of investment in their profession. When combined, the parts of each participant's experiences with the satisfaction of their IP delivery highlighted work engagement after completing their IP. Although there were some aspects of their IP that they found to be none satisfactory, overall, they were somewhat satisfied with the efforts put in by their organisation to at least provide them with basic OR nursing knowledge.

RQ2 Theme 2- Sub-theme 2. Outcome of IP in work preparedness. The effect of OR nursing IPs on work preparedness could significantly impact the success and satisfaction of NJNs. As discussed in RQ2 theme 2 sub-theme 1, NJN's satisfaction with the OR IP delivered could result in better work engagement. Nursing IPs' goals have been outlined to ensure the programmes ready NJNs for their roles and responsibilities. The IPs of OR NJNs in the study were designed to prepare them for assigned roles in their OR units. These included providing them with the basic knowledge of OR nursing. However, the impact of the IPs was limited to these areas. When faced with more advanced OR practices, the participants highlighted that they struggled to function competently. P5 raised that one issue of her OR IP was that the classroom practicals did not deliver the same outcome in the clinical practice area. She described:

But the one thing I dislike is that, you don't really have the kinda of real feeling that you get when you are actually scrubbing with the surgeon.

Likewise, P3 expressed that she was expected to know her job well after undergoing her IP, and that expectation was magnified when her unit assumed she could function independently. She mentioned:

What I dislike is the quick turn over they are expecting you to know everything after that period that you can do it on your own.

The rest of the participants ($n = 6$) shared that although the outcome of their OR IPs was satisfactory, the runtimes were often draggy. Thus, it made them unable to retain the entire content of the lessons. P4 mentioned:

Sometimes it takes the whole day.

P8 similarly pointed out that the outcome of her IP did not entirely prepare her for her job role because the contents only helped her visualise the clinical situation, which differed when she went into the actual clinical area. She said:

I cannot say it totally yes. Maybe, umm it will help me to just visualize what will be the situation but it will not prepare me to the job.

P2, he shared that the information that was not relevant prolonged the IP runtime, thus spanning his attention span to gain information that could have been useful for his job role.

He shared:

The the not so important urr urr the not what ahh I didn't like was the was a bit too long.

The overall outcome of OR IPs could impact the work preparedness and the quality of care provided by the NJNs. The participants in the study shared that although they had a smooth transition after their IPs with the basic OR knowledge and skills, the lengthy runtime during their IP session could be better spent on providing them with valuable information that would prepare them for the more advanced OR practice.

RQ2 Theme 2- Sub-theme 3. Ability to grasp learning. The ability to grasp learning during the beginning of one's professional career has been shown to impact one's work performance. For OR NJNs, the ability to grasp and apply new learning affects how they would potentially contribute to the surgical team. The study recognised several factors that influenced the ability of OR NJNs in Singapore to grasp learning during their OR nursing IPs. These included experience as an OR nurse, the delivery of the OR IP, resources, expert guidance and collaboration. Nevertheless, there were still challenges faced by the OR NJNs in the study. P1 recalled her experience of grasping the information during her IP was hindered because they were provided with too much content. She said it overwhelmed her, thus confusing her on what applied to her role in the OR. She described:

...like when we learn everything usually quite overwhelming when urmm somethings that we learn is not applicable to us. Is not the things that our specific discipline items we did not learn then because it was too generalised.

Similarly, P2 mentioned that due to the overloading of information during the theoretical aspect of his IP, his ability to focus on what was shared was reduced as he became mentally exhausted. He described:

Err...ya ahh ya so I felt after like a few hours my attention span started to drop...

On the contrary, P6, one of the five experienced OR nurses, shared that his ability to grasp learning during his IP was not challenging as he could adapt to his new workplace by applying his knowledge as an OR nurse in previous organisations. However, he felt the challenge for NGNs would be conspicuous because they did not possess the basic nursing skills compared to experienced nurses. P6 elucidated:

Like a new grad. I think they need to have more training I guess because it is different for them when they actually on the field. They don't have that much practical skills in giving care and giving services in terms of umm in nursing.

P7 similarly pointed out:

Even if the orientation was not enough for me I can relate to my past experience. But if it is for a fresh graduate it wouldn't be good.

In summary, the descriptive data identified the factors that affected and helped OR NJNs in the study with their ability to grasp learning during their IP. Factors such as experience, information overloading, and reduced attention were shown to have helped or hindered them. Thus, as the nurses in the study shared, they needed to explore their learning outside the learning circle of their IPs.

RQ2 Theme 3. Resource persons during IP. Resource persons during OR nursing IPs played a significant role in providing expertise, guidance and training for NJNs in the OR unit. This group of nurses helped the OR NJNs acclimate to their roles and responsibilities in the study. These were categorised into two sub-themes: quality of the resource person and availability of the resource person.

RQ2 Theme 3- Sub-theme 1. Quality of the resource person. The quality of the resource person during nursing IPs has been proven to be crucial for the success and effectiveness of the programme. The study participants outlined that the resource person's quality depended on the area they were in during their IP. These factors rendered their ability to perform and understand their job roles. P1 shared that the facilitator of her IP was well-informed in OR nursing and tried to clear as many doubts as possible. She described:

I think they are quite well verse in their area and they are explain...rather well and umm...they took...they took the time to answer our questions and they really went down to each and every bit that is important to know.

However, during her IP clinical rotation, the seniors in the clinical area were reluctant to teach the NJNs for fear of overloading them with information irrelevant to their role and unclear what should be taught. She explained:

Because they know that we might not be going to their discipline and if they teach us too much it will be too much information for us. Plus if, they don't teach us enough, we don't know exactly what is going on.

On the contrary, the rest of the participants had many praises about the quality of the resource persons. They found their resource persons during their IP were well-versed in OR nursing, thus easing some of the challenges they had with their ability to perform their job roles at the beginning stages of joining their new OR unit. P3 and P8 described their facilitators as informative and helpful when asked how they found their facilitators during their IPs. P8 shared:

She is informative because she is the one that is always talking and of course she does her job as an educator. She is kind and umm how can I say...she is warmth educator.

P6 similarly mentioned the resource person was very thorough when explaining the different OR nurse job roles and found them friendly. She said:

They were specific on your job description. Umm I find that they approach was far more friendlier compared to my previous workplace.

The quality of resource persons in the OR nursing IPs was highlighted by participants to affect the experience of their IP, thus affecting their ability to perform their roles. The experiences of the NJNs in the study shaped their knowledge, skills, and attitudes to their new OR unit.

RQ2 Theme 3- Sub-theme 2. Availability of the resource person. The availability of resource persons during nursing IPs could vary depending on the programme type and organisation. In the study, two participants highlighted that human resources affected the availability of the resource person. Nonetheless, it was essential for participants during their IP to have the presence of an expert OR nurse presence during their transitional period. P3 pointed out that on some days during her induction to her unit, the NJNs were not accommodated because the clinical environment was busy; thus, her department did not have a designated person to guide them. She stated:

There was a time that we are doing orientation and everyone was just so busy. So we were like not really umm accommodated. When we are doing our orientation because it's a busy it's a busy period when they did they orientation with us. So we did just say hi and hello then get out of that.

However, she later explained that after her initial introduction to her unit was done, she was handed over to the senior of her team. She explained:

....the clinical educator that time she had handed over me to the senior orthopaedics scrub scout team that time. So that's start my orthopaedics exposure in this hospital.

P6 similarly shared that he did not have a proper resource person to guide him like the one he had in his previous OR unit. Although he had a clinical instructor to induct the NJNs

for their OR nursing IP, there was no preceptor to guide them in the clinical environment. He mentioned:

Umm actually, based on my training that I had in my previous workplace I had a preceptor to guide me, encourage me and help me improve my skills as compared to what I have recently gone through...

In summary, to ensure the availability of resource persons during OR nursing IPs, OR units need to plan to ensure that NJNs would be accommodated. These might include less busy days for clinical rotation and assigning preceptors before the arrival of NJNs, as highlighted by the participants.

RQ2 Theme 4. Challenges with skills and knowledge acquisition. Acquiring professional skills and knowledge is essential to function as a nurse. As noted by the participants interviewed in the study, learning exposure, retention, and reflection were crucial factors that helped them attain the professional skills and knowledge for functioning efficiently upon completing their IP. However, nurses faced some challenges when attempting to achieve this. As informed by previous themes, factors such as human resources and IP quality all contributed to these challenges. These were categorised into three sub-themes: information overloading, classroom versus reality, and accessibility to OR nursing skills and knowledge.

RQ2 Theme 4- Subtheme 1. Information overloading. Overloading of information during nursing IPs could be counterproductive if not managed effectively. It has been a common problem observed during nursing IPs to give as many details as possible, bombarding NJNs with a substantial amount of content that might not be absorbed. In the study, the participants shared that the chunk of information became unmanageable to register, thus lowering their learning retention. Furthermore, it caused them mental fatigue. P1, P2 and

P8 shared that the information overloaded them during their IP and reduced their ability to grasp learning. P1 mentioned:

Instead we are taking in as much information as we can but that's that's only so much you can take.

...if they teach us too much it will be too much information for us.

P2 similarly shared:

so kind of like a was a bit too much information at that point of time...

For P8, she felt there was no point in overloading content in one session if the participants could not absorb most of the information. She elucidated:

...we were just sitting there and we're trying to absorb all the information the educator is telling to us. And the down side is that you cannot absorb everything.

Because I mean if you are not so familiar to a place and not familiar to everything that is spoken to you. There is not many much retention.

On the contrary, the rest of the participants ($n = 5$) shared that the information shared during their IPs was sufficient for them but could be insufficient for novice nurses, as shared in previous sub-themes. For example, P3 shared:

But if you are a newbie. A week of orientation just just on your own is not sufficient.

Similarly, P6 shared:

I think I am already like well-prepared for the environment compared to the new. Like a new grad. I think they need to have more training I guess because it is different for them when they actually on the field...

In summary, as observed by participants' experiences in the study, the information delivered during OR nursing IPs in Singapore should be moderated as participants' experiences highlighted an overloading and under-coverage of contents. Organisations should

ensure that the information shared would be absorbed by the NJNs and confirm they could apply the IP knowledge effectively in clinical settings.

RQ2 Theme 4- Subtheme 2. Classroom versus reality. Transitioning from classroom sessions to the clinical setting during nursing IPs can be challenging, especially for nurses new to an organisation. While the purpose of OR nursing IPs is to provide nurses with a strong foundation of OR nursing theory and clinical skills, the reality of the clinical work environment could be relatively different. Participants in the study shared how these issues led to challenges that affected them in performing their job roles as the gaps between classroom sessions differed when they went into the actual clinical settings. P1 recalled that although her basic knowledge and skills as a scrub scout nurse were well explained, it did not translate when she went into the clinical settings, and she found out that some roles were performed by theatre support staff. She mentioned:

But on the other end it's like somethings that they...they really thought us was how to position the patient, the positioning aids. I understand that its umm...mainly done by OTTs like the operating technicians right. And then sometimes it requires us nurses the circulating nurse to actually be the one who help to position the patients. So on that part it was quite a struggle for...for me when I started out in the operating theatre because I didn't know how to achieve to position the patient, how are the positioning aids to use.

For P2, he shared that topics critical for anaesthetics nurse to function in their role, such as attending to emergency airway cases, were only briefly discussed. He mentioned that it would have been helpful during the IP to have touched more on the topic so that nurses could react to those situations better in the actual clinical settings. He stated:

I mean like ahh emergency cases where they needed emergency airway intubation, the where they stuff were kept ahh any like inaccessible items like I mean like the scope,

or like anything. So that was to me a bit umm umm it wasn't really touched on but it was just briefly said...

For P7, he felt that although the topics for basic OR nursing were covered sufficiently during his IP, that information could only be translated with actual hands-on in the clinical settings. He said:

Because even though it was an orientation most of the things I learn on the job itself, like how to set-up the documentation and all those stuff. I don't do it during the orientation itself. I do it when I am working with them and you know someone who can guide me and those things.

P8 similarly shared her experience, stating that the classroom experience could not be compared to actual clinical experience. She felt:

I think if you said it help you prepare, I don't think so because it will develop in yourself eventually. Because you cannot say you are prepared unless you are there in that situation.

In summary, bridging the gaps between the classroom experiences and actual clinical settings could be met with some confronting situations for OR NJNs. Nonetheless, as observed by the different experiences shared by the participants in the study, the willingness to bridge those gaps has helped nurses overcome the challenges that were the impacts of their IPs.

RQ2 Theme 4- Subtheme 3. Accessibility to OR nursing skills and knowledge. The accessibility for OR nurses to acquire the knowledge and skills of OR nursing during their IP was essential for the professional practice of nurses in the study. It was the foundation for them to provide safe patient care. The participants in the study shared a kaleidoscope of methods they could have used to access the knowledge and skills they needed to function in their job roles despite the overloading of information and reality shock they experienced

during their IPs. These included sharing sessions and more time spent on clinical rotation instead of classroom theory sessions. P8 shared that if she could change one aspect of the IP she underwent, it would allow NJNs to interact more during the IPs instead of the facilitators doing all the interaction. She described:

If there were something I could change. Maybe umm provide more interaction, provide more umm ya I think more like interactive so it won't be so boring and also give other people to gather their information to share what they think about the programme and they also share what other culture they have in their previous hospital.

P2 and P4 similarly shared that sharing sessions such as hands-on practice sessions would have been better to bridge the theory-practice gaps. They shared:

Maybe include a practical session where ah was more like umm participant based where they could get the crowd to actually like repeat ahh not repeat ahh I mean like to...umm practice back what they they understood from the positive like reflect so that I mean like like for me it was a bit too much information ahh ahh I I am more practical. (P2)

Umm...maybe more hands on ah because the one I attended is more a lot of theory so... a bit more hands on is better. (P4)

For P1, she stated that instead of consuming time explaining aspects of the role that they were still ambiguous about during their IP, the unit should have given them their position so that they could gather the appropriate information to help connect it with their role functions. She mentioned:

Unlike us who, went through a 6 months training without knowing our discipline. Ya....so right now they will train for 3 months, and then they will know their discipline and then the other 3 months they would focus on their discipline. So, I think for the

juniors is quite helpful because umm...it is not too overwhelming because they can focus on what they should actually focus on and not getting bits and pieces from different parts of the disciplines.

P3 similarly shared that the timeframe of her IP could have been extended so that essential and relevant contents of her job functions could have been explained and emphasised. She shared:

I think the time frame and the scopes of what to be focus on the orientation programme. The time and the duration like if like if instead of having it for a week, having it for another week. And have they much focus on what the nurses are working to or working with.

P8 similarly shared her experience, stating that the classroom experience could not be compared to actual clinical experience. She felt:

I think if you said it help you prepare, I don't think so because it will develop in yourself eventually. Because you cannot say you are prepared unless you are there in that situation.

For P6 and P7, they felt that a proper mentorship and preceptorship programme would have allowed them access to the knowledge and skills required to function in their OR nursing roles, especially for novice OR nurses and would have benefited the OR NJNs if the IPs were run systematically. P6 shared:

Umm actually, based on my training that I had in my previous workplace I had a preceptor to guide me, encourage me and help me improve my skills as compared to what I have recently gone through where we have a new grad where they just throw them on the field and let them learn from their own mistakes. So I think that is one thing I suggest to have a strong preceptorship programme to nurture new nurses.

While P7 shared:

I find it in my current workplace orientation is not really systematic. I mean it is done by one of the CI but it is not very systematic unlike my previous workplace.

In summary, incorporating strategies to ensure OR NJNs could access appropriate knowledge and skills of their job functions would enhance their ability to function in their roles. Ultimately, as participants shared, it would help nurture them in the OR profession and contribute to patient care.

Evaluation of Findings

The explanatory mixed methods design study aimed to explore the impacts of perioperative nursing IPs on OR unit nurses in Singapore with their transition to practice and ability to perform job roles in a new clinical environment. In addition, the study was relevant because it addressed the gaps in OR nursing research in Singapore that have impacted OR nurses with IPs' lack of acknowledgements. Using two self-developed instrument tools developed by the researcher in the study, the researcher was able to explore the phenomenon of the study guided by the following research questions and hypotheses:

- RQ1.** To what extent did having an OR unit-specific specialised nursing IP enhanced OR unit nurses' knowledge and skills in performing new job roles?
- RQ2.** To what extent did the challenges NJNs in Singapore OR face with the OR unit-specific specialised nursing IP affected their ability to perform their roles?
- H1₀.** Having an OR unit-specific specialised nursing IP would not result in the enhancement of OR NJNs in Singapore's knowledge and skills in performing their new job roles.
- H1_a.** Having an OR unit-specific specialised nursing IP would result in the enhancement of OR NJNs in Singapore's knowledge and skills in performing their new job roles
- H2₀.** OR unit-specific specialised nursing IPs did not affect did not affect Singapore OR NJNs' challenges with their ability to perform their roles.

H2a. OR unit-specific specialised nursing IPs affected the challenges Singapore OR NJNs faced with their ability to perform their roles.

This section will briefly report the findings of this study and present the results in light of the theory and conceptual framework discussed in the earlier chapters. The author would first report the quantitative survey findings, followed by the qualitative study. A more detailed discussion of the evaluation of findings will be discussed in Chapter 5.

Quantitative study findings

Research Question 1

Frequencies, mean, median and standard deviation were calculated to answer this research question. First, two statistical tests were calculated, namely the independent-sample T-test, to compare the means between OR NJNs who received an IP and those who did not. Secondly, a Spearman's rank order correlation test was performed to examine the relationship between OR NJNs' perceived knowledge and skills in performing job roles and putting theory into practice after undergoing their specialised IP. OR NJNs in the survey study generally respond, in relationship to RQ1, based on the different factors based on the questionnaires asked.

Satisfaction level of OP content coverage. 84.6% of OR NJNs in the survey study agreed that the content covered for their OP was satisfactory. Although the OP provided for nurses was separated from the IP, as shared earlier in the study, the responses suggested that the new work environment programme generally received a highly positive reception as the job role remained unknown. It was because OPs generally provided new employees with an overview of their organisational structure and the company's history. Such programmes generally ran during the first few days of employment, resulting in a low-impact factor that might not affect the OR NJNs' knowledge and skills in performing new job roles. The mean

was 2.11, with a standard deviation of .55 and a median of 2. In other words, most NJNs in the study agreed that the content covered for their OP was satisfactory.

Challenges faced after IP due to lack of technical skills exposure. 60.4% of OR NJNs in the study identified that challenges faced after undergoing their IP impacted their ability to function in their job role after receiving an IP. On the contrary, 26.4% disagreed that it acted as a factor that impacted their ability to perform in their job role. The responses might be a result of the demographics of respondents. These might include age, years of nurse experience, education level and job title. Thus, the percentage of NJNs in the study disagreed that the lack of technical skills exposure was a factor after their IP that impacted their ability to function in their job role, which might be relative to their background in the nursing profession and the OR unit. The mean value presented was 2.64, with a standard deviation of .89 and a median of 2. In other words, the lack of technical skills exposure during IPs presented challenges for OR NJNs in the study after their IPs.

Challenges putting theory and skills together after IP based on level of nursing. NJNs in the study responded positively to the challenges of putting theory and skills together after undergoing their IP. 51.6% of NJNs disagreed that it was a factor that impacted their ability to function in their job role, while 34.1% agreed. Similarly to the previous element, NJNs responded to this statement based on their level of nursing. Thus, their response to the factor was less critical due to expectations that might be set upon them depending on their level of nursing and OR nursing experience.

Additionally, 4.4% strongly disagreed that it was a factor, while 1.1% strongly agreed with the statement. The mean value presented was 3.21, with a standard deviation of 1.1 and a median of 4. In other words, based on their nursing level, most nurses in the study disagreed that putting theory and skills together after their IPs was a challenge.

Challenges after IP as content was not sufficient to function in the role. Most OR nurses in the study agreed that the insufficiency of topic coverage impacted their ability to function in their new job roles. 59.3% of NJN respondents agreed with the statement, compared to 20.4% who disagreed. The mean value was 2.54, with a standard deviation of .98 and a median of 2. By explanation, insufficient content coverage during IPs was agreed upon to impact OR NJNs in the study with their job function.

Faced challenges understanding concepts and seeking clarification DURING IP. Challenges in helping understand concepts and seeking clarification of topics covered during their IPs were an issue for most OR NJNs in the study. 50.5% of nurses agreed they faced challenges understanding concepts and seeking clarification during their IP. 12.1% of NJNs were neutral regarding the statement. On the contrary, 35.2% of NJNs disagreed that the statement was a challenge that affected them. The mean value was 2.79, with a standard deviation of .98 and a median of 2. In plain, OR NJNs in the study were likely to agree that helping understand concepts and seeking clarification of topics covered during their IPs were faced with challenges.

Faced challenges understanding concepts and seeking clarification AFTER IP. After undergoing IPs, OR NJNs in the study faced more challenges in helping understand and seeking clarification on topics covered during their IPs. 7.7% of NJNs in the survey strongly agreed with the statement, while 47.3% agreed. 11.0% were neutral regarding the statement, while 31.9% disagreed that helping understand concepts and seeking clarifications on topics covered during their IPs after undergoing such programmes was challenging. The mean value presented was 2.63, with a standard deviation of 1.1 and a median of 2. In other words, challenges in helping understand and seeking clarification on topics covered during their IPs were agreed upon to be encountered by most OR NJNs in the study after undergoing their IPs.

Challenges faced reaching competence level during probation due to lack of resources. Availability of resources was essential during nurses' probation period as it helped them reach their competence level. The majority of nurses identified the factor as a challenge to them. 60.4% agreed that it was for them to reach their competence level based on their nursing level due to the lack of resources provided during their IPs. Another 5.5% of nurses strongly agreed with the statement.

On the contrary, 13.2% of NJNs were neutral to the statement, while 18.7% disagreed and another 1.1% strongly disagreed. The mean value was 2.46, with a standard deviation of .95 and a median of 2. By way of explanation, most OR NJNs in the study agreed that reaching a competence level based on their nursing level was challenging due to the lack of resources provided during their IPs.

Challenges with confidence due to lack of skills and knowledge received in IP. Having confidence in performing a job role is essential in any profession. In the survey study, 56.0% of NJNs agreed with the statement, and another 1.1% strongly agreed. In other words, insufficient skills and knowledge during IPs affected NJNs' confidence. On the other hand, 14.3% were neutral regarding the statement. In comparison, 25.3% disagreed, and 1.1% strongly disagreed—the mean value presented was 2.63, with a standard deviation of .95 and a median of 2. In plain, OR NJNs in the study mainly agreed that they faced challenges with their confidence due to the lack of skills and knowledge received in their IPs.

Next, the Independent T-test was performed to compare the effect of specialised OR IPs on two different groups of NJNs. These included NJNs who did not receive specialised OR IPs and those who did. It was obtained by the dependent variable derived from survey question 19. In addition, two independent variables were used to help answer RQ1: survey question 27 and survey question 29. Firstly, 85 OR NJNs were identified as having received a specialised OR IP compared to six participants who did not receive a specialised OR IP.

Secondly, the test showed no significant difference in the effect of specialised OR IPs on the two groups of NJNs in terms of putting knowledge into practice after undergoing a specialised induction programme. Similarly, the test showed no significant difference in their ability to put theory into practice based on their OR nursing level. It suggested that OR NJNs faced challenges that impacted their job roles regardless of having or not having an IP.

Lastly, to further help answer RQ1, a Spearman's rank-order correlation coefficient was performed to examine the relationship between OR NJNs perceived knowledge and skills received in performing job roles (Q27) and putting theory in practice (Q29) after undergoing their specialised IP. A very weak positive correlation and no statistical significance between OR NJNs' perceived knowledge and skills received in performing job roles (Q27) and putting theory in practice (Q29) after undergoing their specialised IP were presented in the results.

Research Question 2

To answer RQ2, simple and multiple regression was executed to determine the relationships between the predictor variables, Q26 to Q37 with Q38. Two different analytical test methods were required because some respondents selected N.A. for some statements. Thus, measurements of analyses only included respondents who had experience with the statement asked. The multiple regression was executed for Q38 based on Q26, Q28, Q29, Q30, Q31, Q32, Q33 and Q36.

Firstly, the results presented a significant and strong positive correlation between how well OR NJN facilitators guided them during their IPs (Q31) and the overall helpfulness of IP in preparing for job competence (Q38). It suggested that as guidance from OR facilitators increased, so did IP's general helpfulness in preparing for job competence. Secondly, the results presented a significant but moderate negative correlation between challenges faced with adaptation after IP due to lack of time to transition (Q30), challenges faced after IP as

content was not sufficient to function in the role (Q32), and challenges faced to reach competence level during probation due to lack of resources (Q36) with overall helpfulness of IP in preparing for job competence (Q38). It suggested some noticeable correlation among variables Q30, Q32 and Q36 with Q38; however, it did not imply their causation. Lastly, identified as a team member after IP (Q28) and challenges faced with putting theory and skills together after IP based on level of nursing (Q29) presented no relationships with Q38. However, in summary, the regression results of 10 predictors only showed that Q38 significantly predicted only Q31 and Q32.

Subsequently, the simple regression analysis results showed a significant but weak negative correlation between the sufficient time to reach competency before confirmation of role (Q35) and Q38. Similarly, a significant but weak negative linear relationship between facing challenges in understanding concepts and seeking clarification after IP (Q34) and Q38 were identified. It suggested that as Q34 and Q35 increased, however, Q38 decreased; thus, the relationships were unreliable. Lastly, a significant but moderate negative linear relationship was identified between challenges faced with confidence due to lack of skills and knowledge reached in IP (Q37) and Q38. It suggested some noticeable correlation between Q37 and Q38 but did not imply their causation. Overall, the regression results showed that Q38 significantly predicted only Q35 and Q37. It suggested that as Q35 and Q37 changed, so did Q38.

Next, the Mann-Whitney *U* Test showed challenges that impacted Singapore OR NJNs' ability to perform their job roles were not influenced by whether they received a specialised OR IP. Lastly, Spearman's rank-order correlation run to examine the relationship between Q33 and Q34 revealed a weak positive correlation and statistical significance. It suggested that although both variables tend to go up in response to one another, the relationship was not very strong. Overall, the inferential analyses indicated that, to a more

significant extent, OR unit-specific specialised nursing IP did influence the challenges NJNs in Singapore OR faced with their ability to perform their roles.

Hypotheses

To address the study's hypotheses, Spearman's rank-order correlation was run to examine the relationship between Q26 to Q39. Firstly, the results indicated a strong positive correlation and statistical significance between Q30 and Q32, Q30 and Q36, Q31 and Q38, and Q32 and Q36. The results suggested that as lack of adaptation time increased, so did insufficient topic coverage during IP and challenges in reaching competence level due to lack of time given during probation. Similarly, as facilitator guidance grew, so did IP's overall helpfulness in job role preparation. Also, as insufficient topic coverage during IP increased, so did challenges in reaching competence level due to lack of time given during probation. On the other hand, the results indicated a strong negative correlation and statistical significance between Q27 and Q38. It suggested that when the lack of receiving the necessary and sufficient technical skills for the respondent's role at their level increased, the overall helpfulness in job role preparation after IP decreased and vice-versa.

Secondly, the results indicated a moderate positive correlation and statistical significance between Q26 and Q28, Q34 and Q37, and Q38 and Q39. It suggested that team acknowledgement also increased when an adequate explanation of job roles during IP increased. Similarly, as the overall helpfulness of IP in job role preparation increased, so did overall job role suitability after undergoing IP. In contrast, there were moderate negative correlation and statistical significance in Q30 and Q31, Q30 and Q38, Q30 and Q39, Q32 and Q38, Q31 and Q36, Q35 and Q38, Q36 and Q38, and Q37 and Q38. The results suggested that as one variable increased, the other decreased. However, it did not present a cause-and-effect relationship between the variables but, indeed, a noticeable one. For example, as

challenges in reaching competence level due to lack of time given during probation increased, the IP was helpful in job role preparation after IP decreased and vice-versa.

Lastly, Spearman's rank-order correlation results indicated a weak negative correlation and statistical significance between Q27 and Q39 and Q35 and Q39. The results suggested that when one variable increased, the other decreased. For example, when provided sufficient time to reach competence level before role confirmation increased, the overall job role suitability after undergoing IP decreased and vice-versa. However, despite the existence of a relationship, it existed unreliably.

Qualitative Study Findings

The purpose of the qualitative study was to provide insights and understanding of Singapore OR NJNs' perception of their IPs' impacts on their professional practice in more depth. Eight interviews were guided by a self-developed qualitative interview questionnaire guide with a research journal to aid the researcher in noting any non-verbal cues during the interviews. The problem was not known if the challenges faced by Singapore OR NJNs after undergoing their IPs impact them in their professional practice. Moreover, it was not known what factors contributed to these challenges existed. The study's primary findings revealed the factors that contributed to the challenges faced by Singapore OR NJNs after undergoing the IPs that impacted them in their professional practice were clustered into six main themes.

The themes were:

- RQ1 Theme 1. Quality of IP.
- RQ1 Theme 2. Skills and knowledge acquisition.
- RQ2 Theme 1. Adapting to a new clinical environment.
- RQ2 Theme 2. Quality of IP.
- RQ 2 Theme 3. Resource person during IP.
- RQ2 Theme 4. Challenges with skills and knowledge acquisition.

RQ1 Theme 1 - Quality of IP

The interviewees' responses showed that the quality of IP had a pivotal role in enhancing their knowledge and skills in performing new job roles. Except for one participant, all other interviewees had undergone some form of an IP. Issues associated with and contributing to the quality of their IPs were the availability, length, and delivery of the IPs, topics coverage, the satisfaction of IP in preparing them for their job roles and comparing the IPs they underwent to previous and current new colleagues.

The availability of IP played a role in introducing OR NJNs and their assigned roles to the unit. It increased awareness of the primary OR nursing practice and how the OR unit functioned primarily for the novice OR nurse. However, the OR NJNs in the study acknowledged the importance of having well-informed facilitators to deliver these topics during their IPs. The information provided by some facilitators was essential to these nurses to help them later survive on the ground, even for nurses who had previous experience because every unit's practices and culture differed to a certain extent. When nurses were more informed about survival in their professional roles, they could build resilience and take the vital tools for professional practice survival from the IP. In addition to the availability and delivery of IPs, participants in the study noted that the length of IPs provided might be insignificant if the topics covered were insufficient or not OR nursing-related.

Moreover, it served no purpose if they could not retain the learning. Thus, it led to insufficient professional performance readiness. Lastly, comparing past and current IPs with the IPs undergone helped give an overview of what could have been done better and reflected on how their IPs affect their current professional status. Nurses with experience shared that this was a tool to enhance their ability to perform their job roles in their existing unit.

RQ1 Theme 2 - Skills and Knowledge Acquisition

The interviewees' responses shared that acquiring professional skills and knowledge was essential in helping them function efficiently in their roles. Factors such as tools to attain skills and knowledge, learning exposure and learning initiative were crucial in aiding OR NJNs in Singapore to acquire the necessary professional skills and knowledge for functioning efficiently as OR nurses upon completing their IP.

Participants described the tools to attain OR nursing knowledge and skills to separate what was taught during general nursing orientation and OR nursing induction, and orientation programmes were critical. The tools they acquired during their OR nursing IPs were indispensable for them to function in their roles, facilitate collaboration and communication, and support their skill development in the OR unit. On the other hand, learning exposure helped prepare OR NJNs in the study for their job roles within the clinical environment. However, as informed by the participants in the study, learning exposures differed between an NGN entering the profession and nurses with past experiences in other areas of the nursing discipline or OR nursing itself. This was because experienced nurses could rely on their expertise when exposed to familiar clinical situations. Also, even when learning was exposed to OR NJNs, it was overly done; thus, learning retention was low as the attention span was short during lectures that lasted for a prolonged period during IPs. The participants highlighted that overloading information did not help them retain lessons learnt during IP lectures. However, when learning exposure lacked the information necessary to prepare OR NJNs for their job role, so did their retention of learning of the lesson. Thus, they took the initiative to seek that information after IPs when exposed to the clinical area or did self-reading to understand vague concepts as they understood that the learning process did not stop once their IP concluded. In addition, clinical work rotation within the OR, buddying with

senior nursing colleagues, and teach-back sessions with other colleagues helped OR NJNs improve their skills and knowledge acquisition capabilities.

RQ2 Theme 1 - Adapting to a New Clinical Environment

Various factors contributed to the ability to adapt to a new clinical environment. These included immersing in a new work environment, tools to help function in a new clinical environment and resilience. Some of the OR NJNs in the study shared that one main factor contributing to their ability to adapt quickly to a new clinical environment was their previous exposure to the OR unit. The experience was vital to their adaptation because colleagues had higher expectations of them championing their job role due to the known notion of their work experiences.

Championing job roles for new graduates NJNs differed. New graduates OR NJNs reflected that their journey towards adapting to a new clinical environment was challenging because they were unsure of the speciality they would be allocated. Thus, it took them more time to get used to workflows at work because they were given a general concept of the different job roles in different OR unit areas. On the other hand, OR nurses with past experiences shared that their challenges were more towards familiarising themselves with the system in their new work environment, for example, robotic surgery devices. For the internationally trained nurse, the challenges they faced during their IPs were getting accustomed to the Singapore work culture.

Nonetheless, the different groups of nurses in the study highlighted that they understood that adapting to a new clinical environment would take time. Some nurses in the study mentioned they must learn to adapt to situations by learning on the job, even though they might not have been exposed to it during their IP. Thus, this built resilience in them. Although it might require nurses to overcome many obstacles, it was an essential skill that served them well when facing those challenges at work.

RQ2 Theme 2 - Quality of IP

Similar to how the quality of IP helped enhance skills and knowledge acquisition in RQ1 Theme 1, the quality of IP that invoked challenges in OR NJNs' ability to function in their job roles was contributed by three main themes, namely, satisfaction of IP delivery, outcome of IP in work preparedness, and ability to grasp learning. These factors led to a decrease in the retention of learning. The interviewees' responses showed that prolonged or short theory sessions with excessive content contributed to information overloading during their IPs. It led them to a decreased level of learning retention. As a result, it affected their satisfaction with the programme's quality, thus influencing their challenges with their ability to perform their roles.

Moreover, it led to gaps in hands-on sessions for them to practice essential basic skills required for their job roles, as the outcome of the IPs provided did not fully help prepare them for their roles. However, OR NJNs in the study shared that these provided opportunities for their department to improve on future OR IPs. These included being systematic in the IP approach and providing more interactive sessions.

Additionally, although their ability to grasp learning was hindered because they were overloaded by contents that led to the low outcome of the IPs provided, nurses in the study shared that they adopted their self-initiative to gather as much helpful information as they could during their IP that was helpful for their roles, as pointed out by their facilitators. As a result, it helped them visualise the concept of what was thought. Participants, however, pointed out that these issues could have been minimised had their IPs spent more time providing them with valuable information that would prepare them for the more advanced OR practice.

RQ 2 Theme 3 - Resource Person during IP

Nurses in the study shared two important areas concerning resource persons during their IPs. These included the quality and availability of the resource person. The availability of resource persons in their clinical area allowed them to clear doubts about the content delivered in their IP and access to staff they could approach to clarify job role ambiguity.

Resource persons during IP, such as the facilitators, were noted to be knowledgeable, empathetic and nurturing. However, some nurses in the study shared that their facilitators could have considered their opinions during their IP and for their OR unit to have been more systematic in their IP delivery. Additionally, when tagged with a resource person in their learning rotation during IP, nurses in the study would have preferred the resource person to have clarified the contents that should be delivered during the rotation as they felt that the resource persons during their IP clinical rotation were hesitant in teaching them because of their role ambiguity. Thus, nurses felt that the resource persons in the clinical area should have been informed of the topics to be taught. Nonetheless, the nurses in the study praised the resource persons in their unit during their IPs for the effort to help ease some challenges they might face.

Nurses in the study also shared that the availability of resource persons was vital in ensuring that their learning was accommodated. However, they mentioned that it was not always the case due to human resources. Experienced nurses shared that having a resource person such as a mentor or preceptor would have helped guide and encourage them and improve their skills. Nonetheless, some participants highlighted that despite the strain in the availability of resource persons, it could be overcome by communicating and building relationships with team members to engage in their learning.

RQ 2 Theme 4 – Challenges with Skills and Knowledge Acquisition

Nurses in the study discussed three aspects that contributed to the challenges with skills and knowledge during their nursing IPs. These factors included information overloading, classroom versus reality, and accessibility to OR nursing skills and knowledge.

Some participants highlighted that the contents provided during their IP were excessive to the extent that learning could not be retained. Thus, described it was as counterproductive by the nurses. Some nurses also shared that it would have helped reduce their mental fatigue if overloaded content had been evenly spread. However, experienced nurses described that the overloading of contents had more to do with irrelevant OR nursing topics. In terms of OR nursing topics, they felt they were sufficient for OR nurses with experience but could be lacking for novice OR nurses. Thus, time spent on non-OR nursing content could have been better used to focus on the OR nurses' required knowledge and skills.

Nurses later highlighted that the over-coverage and under-coverage of OR nursing content led to challenges transitioning from the classroom to the clinical environment. Nurses in the study explained that it was related to the inability to translate theory into practice, as what was visualised in the theory sessions differed when rotated into the clinical areas. Therefore, nurses in the study indicated that more hands-on sessions would have benefited them and eased the challenges of transition from the classroom to the clinical areas.

Lastly, the participants shared a kaleidoscope of methods that would have benefited them in accessing the knowledge and skills they needed to function in their job roles despite the overloading of information and reality shock they experienced during their IPs. These included sharing sessions and more time spent on clinical rotation instead of classroom theory sessions. A handful of participants shared that the sharing sessions lacked during their IPs, and the facilitator mainly dominated interactions. One participant also highlighted that it

benefited nurses if they knew their job roles sooner so that they could have picked up on the necessary knowledge and skills when in the classroom and during their clinical rotations to nurture them in the roles and responsibilities.

Discussion of Results in Light of Theory and Conceptual Framework

The study was built upon the theoretical foundation of Benner's *From Novice to Expert* theory and Warren and Mills's *Conceptual Model of Nursing Motivation*. The foundations of the theory and conceptual model allowed the researcher to accomplish the study's original research purpose: to explore the impacts current OR nursing IPs in Singapore had on its NJNs as a result of the challenges they faced during the IP period to better prepare nurses in providing competent OR nursing care. Nursing researchers shared in the literature that transitions to practice were commonplace NGNs encounter in their transitional challenges from student to professional practice (Gregg, 2020; Rabie et al., 2020; Teoh et al., 2013).

Benner's Novice to Expert Theory

According to Benner (1984), individuals would undergo five skills and knowledge acquisition stages. These included novice, advanced beginner, competent, proficient, and expert. Additionally, these stages change in three elements: dependent to independent skill acquisition, from a small world view to a holistic view of a clinical situation after new knowledge and skills acquisition, and from observer to active participant (Benner, 1982). The findings in this study support Benner's notion. For example, in the quantitative survey, more respondents agreed to statements relating to knowledge and skills acquisition challenges that later impacted their job roles due to a deficiency of such information during their IPs. The demographic results reflected these issues, as more than 70% of respondents either recently graduated from nursing school or joined their OR unit in less than two years. The qualitative

findings supported the quantitative results. For example, nurses with experience highlighted that they had fewer issues adapting to a new OR unit than fresh OR nurses and NGNs.

Furthermore, OR nurses with more years of working experience were more resilient towards independently nurturing their skills. They also shared that a systemic approach to the delivery of IPs would have been beneficial. These findings were supported by existing literature stating that nursing TSPs lacked organisation (Brown & Sorrell, 2017; Horwarth, 2010; Whelan et al., 2016). Thus, it led to formal preparation for their roles.

Warren and Mills's Conceptual Model of Nursing Motivation

According to Warren and Mills (2009), certain perceived efforts must be a product for nurses to react to their behavioural actions. These included organisational rewards and incentives. Three function items were related to these: values, identity and utility (Warren & Mills, 2009). The model mainly focused on organisations identifying how to support their nurses to pursue higher education through organisational influences (Cathro, 2011; Kovner et al., 2012; Schwarz & Leibold, 2014). In this study, the results reflected three relationships to the model. Firstly, in the quantitative survey, 89% of respondents would recommend their IPs to further employees. Although higher percentages of agreement towards challenges faced in job roles after and during their IP, the overall outcome was positive. Ultimately, there were higher ratings towards having been identified as a team member in their OR, having received an IP and the overall satisfaction of the TSPs that motivated nurses in their skills and knowledge acquisition. It was supported by the qualitative study, where participants shared that championing in the job roles was inspired by their ability to adapt to the quality of IP, availability of resource persons and knowledge and skills acquisition. As stated in Warren and Mills's framework, the lower the satisfaction with their current employment, the higher their motivation to pursue higher education (2009). The authors also shared that rewards were insufficient to motivate future educational pursuits. Similarly, as found in this study, the more

the challenges that impacted OR nurses in their job role during and after IP, the higher their motivation to self-motivate and acquire knowledge and skills related to their job roles.

Discussion of Results in Relation to the Literature

The impacts of OR unit IPs on OR NJNs have been studied internationally. The extant literature shared similar findings to this study. For example, challenges faced by OR nurses due to the lack of education during their IPs led them to resign from their roles due to clinical errors leading to a sense of guilt (Spruce, 2019) as a result of their lack of clinical decision-making skills of different clinical scenarios that expert OR nurses possess (Arzani et al., 2016). Additionally, nurses felt a vast disconnect between school and professional practice regarding knowledge and skills assessments (Al Awaisi et al., 2015; Lewis-Pierre, 2013; Ortiz, 2016). Also, nurses who were overseas qualified or moved to a new employer with a background in OR nursing found that the main challenge faced was adapting to their new organisational culture and workflow (Ohr et al., 2016; Zanjani et al., 2018).

Findings in this mixed-methods study found that NJNs identified issues that impacted their role after receiving IPs were consistent with the extant literature. In addition, the study's predictor variables were interrelated in presenting these impacts. Ultimately, as nurses in the study's qualitative interviews shared, developing resilience in their professional roles helped them acquire the knowledge and skills required and overcome the challenges faced due to the impacts of their IPs. These findings were consistent with the literature within OR nursing suggesting that enhancing resilience could reduce transition shock and stress among NGNs in the OR unit (Stephens et al., 2017), and individuals need to learn to develop resilience in difficult situations and environments (Duncan, 2020; Veerapen & McKeown, 2021).

Summary

The findings of the explanatory sequential mixed-methods design study provided insights into perioperative nursing IPs' impacts on OR unit nurses in Singapore with their

transition to practice and the ability to perform job roles and function in a new clinical environment. Firstly, in the quantitative study, the nurses determined the challenges they faced with their IPs and the satisfaction level of their TSPs based on the self-developed *IORNTSP survey*. Eight of the participants from the quantitative study were later invited to participate in a face-to-face interview via Zoom. The qualitative interview was guided by a self-developed questionnaire designed by the researcher.

The author began the chapter by addressing the trustworthiness of the study. It ensured credibility, transferability, dependability and conformability throughout the study to ensure data collection, interpretation and accurate reporting were maintained. Additionally, an internal consistency reliability test using Cronbach's alpha test was used to assess the reliability of the questionnaire. A validity test using an expert review with the aid of experts in clinical nursing and academia was employed to establish the content validity of the instrument tool.

Next, the quantitative survey results were discussed. Of the 96 that completed the online survey, 91 surveys were deemed eligible as they met the inclusion criteria and were analysed using IBM SPSS Version 28.0.1.1. The demographics of the respondents included 35.2% ($n = 32$) males and 64.8% ($n = 59$) females, with the largest group of respondents aged between 20 and 23 years old ($n = 52$). Most respondents had attained a diploma in nursing (56%), and the typical years worked in the current OR unit by most respondents was one year (18.7%). 93.4% ($n = 85$) of respondents received an OR specialised IP. Statistical analysis tests were run to address RQ1 and RQ2. The results of the statistical analyses for RQ1 showed that most NJNs agreed that the content covered for their OP was satisfactory. Next, most participants responded that the lack of technical skills exposure during IPs presented challenges after their IPs. Similarly, challenges putting theory and skills together and reaching a competence level based on their nursing level due to the lack of resources

provided during their IPs, helping understand and seeking clarification on topics covered during and after their IPs and challenges with their confidence due to the lack of skills and knowledge received in their IPs were most commonly observed. Lastly, most participants agreed that insufficient content coverage during IPs later impacted their job function.

Following that, the Independent T-test was performed to compare the effect of specialised OR IPs on two different groups of NJNs. It showed no significant difference in the impact of specialised OR IPs on the two groups of NJNs in terms of putting knowledge into practice after undergoing a specialised IP. Similarly, the test results showed no significant difference in their ability to put theory into practice based on their level of OR nursing. Lastly, to help answer RQ1 further, Spearman's rank-order correlation coefficient was performed on two variables. It showed a very weak positive correlation and no statistical significance between OR NJNs' perceived knowledge and skills received in performing job roles and putting theory into practice after undergoing their specialised IP.

Later, simple and multiple regression was executed to determine the relationships between the predictor variables, Q26 to Q37, with Q38 to help answer RQ2. The results highlighted a significant and strong positive correlation between how well OR NJN facilitators guided them during their IPs and the overall helpfulness of IP in preparing for job competence. The results also showed a significant but moderate negative correlation among variables Q30, Q32 and Q36 with Q38. However, Q28 and Q29 presented no relationships with Q38. It was also noted that the regression results of 10 predictors only showed that Q38 significantly predicts only Q31, Q32, Q35 and Q37.

Furthermore, the Mann-Whitney *U* Test showed challenges impacting Singapore OR NJNs' ability to perform their job roles were not influenced by whether they received a specialised OR IP or did not, as both groups equally faced challenges. Lastly, Spearman's rank-order correlation to examine the relationship between Q33 and Q34 revealed a weak

positive correlation and statistical significance, suggesting that although both variables tend to go up in response to one another, the relationship was not very strong.

Next, Spearman's rank-order correlation was run for the study's hypotheses testing to examine the relationship between Q26 and Q39. The results suggested that as lack of adaptation time increased, so did insufficient topic coverage during IP and challenges in reaching competence level due to lack of time given during probation. It was similarly observed that as facilitator guidance went up, so did the overall helpfulness of IP in job role preparation. Lastly, the results also noted that as insufficient topic coverage during IP increased, so did challenges in reaching competence level due to lack of time given during probation. On the other hand, the results also indicated a strong negative correlation and statistical significance between Q27 and Q38. It suggested that when the lack of receiving the necessary and sufficient technical skills for the respondent's role at their level increased, the overall helpfulness in job role preparation after IP decreased and vice-versa. The results also showed moderate negative correlation and statistical significance among some variables, suggesting that as one variable increased, the other decreased. However, it did not suggest a cause-and-effect relationship between these variables but, indeed, a noticeable relationship.

Subsequently, the chapter presented the results of the qualitative study. The qualitative study aimed to explore the impacts of OR nursing IPs on NJNs in Singapore OR units to prepare better nurses to provide competent OR nursing care based on the lived experiences of the participants interviewed. The following research questions were used to guide the qualitative study:

RQ1. To what extent did having an OR unit-specific specialised nursing IP enhanced OR unit nurses' knowledge and skills in performing new job roles?

RQ2. To what extent did the challenges NJNs in Singapore OR face with the OR unit-specific specialised nursing IP affected their ability to perform their roles?

A total of 8 nurses from the quantitative study participated in the qualitative research from the 13 recruitment emails sent. All participants were interviewed via Zoom. In addition, the researcher kept a research diary to record any observations that might be useful to the data collected, such as the researcher's thoughts and participants' upper body language and tone of voice during the interview. The audio recording of the interviews was listened to several times and then transcribed verbatim by hand into an MS Word document for each participant based on the interview guide questions designed by the researcher. The primary findings revealed six themes contributing to the challenges faced by Singapore OR NJNs after undergoing the IPs that impacted them in their professional practice. These themes were:

- RQ1 Theme 1. Quality of IP.
- RQ1 Theme 2. Skills and knowledge acquisition.
- RQ2 Theme 1. Adapting to a new clinical environment.
- RQ2 Theme 2. Quality of IP.
- RQ 2 Theme 3. Resource person during IP.
- RQ2 Theme 4. Challenges with skills and knowledge acquisition.

RQ1 Theme 1. Quality of IP. The responses from the interviewees relating to RQ Theme 1 reflected the pivotal role the IP quality had in enhancing Singapore OR unit nurses' knowledge and skills in performing new job roles. Participants highlighted that issues associated with and contributed to the quality of their IPs were:

- Availability of IP.
- Delivery of IP.
- Length of IP.
- Topics coverage.
- How satisfied they were with their IPs.

- Comparing past OR IPs received.

The nurses also explained how comparing past OR IPs and IPs they recently received helped them reflect on what could have been done better and how their IPs have affected their current professional status.

RQ1 Theme 2. Skills and knowledge acquisition. The responses from the interviewees concerning *RQ1 Theme 2* reflected the necessity of acquiring professional skills and knowledge for the efficiency of their job roles. Nurses in the qualitative study shared that factors such as learning exposure, retention, and reflection were crucial in aiding them in attaining the necessary professional skills and knowledge to function efficiently as OR nurses upon completing their IPs. However, the study revealed that learning exposures differ between NGNs entering the profession and nurses with past experiences in other areas of the nursing discipline or OR nursing itself. Furthermore, nurses added that clinical work rotation within the OR unit, being buddied with senior nursing colleagues, and teach-back sessions with other colleagues helped them improve their skills and knowledge acquisition capabilities. Lastly, the nurses added that when available, providing feedback and having open discussions after lectures helped reduce challenges in their ability to perform their job roles that may arise after their IPs.

RQ2 Theme 1. Adapting to a new clinical environment. Participants shared various factors contributing to their ability to adapt to a new clinical setting. Some respondents shared that one main factor contributing to their ability to adapt quickly to a new clinical environment was their previous exposure to the OR unit. These experiences were vital to their adaptation because there were higher expectations for them in championing their job role by colleagues due to the known notion of their past working experiences. Championing job roles for new graduates NJNs, however, differed. These nurses reflected that their journey towards adapting to a new clinical environment was challenged by the uncertainty of the

speciality they would be allocated. Thus, it took them more time to adjust to workflows as they were given a general concept of the different job roles in other OR unit areas during their clinical rotations.

RQ2 Theme 2. Quality of IP. The researcher observed from the findings that RQ2 Theme 2 shared similar traits to how IP quality helped enhance skills and knowledge acquisition in RQ1 Theme 1. However, the quality of IP for RQ2 Theme invoked challenges in OR NJNs' that were more related to their ability to function in their job roles. The overloading of information contributed to the main issues during their IPs. Therefore, participants shared that this led to a decrease in their learning retention. The responses shared highlighted that the overloading of information during IPs did not help them retain learning after the sessions. As a result, it affected the quality of their IPs. It also led to a deficiency in opportunities for hands-on sessions as the programmes they underwent focused more on the theoretical aspects of their job roles. Despite these issues, the nurses shared their self-initiatives to learn and helped them overcome challenges.

RQ 2 Theme 3. Resource person during IP. The interviewees' responses recounted that it was essential that resource persons were available during their IPs. It allowed them to clear doubts about the content delivered in their IPs and access to staff they could approach to clarify job role ambiguity in the clinical areas. However, some nurses shared that they would have liked their opinions to be considered by their facilitators during their IPs and their IP delivery to have been more systematic. Additionally, nurses recounted that when tagged with a resource person in their learning rotation during IPs, the buddied nurses were unsure of what information to share as both parties were uncertain about the interviewees' assigned job role. Thus, clarifying the job role before starting clinical rotation could have benefited those sessions.

RQ2 Theme 4. Challenges with skills and knowledge acquisition. The interviewees' responses concerning the difficulties with skills and knowledge during their nursing IPs featured three factors. These included information overloading, classroom versus reality, and accessibility to OR nursing skills and knowledge. Participants highlighted that the excessive non-OR-related content reduced opportunities to gain purposeful knowledge and skills in their job functions. As a result, learning could not be retained as it was counterproductive and created mental fatigue. Nurses also pointed out that the over-coverage and under-coverage of OR nursing content led to challenges transitioning from the classroom to the clinical environment. They elucidated that it was related to the inability to translate theory into practice, as what was visualised in the theory sessions differed when rotated into the clinical areas.

Lastly, the participants shared various methods that would have benefited them in accessing the knowledge and skills required to function in their job roles despite the overloading of information and reality shock they experienced during their IPs. These included sharing sessions and more time spent on clinical rotation instead of classroom theory sessions. Participants shared that the sharing sessions lacked during their IPs could have been improved, and the facilitator dominance in classroom interactions could have been moderated. One participant also highlighted that knowing their job roles sooner would have enhanced their ability to access the necessary knowledge and skills during their IPs.

Next, the theoretical foundation of Benner's *From Novice to Expert* theory and Warren and Mills's *Conceptual Model of Nursing Motivation* built upon the study showed that the challenges faced by Singapore NJNs OR with the IPs they underwent were similar to what these theoretical foundations shared. Firstly, when comparing the results to Benner's *From Novice to Expert* theory, the researcher observed that the years of experience in OR nursing reflected on OR nurses' ability to function in their job roles and

acquire knowledge and skills. When comparing the findings to Warren and Mills's *Conceptual Model of Nursing Motivation*, the researcher observed that certain perceived efforts must be a product for nurses to react to their behavioural actions. Ultimately, the nurses in the qualitative study shared that the more the challenges that impacted them in their job roles during and after IPs, the higher their motivation to self-motivate and acquire knowledge and skills related to their job roles.

Lastly, the chapter discussed the study's findings concerning the literature. From the results, the researcher found that developing resilience and having self-initiative in their professional roles ultimately helped OR NJNs acquire the knowledge and skills required and overcome the challenges faced due to the impacts of their IPs. The study's findings, consistent with the extant literature, suggested that enhancing resilience and having self-initiative could reduce transition shock and stress among NGNs in the OR unit, and the need to learn to develop resilience in difficult situations and environments was essential for nurses in their professional journey.

In summary, chapter 4 of the study presented the trustworthiness, reliability, and validity of data for the study, data collection results and responses, and the evaluation of the findings. The final chapter of the study will focus on presenting the implications and recommendations and the study's conclusion.

CHAPTER 5: IMPLICATIONS, RECOMMENDATIONS, AND CONCLUSIONS

The study was established to address a gap in nursing research associated with the impacts of IPs on OR nurses in Singapore. The study's findings were relevant because they addressed these gaps discussed in Chapter 2. In addition, the extant literature demonstrated the need to address the impacts identified in the study because it was crucial to the retention of nurses in Singapore who were already affected by various economic, professional and social issues (Chua, 2020; Leong & Crossman, 2015; Tiew et al., 2017; Woo & Newman, 2020).

The problem arose because OR units were trying to compress the knowledge and skills of OR nursing into OR IPs within a few weeks. However, it was not feasible as such knowledge and skills required months and years of training to be attained and proficient (Ball et al., 2015; Martin, 2011; Sherman, 2015). The literature also highlighted that theoretical nursing alone could not help nurses resolve complicated clinical issues when they arose, as each situation presented unique challenges. Thus, nurses reacted to what was best known or from previous experiences in similar situations. In turn, it resulted in nurses feeling stressed, especially when assisting in major surgeries (Smith et al., 2015a). Moreover, amid health crises like the recent SARS-CoV-2 pandemic, the absence of perioperative nursing exposure has been reduced for student nurses as elective surgery services were reduced or blocked momentarily. Thus, it created more issues for the OR profession in the coming years.

The explanatory sequential mixed-methods research design study aimed to explore the impacts that Singapore NJNs OR face with their current IPs to better prepare nurses in providing competent OR nursing care. To address the problem and purpose statements, the researcher established the research questions and hypotheses to guide the study.

The explanatory sequential mixed-methods research design allowed the researcher to collect and analyse quantitative data, followed by collecting qualitative data to explain the quantitative data (Almedia, 2018; Creswell, 2014; Schoonenboom & Burje Johnson, 2017; Shorten & Smith, 2017). Ultimately, adopting the researcher design was to provide a triangulation of results and address the flaws of quantitative and qualitative research designs. The cohort study design was also adopted to guide the mixed-methods study because of its unique observational study characteristics to explore two or more groups over a particular time (Sedgwick, 2014; Wang & Kattan, 2020). Three sampling methods were used to recruit participants: convenience, purposive, and snowball. First, an online survey was done for the quantitative study via Google Forms. Then, participants were drawn using convenience and snowball samplings through Gatekeepers who work in a Singapore OR health group. A phenomenology study was adopted for the qualitative research, where face-to-face interviews via Zoom were performed with participants to express their interest in participating in the follow-up study. These participants were invited via email, and informed consent was signed before the commencement of the interviews. Data collected were analysed accordingly. Quantitative data collected were analysed using SPSS, while qualitative data was analysed using Braun and Clarke's (2014) six-step thematic analysis approach.

Several limitations existed in the study that should be considered when interpreting the results. Firstly, the vulnerability of bias in the study included sampling bias and researcher bias. The researcher acknowledged that the sampling methods chosen lack external validity, generalisability, and representativeness of the targeted population (Parker et al., 2019). Ideally, simple random sampling should be adopted to allow any subjects within the inclusion criteria to have an equal chance to participate in the study to reduce sampling errors and bias by selecting the studied population using randomisation (Rahi 2017; Willson & Stonecypher, 2015; Hill & Dever, 2013). However, the timing was another limitation of

the sampling choice in the study. Due to the period that the study was done, the hospitals that were reached out to were not keen on the research topic as the organisations focused on the battle of the SARS-CoV-2 pandemic crisis. Thus, the areas of focus of the research were more focused on such issues. Despite these limitations, the researcher ensured that sampling bias was reduced by making an extraneous effort to approach parties that met the inclusion criteria based on gatekeepers and OR nurses' referrals. In addition, to reduce the researcher's bias, bracketing was used when interviewing and analysing data to maintain and minimise bias (Smith et al., 2015b; Woo & Newman, 2020). These included keeping a research diary to separate one's assumptions, thoroughly planning before data collection, using interview guides to conduct face-to-face interviews, and involving participants unknown to the researcher.

Another limitation of the study was the number of participants. Although the researcher sought to recruit 114 participants, only 96 respondents responded to the invitation through gatekeepers. Of the 96, only 91 respondents met the inclusion criteria. Therefore, the researcher exhaustively accepted the study participation invitation by approaching as many gatekeepers as possible and repeating assistance to reach the research population. However, due to the timing of the research, a limited number of NGNs or NJNs were being posted to the OR units. Thus, the number of participants was rich during the time of research. It was further strengthened by the high number of completed surveys and interest in participating in the qualitative study.

Next, ethical dimensions were meticulously undertaken in the study:

1. Before proceeding with data collection, the researcher underwent a thorough process of gaining ethical approval from the Unicaf University UREC. It included discussing confidentiality and anonymity for participants for the study and familiarising oneself with the Unicaf University research policy.

2. All gatekeepers were given a gatekeeper's letter to inform them about the purpose of the research and their involvement. Participants were given a participant information sheet, separated from the questionnaire survey, to inform them about the totality of the research and provided an option for them to leave the study at any time without discrimination.
3. Participants for both studies were deidentified to maintain anonymity, and encrypted passwords for data files were only kept and known by the researcher.
4. The author allowed authentic responses from interviewees by using an open-ended questionnaire guide and avoided any interpretations.
5. The researcher also remained versatile when asking questions, and member checking was done after transcribed verbatims to ensure correct data were obtained and allowed addition and clarification of responses.

This chapter will present a comprehensive summary of the study. It would include the study's implications that would discuss how potential limitations might have affected the interpretation of the results. It would also include the importance of practice for OR nursing in the context of the literature review and how the study built to the existing body of research on the research topic for the doctoral degree. Next, the recommendations for applications and future research will be discussed. Lastly, the study's conclusion would be to discuss its take-home message.

Implications

Investigating the challenges OR NJNs in Singapore faced with their IP that impacted their ability to function in their job roles and the ability for knowledge and skills acquisition was critical considering the growing global nursing shortfall. In the context of Singapore nursing, the ever-increasing human resources issue became concerning when rapid growth in the ageing population and the increasing prevalence of complex long-term diseases mandated

the expansion of the Singapore healthcare sector (Ow Yong & Cameron, 2019; Tan & Lee, 2019). It included expanding and constructing new healthcare facilities to facilitate care according to district and patient health needs (Ow Yong & Cameron, 2019; Tan & Lee, 2019). These issues grew concern for OR units in Singapore because of the reduced diversion of nurses deployed to the OR unit due to reduced elective surgeries during the SARS-CoV-2 pandemic. Thus, the focus for NJNs was focused on managing nursing care for such patients.

Prior to the study, no literature explored the challenges OR NJNs in Singapore faced with their IPs that impacted their ability to function in their job roles and their ability for knowledge and skills acquisition. Nonetheless, prior studies that existed internationally provided some insights. However, it did not address the nursing culture in Singapore, which posed different challenges. Therefore, in this section, the researcher will provide the implication of findings based on the literature and the theoretical and conceptual framework adopted.

RQ1 - To what extent did having an OR unit-specific specialised nursing IP enhanced OR unit nurses' knowledge and skills in performing new job roles?

The literature suggested that IPs were necessary for nurses regardless of professional experience as the new environment would equate to their experience, similar to a novice nurse (Benner, 1984). Additionally, the literature shared that IPs were arguably the cornerstone for nurses' professional development because the professional practice had limited nurses' ability to hone themselves further academically due to commitments to build their professional confidence (Pertiwi & Hariyati, 2019). Ankers et al. (2018) also shared that nurses were more confident at the end of their 12-month transitional programme. Therefore, it implied the importance of having IPs for NJNs. Although some researchers argued that IPs showed no significance between baseline confidence at the end of nurses' transitional programmes (Hussien et al., 2017), the study demonstrated that OR NJNs in Singapore

expressed the importance of having a structured IP to guide their initial months to professional practice and environment.

Additionally, in the quantitative study, most nurses reflected that their OPs were satisfactory. However, it was later highlighted by the nurses in the qualitative research that the OPs they underwent only provided them with an overview of the organisational structure and the company's history. Regardless, nurses in the study found it helpful in transitioning to the new job role and environment and that the learning journey continued past the IPs provided. The findings of the study were concurrent with the literature, which indicated that induction and orientation programmes were especially crucial in speciality care areas as they helped build a firm foundation of nursing practices that were not previously exposed in student nursing (Green, 2016; Wolff et al., 2010; Monforto et al., 2020). Hence, healthcare facilities should not disregard any transitional programmes.

RQ2 - To what extent did the challenges NJNs in Singapore OR face with the OR unit-specific specialised nursing IP affected their ability to perform their roles?

The mixed-methods research also highlighted the challenges that influenced NJNs in Singapore OR with their ability to perform their roles. In the quantitative results, it included the following:

1. Challenges faced after IP due to lack of technical skills exposure.
2. Challenges putting theory and skills together after IP based on level of nursing.
3. Challenges after IP as content was not sufficient to function in the role.
4. Challenges understanding concepts and seeking clarification during and after IP.
5. Challenges faced reaching competence level during probation due to lack of resources.
6. Challenges with confidence due to lack of skills and knowledge received in IP.

The study's quantitative survey also found no significant relationships between nurses who identified as having received a specialised OR IP and those who did not. The findings reflected that having an IP and those with none did not determine nurses' knowledge and ability to put theory into practice based on their level of OR nursing. The findings were later expanded in the qualitative phase, demonstrating the reason for the weak and non-significant relationship. It included nurses' initiative to seek that information after IPs when exposed to the clinical areas or performing self-reading to understand vague concepts. In addition, the nurses in the study shared that during clinical work rotations within the OR, they took the opportunity to improve their skills and knowledge acquisition capabilities by having teach-back sessions with other colleagues, asking questions with expert OR nurses and building relationships with other professionals in the OR unit. Ultimately, despite the positive feedback on the overall helpfulness and satisfaction of IPs, the self-resilience and initiative helped these nurses overcome their challenges. The study's findings added to gaps from past studies which shared the significance of OR IPs (Stephens et al., 2017; Wakefield, 2018).

Next, the literature stressed that competence in OR nursing would be achieved after at least two to three years of practice (Ball et al., 2015). However, the ability to perform such competence had been challenged as nursing educational institutes had reduced or removed OR nursing rotation from their curricula to focus on other nursing areas (Beitz, 2019; Gregory et al., 2014; Sherman et al., 2014). Therefore, the OR nursing profession became unknown to novice OR nurses (Wilson, 2012). In addition, it had significantly increased during the recent pandemic as elective surgeries were halted to make beds available for SARS-CoV-2 patients. Besides, the literature described various elements when addressing OR nurses' ability to function in their job roles. It included technical and non-technical skills (Ball et al., 2015; Cavdar et al., 2019; Ingvarsdottir & Halldorsdottir, 2017; Saletnik, 2018; Smith & Palsey, 2018; von Vogelsang et al., 2019).

In the quantitative study, the researcher also observed four significant elements that addressed the relationships between the helpfulness of OR specialised IP and reaching OR nursing competence for the ability to perform their roles. Firstly, the study's results reflected that despite the challenges faced by NJNs with IPs that impacted their ability to perform their job roles, they agreed that the programme was helpful overall as they found the facilitators that guided them well during their IPs. It was later explained by nurses in the qualitative study who were interviewed that facilitators and resource persons were helpful during the period of IP because it gave them an avenue to clear doubts about the content delivered and clarify job role ambiguity in the clinical areas. Additionally, one nurse shared that the compliments or scolding they received for their work performance did not matter. Ultimately, it was their toughness to survive in their roles that mattered regardless of how the impacts of their IPs posed challenges to them. The concept was similar to the extant literature. The extant literature highlighted that despite the powerlessness nurses felt when being at the bottom of the chain of hierarchy, their self-resilience was their survival tool (Leong & Crossman, 2015; Hung et al., 2018; Wong et al., 2018; Yang & Zhou, 2020).

Secondly, although most nurses in the quantitative study agreed that challenges faced after IPs were present as contents were not sufficiently covered to help in their role, they still felt that their IPs were overall helpful. It was explained by nurses interviewed in the qualitative study that the work hacks, emphasis on specific topics during IPs and the ability to provide feedback when available provided them with the survival tools after their IPs. Therefore, despite the lack of guidance and poor learning exposure and retention, the survival tools they were equipped with helped ease the burden when role ambiguity was present. The concept's findings added to the literature gap regarding the relationship between role ambiguity, specialist qualification and nursing competence, where it previously only focused

on the nurse-patient relationship phenomenon (Blomberg et al., 2019; Gillespie et al., 2018; Smith & Palesy, 2018).

Thirdly, the findings in the quantitative study suggested that sufficient time to reach OR nursing competency before confirmation of role was a challenge. The literature stated that it was because the progression in OR practices should only occur once a competent level was achieved (Pupkiewicz et al., 2015). Thus, progressing an individual to the next level before the competence level was achieved would result in an overload of learning abilities, thus causing a loss of confidence and increasing learners' anxiety. The literature suggested an ideal time frame of six months to a one-year minimum for nurses to reach basic competence (Baldwin et al., 2016; Kowalski & Cross, 2010; Chappy et al., 2016; Maxwell, 2011; Rush et al., 2013; Vortman & McPherson, 2021). In the qualitative study, it was noted that such a time frame became redundant as, during their clinical rotation, nurses' permanent job roles were still ambiguous. Even when job roles were identified early, the delivered content lacked relevance to OR job settings. The findings echoed the extant literature that pointed out that topic redundancies should be eliminated during IPs to improve the efficiency of programme delivery (Monforto et al., 2020).

Lastly, the timeframe given to nurses new to a clinical area for knowledge and skill acquisition should not be undermined. The literature stated that the length of the IPs was essential for new nurses to transition successfully after their probation period and could be met with repartition (Woo & Newman, 2020). Furthermore, the timeframe allowed new nurses to socialise in their new practice settings (Nour & Willams, 2019).

In the survey study, despite the majority of OR nurses agreeing that their specialised IPs helped prepare them for their job competence, they faced challenges with confidence due to a lack of skills and knowledge acquisition in their IPs. Nurses in the phenomenology study explained that it was the case because of the expectations already set upon them because of

their known experience as OR nurses. For nurses who were new to OR nursing, the problem arose because the IPs were not systematic. Therefore, it led to insufficient professional performance readiness. In summary, the findings of the mixed-methods study suggested that at different levels of effect, challenges OR unit nurses face in their new job role mediated the relationship between the impact of OR unit-specific specialised nursing IPs and the knowledge and skills in performing their new job role. Furthermore, the findings demonstrated that the challenges that OR NJNs faced due to the impacts of the IPs they underwent differed based on the level of education and experience working as an OR nurse. Hence, the alternative hypotheses were accepted as observed in the findings that having an OR unit-specific specialised nursing IPs would result in the enhancement of OR NJNs in Singapore knowledge and skills in performing their new job role and having an OR unit-specific specialised nursing IPs had effects on the challenges Singapore OR NJNs faced with their ability to perform their functions.

Theoretical Implication. The mixed-methods study was built upon two theoretical models: Benner's *From Novice to Expert* theory and Warren and Mills's *Conceptual Model of Nursing Motivation*. Using these two models as a foundation to interpret the study's findings, the author examined the impacts OR nursing IPs in Singapore OR units had in its OR NJNs. The findings demonstrated that impacts were the results of the challenges that Singapore OR NJNs faced due to the impact of the IPs they underwent that might differ based on the level of education and experience working as an OR nurse.

Firstly, the goal of using Benner's *From Novice to Expert* theory to guide the study was to explore and explain the impacts OR IPs in Singapore had on its nurses based on the OR NJNs' level of nursing and associated competence. The level of nursing was integral to the association of Benner's theory. According to Benner (1984), every nurse would undergo five skill and knowledge acquisition stages. Benner (1982) added that each transition

from these five stages involved three elements. The model demonstrated that the process of knowing (experience) was gained when exposed to a repeated situation. As nurses gained relevant skills from repeated situations, they became more intuitive in their clinical skills and decision-making. As a result, it built their confidence in their profession. These processes were supplemented by encouragement from mentor nurses from earlier stages (Benner, 1984). The model was applied to all nurses new to the profession, position and department (Whelan et al., 2016).

According to Whelan et al. (2016), when applying Benner's theory in their study, the stimulation training allowed both OR nurses and their trainers to identify their strengths and weaknesses with their OR nursing practices, thus allowing them professional growth and improvements. In addition, the study of Whelan et al. (2016) reflected that Benner's theory was beneficial in helping them understand the concept of systemic skills acquisition. Earlier studies concurred with Whelan and team, contributing to the literature stating that adapting Benner's theory was beneficial in conceptualising a new framework to re-evaluate the future of perioperative nursing education (Dumchin, 2010; Horwarth, 2010). Other studies have also shared that experienced nurses joining the OR as a new profession struggled to make clinical decisions when in their new role. The lack of exposure to their new clinical environment became an uncharted territory (Arzani et al., 2016).

Within this study, the statistical data demonstrated that challenges among nurses without any OR nursing experience were higher than among those new to the profession. Ultimately, most NJNs of all years of experience agreed that the IP they underwent helped prepare them for their job competence and found that their job role was assigned to them suitably. The descriptive data within the survey study explored this phenomenon. The finding suggested that challenges among all different levels of nurses in terms of years worked as a nurse and OR nursing experience were evident. The difference lay in their circumstances

when they underwent their IPs. In the phenomenology study, participants highlighted that these included the transition to a new hospital, NGNs, and experienced nurses new to OR nursing. Ultimately, nurses built their OR nursing competence based on their self-initiative to explore their job functions and build self-resilience. However, they did not discredit their IPs for being helpful, as the IPs helped them nurture the foundation of their self-built nursing competence. The mixed-methods study provided data that supported researchers in the extant literature that have shared that these issues could be rectified with structure TSPs (Byrd et al., 2015; Cotterill-Walker, 2012; Martin, 2011; Wilson et al., 2019), encouraging adequate knowledge sharing between learner and teacher (Boyer et al., 2018; Cook, 2016), and having a supportive clinical learning environment (Byrd et al., 2015; Cotterill-Walker, 2012; Martin, 2011; Teoh et al., 2013; Wilson et al., 2019; Wakefield, 2018).

Secondly, the mixed-methods study was guided by Warren and Mills's *Conceptual Model of Nursing Motivation* to identify the organisational influences and individual characteristics that motivated nurses to act on their behavioural intentions. Using the conceptual model as a guide allowed the researcher to explore and contrast the impacts OR nursing had on OR NJNs in Singapore, which affected their job roles. It entailed challenges in their roles and acquiring the necessary knowledge and skills to succeed. According to Warren and Mills (2009) revised motivational model that was the combination of 'Porter and Lawler's 1968 work motivational theory and Sussman and Vecchio's 1982 concepts of organisational influences and individual characteristics', nurses' decision to return to obtain higher nursing qualifications were influenced by multiple factors. Alamri and Sharts-Hopko (2015) contributed to the literature by expressing that it was essential to consider nurses' motivation to return to school to obtain higher nursing qualifications by developing policies and strategies to support the growing population and care needs.

Within the phenomenology study, nurses shared in the descriptive findings that despite the vast disconnect theory sessions during their IPs compared to their practical clinical rotation, self-initiation was their motivation to champion their roles. Additionally, they shared that despite being overloaded with theoretical content during their IPs, they gathered the necessary information that their facilitators pointed out, ultimately helping them visualise the concept of the lessons. The descriptive findings in the study supported the statistical results in the survey, which shared an antagonistic relationship: the overall satisfaction of IPs and the challenges nurses faced during and after IPs. The statistical findings showed that despite higher percentages of nurses expressing that they struggled with factors such as confidence and reaching competence level due to lack of OR nursing knowledge and skills exposure, they still found that their IPs helped prepare them for their job role and eventually found the roles were suitable. It suggested that nursing competence and confidence were only not reliant on the effectiveness of the structure of a nursing support programme but also on the motivation of individual nurses to champion their appointed roles. The mixed-methods study provided new insights into overcoming challenges that were impacts of nursing IPs not previously expressed in the extant literature. Hence, Singapore OR units could adopt such tools to mitigate better challenges that NGNs faced during their transitional period to reduce the impacts it created on their ability to function in their roles.

Practical Implications. Several practical implications surfaced from the mixed-methods study. If applied, it could help NJNs and nursing management and be instituted to approach the impacts of nursing IPs that invoked challenges to nurses with change. Many nurses expressed the importance of providing hands-on training during their IPs and alluded to self-motivation to gain such knowledge and skills when not accessible during their IPs. Despite creating challenges for nursing, it helped build their resilience, which became an essential tool for individual nurses to survive under challenging situations and thrive in the

future (Duncan, 2020; Leong & Crossman, 2015; McAllister & Lowe, 2012; Stephens et al., 2017; Veerapen & McKeown, 2021; Wong et al., 2018). Moreover, as Benner (1984) stated, the more frequently an individual was exposed to a situation, the better they reacted competently and confidently in those circumstances. Hence, nursing administrators and educators should look into organising more hands-on training during the transitional period to provide nurses with more practice.

Another practical implication was to address redundancy in contents in nursing IPs. Most nurses responded that this was an issue that led to overloading them with information that was not helpful towards their learning retention. Additionally, it deprived them of the much-needed hands-on skills required for their job. Monforto et al. (2020) expressed in the literature that eliminating content redundancies provided many aspects of educational opportunities. Aldosari et al. (2021) also described in their literature review that nurses who received adequate training before starting their new job roles found it redundant to go through IPs. It was because they had previously worked in the area and understood the unit's workflow and the job's requirements (Aldosari et al., 2021). However, as nurses in the mixed-methods study expressed, long IPs did not equate to better readiness for job competence and confidence upon IP completion.

Recommendations for Application

The mixed-methods study supported the need to acknowledge OR nursing IPs' impacts on perioperative NJNs in Singapore. These impacts were the form of challenges that affected their ability to function efficiently in their job roles and their capacity for knowledge and skills acquisition. Unknown to OR nursing management, educators, and NJNs, the impacts discovered in the study had causal effects on all parties. The recommendations that arose from the study were aimed at supporting Singapore OR nursing organisations to improve the structure of their IPs, encouraging NJNs self-initiative to partner with their OR

nurse educators, preceptors and management in their knowledge and skills acquisition, and, lastly, lessen the burden of nurses in their transition to practice or a new clinical environment.

Review the contents and delivery of OR nursing IPs in Singapore. The findings of the mixed-methods study called for the review of the contents outlined in existing OR nursing IPs in Singapore. While the survey respondents mainly acknowledged that they were satisfied with their OP, it was reflected by some participants in the face-to-face interview that their OPs were short, lacked content and were informal. It was also outlined in the quantitative survey that nurses faced challenges with knowledge and skills acquired during their IPs. The qualitative interviews explained that these were the results of overloading contents nurses felt were irrelevant to their job roles. However, when the contents shared were relevant to the job functions of an OR nurse, role ambiguity during the initial weeks of induction created uncertainty among NJNs. The extant literature noted that tailoring TSPs to acknowledge nurses' learning disabilities and needs showed better professional outcomes than unorganised TSPs (Strauss et al., 2016). Nursing researchers also believed that competent nursing care required time, appropriate recourses, and an appropriate and supportive learning environment (Crafoord et al., 2018; Graf et al., 2020). Monforto et al. (2020) also expressed in the literature that redesigning TSPs for new employees in speciality care areas to eliminate training information redundancies could improve nurses' ability to gain the appropriate knowledge and clinical skills to help transfer it to their assigned job role.

The recent literature provided some recommendations for the review of contents for OR nursing IPs. For example, Monforto et al. (2020) believed that instead of nursing IP facilitators teaching content based on personal experience, remediation should be made for instructors to deliver standardised content. The researchers also added the benefits of pre-test and post-test scores related to learning objectives (Monforto et al., 2020). Similarly, Blomberg et al. (2019) shared the recommendation for the need to have clinical competence

development to ensure competent patient care in the OR unit. Nurses acknowledged that supplementing them with such competence development after completing their IPs would equip them with the required competencies for their job functions. Woo and Newman (2020) added that to improve the transition of NGNs in Singapore, nursing faculties and healthcare industries should actively communicate to seek revision and align their prescribed programme contents relevant to current clinical needs and skill requirements. Other researchers in the literature also believed that healthcare organisations' efforts to re-evaluate their nursing IPs continuously were vital to keeping novice nurses updated with the latest evidence-based practices to allow competent patient care (Satku & Lee, 2016; Theisen & Sandau, 2013).

Recommendations arising from the mixed-method study sought to add to the recommendations in the extant literature and address the request for changes in current OR nursing IPs from nurses within the mixed-methods study. The contents of recent OR nursing IPs in Singapore could be recognised when healthcare organisations and nursing faculties were cognisant of the unique skills and knowledge required for OR nursing practice. It would allow them to focus on core nursing skills required for different OR nursing professionals and be flexible in delivering each core component. It was the opinion of multiple respondents in the study for less content bias as their IPs majorly cover the role of scrub and scout nurses. Nurses in the phenomenology study further elaborated that content overloading added pressure to their role ambiguity and expectations. The participants suggested that their organisations should have a more formal and structured programme for future NJNs to ease their transition to practice challenges. Thus, the researcher would recommend that health groups among the Singapore hospitals collaborate among their organisations to deliver similar content programmes. For example, providing an anaesthetic nursing theoretical content programme collaboratively on the same day as a health group to standardise content

and better human resource management for educators. It would also allow nurses to be more involved in the lessons as their content relates to their assigned job roles. However, it sufficed to say that OR nurses should be deprived of knowing the job functions of their other OR professionals by the segregation of participatory experience. The recommendations arose to help nurses adapt to their job role confidently and competently before progressing to learning different job scopes with OR nursing. Also, roles assigned should be notified before the commencement of work so nurses can clarify their roles and ease the pressure when starting a new job.

Next, the researcher would recommend having mandatory pre-test and post-test scores related to learning objectives as suggested in the literature. It would allow teachers and students to understand their learning needs and supplements as learning disabilities. Moving towards online learning for novice OR nurses was also recommended to instil self-initiative to explore the knowledge and skills required for their job role. One suggestion was to use an established online OR nursing foundational program such as AORN Periop 101, which has seen effectiveness as shared in the extant literature. Additionally, the researcher would recommend a review of the length of IPs currently delivered in Singapore. In the study, participants highlighted that their IPs were delivered as quickly as three days to a month. After this, NJNs were released to their clinical area to be part of the established workforce. However, as informed by the extant literature, for effective learning to occur, the length of IPs should be delivered between six months to one year (Baldwin, 2016; Kowalski & Cross, 2010; Chappy et al., 2016; Maxwell, 2011; Rush et al., 2013; Vortman & McPherson, 2021). Thus, the researcher would advise breaking down the content delivered based on foundational OR nursing knowledge and skills to expert level during the six months to one year. Understandably, it might raise concerns about human resource management and budget. However, the competent and confident nursing workforce should precede such matters.

Moreover, novice and experienced OR nurses would be able to build relationships within their OR and individualise learning needs when more time was given to adapt without the constraint of time (Nour & Willams, 2019; Strauss et al., 2016). Ankers et al. (2018) added in the literature that NGNs within their study expressed more confidence in their nursing skills after a 12-month transition to a practice programme. Other researchers also believed that a structured length of IP provided nurses with experience time to unlearn old cultures from the previous work environment and promptly learn and adapt to the new (Teoh et al., 2013; Yamaguchi & Sakai, 2019). However, the researcher would recommend segregating the IP delivery for the novice OR nurse and the experienced OR nurse due to the learning capabilities and needs of novice OR nurses. Additionally, rotation should be added every three to six months so that nurses can expand their foundational knowledge of their job role and acquire the necessary knowledge and skills at each rotation.

In-process new employees based on novice OR nurse and the experienced OR nurse.

The literature expressed that a novice OR nurse's learning capabilities and needs differed from that of an experienced OR nurse, as acquiring knowledge and skills to function as an OR nurse could take longer than in a commonly exposed nursing unit (Ball et al., 2015). As a precondition for all new employees to undergo an IP, the researcher would recommend that the human nursing resource group recruit nurses based on their nursing experience and induct them accordingly based on this structure. It would allow better time allocation and budgeting to move forward experienced OR nurses into the field faster than novice nurses. Within the phenomenology study, the experienced OR nurses expressed that despite the need to readapt to a new work environment, adapting could be smoothly overcome using their experience in different OR units. It mainly included adapting to the culture of the new work area. Therefore, for experienced OR nurses, the researcher would suggest a shorter time frame for their IP. The recommendation would be to organise a six-month transition programme. It

should include focusing more on confirming competence as an OR nurse through competency assessment at the level of OR nursing experience expressed during recruitment. Content such as the organisational structure of the new OR should remain available so nurses would be made aware of their team.

The researcher would also urge immigrant nurses with OR nursing experience to be inducted with locally trained OR nurses who had transferred employment. Because of their wisdom, locally trained nurses would possess local cultures and issues relating to patient care and team dynamics, and experiences could be shared with more dynamics, content and intent.

In contrast, many challenges presented for novice OR nurses, which later impacted their professional transition to OR nursing, as informed in the mixed-methods study. Thus, to add to the first recommendation, content delivered to the novice OR nurse should be structured, up-to-date, and delivered at a pace where learning retention and application would be present. Again, one tool that Singapore OR units could use to aid content delivery structure would be the Periop 101 programme, which was made available for all nurses regardless of geographical practice. Thus, by segregating in-process new employees based on nursing professional background, the researcher would trust that human resources and budgeting of processing new employees for training and development would improve.

Make available a new graduate programme for specialty care areas. The existing model of IPs in Singapore speciality care areas like the OR unit was structured based on designs that were content based on senior OR nurses' experience. It was similarly expressed by Monforto et al. (2020) to be ineffective. Furthermore, within the study, it has been identified that inconsistencies existed in duration, content, type of IPs provided, and formality. These findings were consistent with the extant literature noting that IPs could vary in healthcare institutes (Wong et al., 2018), content, duration and structure (Phillips et al., 2015). Although statistically, nurses within the survey study agreed that they found their IP to help prepare

them for their competence with their OR job role and found the job role assigned them to fit, there was nothing to validate their satisfaction with their IPs. It was later explained in the descriptive aspect of the study that regardless of what the nurses felt, ultimately, they had to build their self-resilience in their job and develop self-initiative to learn and develop their skills.

According to the extant literature, new graduate or transitional support programmes in countries like Australia and New Zealand have shown higher transferability of novice nurses' transition to local and international practice (Haggerty et al., 2010; Tuckett et al., 2017). Furthermore, it has shown confidence in retaining nurses within the organisation (Tuckett et al., 2017). Additionally, researchers pointed out in the literature that such programmes could vary in different healthcare institutes (Wong et al., 2018) in content, duration and structure (Phillips et al., 2015). Thus, the researcher would recommend that Singapore hospital organisations include a prerequisite for graduating nurses to express interest in pursuing OR nursing as a career when applying for a nursing role. Instead of current employment strategies to deploy nurses to different units based on the top few choices of their interest after their pre-registration competency programme, graduates should be thoroughly interviewed for the position and carefully selected. Once the suitable candidate has been successfully recruited, they should undergo a new graduate programme designed to help them with their first year of transitional practice in the OR. Besides, the researcher believed it would favour both parties if career aspirations were met early to inspire young nurses.

In addition, the researcher would suggest that recruitment strategies be revised to differentiate applying for a newly-graduated and experienced nurse job. It should meticulously include a clear heading of the position advertised, such as the ones seen with international nursing colleagues in Australia, the Middle East, the UK, and the US. Although it might present challenges in attracting interest due to the known culture of the OR unit, it

would help facilitate reducing hiring redundancies and loss of cost and training and development redundancies.

Devising the roles of mentors/preceptors. Participants in the mixed-methods study shared that mentors and preceptors were essential for them during their IPs. The literature shared that the availability of mentors in new work roles alleviated the potential challenges initially anticipated by nurses (Brown & Sorrell, 2017; Teoh et al., 2013). Additionally, the availability of good mentorships could help narrow the issue of theory-practice gaps and improve NGNs' adaption to the complex clinical environment (Hung et al., 2018). However, Tiew et al. (2017) expressed in the literature that even though providing a one-on-one mentorship programme was beneficial for new nurses throughout the first year of transition, there were concerns from the hospital regarding the cost and resource utilisation to facilitate such a structure long-term. An earlier study expressed the same view regarding concerns over cost utilisation to provide extra supervision to new employees (Maguire, 2013).

Within the mixed-methods study, although issues such as cost utilisation were not raised as no nursing management team was involved, NJNs expressed that aside from the warmth and supportive nature of their resource persons, such as IP facilitators and attachment mentors, some of the resource persons were unsure of the contents they should be sharing during clinical rotations. Statistically, it was similarly observed that most NJNs felt that their facilitators guided them well during their IPs. However, it was observed from the statistics that NJNs faced some challenges in understanding concepts and seeking clarification on the topics covered during and after their IPs. Thus, the researcher would recommend devising the role of mentors and preceptors to improve relationships and teaching delivery towards NJNs in the unit.

Firstly, the researcher would urge nursing management, educators, and policymakers in Singapore nursing units to re-evaluate the utilisation of their clinical nursing staff currently

precepting and mentoring new employees or employees new to a clinical position. Additionally, to resolve the concerns of cost and resource utilisation, as raised in the literature, the researcher would recommend slimming down the number of experienced nurses to precept and mentor new staff. Although clinical educator roles such as clinical instructors, nursing preceptors and nurse educators were already available, they should be reassessed for their competency in their guidance. The researcher would suggest introducing proper clinical guides in the OR unit aside from the principal nurse educator providing foundational knowledge and skills during IPs. The role of concern would be the clinical nurse specialist (CNS). This group of nurses were described in the literature as advanced practice nurses in the clinical area who have achieved the aptitude, knowledge and skills of their professional nursing role at greater depth and breadth than an ordinary nurse (Chan & Holly, 2021). Providing the availability of such a position would help boost the structure of specialised areas such as the OR unit, which has seen its effectiveness in Western societies such as Australia, the UK and the US. Thus, the author would advocate opening such positions in specialised areas and abandoning redundant places that have not been effective in accommodating a conducive clinical learning environment.

Introducing this new role in the Singapore OR nursing profession should clearly outline the requirements to apply for the position. It should include a minimum of years of experience as an OR nurse, specialist qualifications in speciality care areas and a comprehensive understanding of the care requirements associated with the specialist role. The researcher would further express that such positions would be speciality-based, such as CNS for neurosurgery and spine surgery. The CNS's guidance would come from a nurse with extensive knowledge of that discipline. Thus, the job application requirements for the CNS role should include relevant recent experience.

Recommendations for Future Research

Existing literature demonstrated a need for a more structured OR nursing programme and an adequate ratio to balance NJNs of experienced OR nurses and novice OR nurses to ensure the proper support (Innes & Calleja, 2018; Pupkiewicz et al., 2015). Additionally, researchers expressed in the literature that there has to be a need to focus on the return on investment of IPs in specialised areas such as CCU to determine the long-term cost (Innes & Calleja, 2018). Eriksson et al. (2020) also expressed in the literature that future research should focus on exploring the time provided for newly-trained OR nurses to provide better care for OR patients.

The mixed-methods study focused on the need to explore the impacts of nursing IPs on NJNs in Singapore OR units. In the study, nurses explained that the challenges they faced contributed by issues with their IPs were multifaceted. First, issues related to knowledge and skills acquisition and, later, their ability to function efficiently in their job roles were widely explored and discussed within the study. As highlighted in the literature, such issues within the nursing profession should be acknowledged quickly as its workforce has struggled to meet the demands of current healthcare needs and infrastructures. In reflection on the processes adopted in the study that led to its findings, some limitations and strengths were disclosed. These were essential considerations as they provided the canvas for future research recommendations supporting existing literature recommendations and their gaps. The study suggested that IPs delivered in current OR units in Singapore would require re-evaluation to fit into a volatile healthcare setting. Directions for future research should address the multifaceted issues in OR nursing and embrace that, in time, perceptions and needs that the OR nursing profession warrant changes. It would be especially vital for the Singapore nursing workforce as it would try to recover its force loss due to the pandemic.

The first recommendation for future research was to adopt simple random sampling to give subjects within the study's inclusion criteria an equal chance to input their opinions and insights regarding the phenomenon. Moreover, it would help to reduce sampling errors and bias by selecting the studied population using randomisation (Rahi, 2017; Willson & Stonecypher, 2015; Hill & Dever, 2013). Although simple random sampling was not accessible for the study due to timing and failed partnerships by the local hospitals to act as gatekeepers, future studies could focus on approaching the method when interest in the phenomenon would arise to partner with local hospitals.

The study used alternative sampling methods to gain access to information to contribute to the research. It was characterised by 96 participants in the survey study, of which 91 met the description of the inclusion criteria. It was 20% less than the goal planned for sampling recruits for the quantitative survey despite exhaustive efforts by the researcher. However, due to the restrictions and accessibility to reach participants, the researcher expressed that the recruitment number was rich. Potential conditions such as available subjects not wanting to participate and the lack of NJNs posted to OR units due to deployment of staff to other departments as elective surgeries were reduced or stopped. Thus, it was beyond the researcher's jurisdiction. Although eventually, the researcher went to cover all health groups to reach out to gatekeepers for more participants; the generalisability might have been compromised as the final sample size was not representative of the entire OR NJNs population in Singapore. Researchers have expressed in the literature that a smaller sample size faces issues with generalising its results (Baker & Alghamdi, 2020; Ow Yong & Cameron, 2019).

Furthermore, recent researchers who adopted a convenient sampling method expressed in the literature that future research should explore a more appropriate one, as using a convenient one might restrict generalisability (Chen et al., 2021; Casey, 2019).

However, the study's author argued that the findings were detailed regardless of the small sample size obtained, as it captured most of the OR NJN population when the study was undertaken. Nonetheless, the researcher recommended re-organising the sampling frame to get a more accurate sampling size before undertaking future research, as the survey was easy to replicate. The intention of disseminating the study findings to the more significant OR nursing population in Singapore was to acknowledge their challenges with the transition to practice and the impacts they faced. Thus, there was a greater need for future research within the Singapore context to address the area of sampling size if succession planning to improve the state of novice OR nurses' struggles were to be addressed.

Furthermore, as mentioned when the study was undertaken, the healthcare system globally was undergoing immense pressure to operate, and the allocation of staff was generally focused on areas where healthcare was urgently required. Therefore, insights generated within the study might have only been able to generalise within the circle of the crisis. Thus, future research should explore similar phenomena regarding the study once the healthcare system has stabilised to pre-pandemic times and possibly explore the difference.

The recommendation to acknowledge a better sampling size would further help develop the IORNTSP survey. The aim would be to recruit enough participants to perform a valid EFA and CFA, which the survey study could not achieve. Thus, it was warranted that the study be replicated. Although Cronbach's alpha of the subscales was performed for the instruments and met the standards of reliability, an EFA and CFA would have helped boost the reliability of the IORNTSP survey further by understanding its constructs and the existence of a relationship between the observed variables and their underlying latent constructs (Kalkbrenner, 2021; Peixoto et al., 2022; Tabachnick & Fidell, 2014). A content validity test with expert panels should also be reapplied before conducting the study to

establish face and content validity (Ikart, 2019). After these processes could be achieved, the study should be replicated.

Next, after a better overview of how participants respond to questionnaire surveys and advice from expert reviews, a follow-up study should explore the modification of the IORNTSP survey. It should include rewording the questions to make unduly lengthy questions shorter to provide clarity. Also, it was recommended that items be clustered according to the theme of questions to offer continuity in questions. It would intend to provide consistency in the thinking process of participants and make it more engaging to continue with the survey. Future research should also probe into the section where 'N.A.' was selected. Within the study, it emerged that some participants selected the option for specific questions despite not applying it to others that were similar. Although it was understood in the survey questionnaire instructions that the option existed, it was only applicable if a specialised IP was not undertaken.

Future studies should also explore the updated factors with regard to questions in the IORNTSP survey. As Casey (2019) expressed, all survey instruments would require refinement in their contents to input new information explored. Thus, the researcher has recommended future research to input new issues explored relating to IPs' impacts on OR nurses. Furthermore, new issues might emerge as the study was undertaken during a pandemic. Thus, it was warranted that these issues be explored and acknowledged. The survey should also include exploring the difference between agreeing to a statement and satisfaction regarding an issue associated with the question. Within the survey study, the IORNTSP survey focused on agreeing statements for specialised IP questions and satisfaction rates on OPs. Thus, a limitation existed in understanding this phenomenon. With a better structure, the future IORNTSP survey or survey with a similar structure would be able to understand better the relationship between agreeing with an issue and how satisfied one was.

Subsequently, the researcher would recommend future replication of qualitative research on the study phenomenon to strengthen participant recruitment by evenly rationing NJNs' backgrounds. In the qualitative study, the researcher was able to recruit eight participants as planned and reached data saturation after the end of the fifth interview. The rest of the participants continued to be interviewed to probe for further insights. However, it was futile. The researcher believed this issue could be addressed in future research as most of the NJNs interviewed were OR nurses with experience who had moved to a new job. Although they helped to facilitate data collection as they were of the relevant population group that provided rich and thick verbatim (Noble & Smith, 2015; Onwuegbuzie & Collins, 2017), it was mainly saturated to the view of an experienced nurse comparing adaption to a new clinical environment.

Furthermore, the study cannot be generalised as it was undertaken during a significant health crisis which changed the structure of IPs delivered. Nonetheless, it was not the intention for this study to be generalised. As Ow Yong and Cameron (2019) expressed, this was so because of the inductive nature of qualitative research. Also, as healthcare industries have learnt during recent global pandemics, the cultural shifts of how healthcare functions must be transparent to better the workforce. Researchers also expressed in the literature that changes over time in evidence-based practices (Dolezel et al., 2021; Elhami et al., 2018) and advancing technologies (Kavanagh & Szweda, 2017; Phillips et al., 2015; Theisen & Sandau, 2013) means perceptions were due to change. Thus, contents shared during IPs and nurses' perceptions and how it impacted them remain volatile. However, if the structure of IPs were solid, such issues could be overcome. Future research to invest in the study's topic could further explore NJNs' insights and insights of NJNs of different nursing generations necessary to find solutions to address cultural shifts in the healthcare state.

Next, the researcher would recommend that future qualitative researchers gather more descriptive data when administering the interview guide. It should include modifying the question structure to avoid participants providing partial or single-word responses such as “yes” or “no”. Breaking down questions into parts would also help participants process the questions and give a more in-depth answer. It would also benefit future researchers when interviewing capture responses better. Thus, revising the interview guide might yield more insights and strengthen responses from prospective participants. A mock run of a modified interview guide should be administered to observe if responses were sufficient to answer meaningful questions. The discovery of the themes and subthemes in the qualitative study were believed to be expandable with future exploration regarding acknowledging the impacts OR nursing IPs had on the nurses' profession. It was because participants in the qualitative research of the mixed-methods study were not representative of the significant OR NJNs population in Singapore. Furthermore, it would help bridge gaps from findings in the study and the extended literature and propose a better strategy to strengthen the workforce of future generations.

Fourth, future research was warranted to explore two cohorts of NJNs, NGNs and newly employed experienced OR nurses in Singapore. It would allow healthcare institutes and their human resource and development departments to respond better to the induction structure for specific groups. The study has identified that the IPs NJNs received might not have fully helped them with their challenges. Issues similar to those expressed in the literature, such as OQN challenges in language barriers and cultural disparities, were observed in the qualitative study (Ohr et al., 2016; Zanjani et al., 2018). Moreover, issues nurses of different OR backgrounds face might differ.

Furthermore, participants in the qualitative study stated that they constructively faced these challenges differently, using their self-reliance to build resilience and self-learning

motivation. Gaining a better understanding of individualised groups might help guide healthcare institutes to fill in those gaps and provide a better transitional support programme to each group. The study's findings confirmed and added to existing literature call for addressing issues with IP delivery to be specific and fitting to nurses' level. Thus, future research exploring the phenomenon in healthcare institutes should consider restructuring their recruitment and IP delivery models. Also, whether healthcare organisations in Singapore could adequately support the changes reflected in the study and the broader literature might impact the outcome of existing and future research. Furthermore, as the Singapore healthcare workforce would be trying to revive its nursing workforce, it would rely upon the availability of resources and budget to administer such changes quickly.

Fifth, future research within the Singapore nursing context could explore more insights concerning OPs provided to speciality care areas and their impacts. The mixed-methods study shared findings similar to the extant literature about the positive satisfaction rate with OPs (Al Awaisi et al., 2015; Hussein et al., 2016). Future researchers should look into how nurses in Singapore view their speciality care OPs and review their effectiveness for job preparedness. Within the survey study, it was observed that most respondents were satisfied with the overall delivery of their OPs. However, how it later helped them build the foundation when they returned to their assigned wards was unknown. Understanding the transitional effect of nursing OPs to IPs in Singapore hospitals would help understand its effectiveness, usefulness, and redundancies. The literature also recommended that such studies be administered within three months of nurses' start day so that the experience remained green with fewer lapses (Innes & Calleja, 2018; Lindfors et al., 2021). Thus, it would provide more depth into the phenomenon.

Lastly, the researcher would recommend that future researchers undertake similar phenomena using a longitudinal approach. Many nursing researchers expanding gaps in the

literature or exploring native topics have similarly recommended undertaking longitudinal studies to explore their findings in more gaps (Baker & Alghamdi, 2020; Chen et al., 2021; Numminen et al., 2016). It was because a longitudinal study provided a better outlook of giving insights into a phenomenon to be observed and understood over time (Aspers & Corte, 2019; Cheng et al., 2014; Onwuegbuzie & Collins, 2017). Additionally, the multilevel analyses allowed for better comparisons of effect changes over time (Aspers & Corte, 2019; Johnson & Benham-Hutchins, 2020; Onwuegbuzie & Collins, 2017). Within quantitative studies, longitudinal methods have been used to administer the same survey to identify changes in the studied topic (Bhattacharjee, 2012). Thus, it would aid in observing if responses change over time with the same survey. In contrast, qualitative longitudinal studies allowed unexpected events to be captured over time (Aspers & Corte, 2019) and provided thick data descriptions (Onwuegbuzie & Collins, 2017). For example, in Cheng et al. (2014), a longitudinal study was used to understand the relationships between NGNs' clinical competence, clinical stress and intention to leave. The findings from the study confirmed gaps in previous literature, thus providing its explanation.

On the contrary, researchers using cross-sectional studies have recommended using longitudinal studies to expand on their findings (Baker & Alghamdi, 2020; Numminen et al., 2016). As explained, it provided more insights into the causal relationships of variables (Baker & Alghamdi, 2020; Numminen et al., 2016). Similarly, future longitudinal research was recommended to explore the effect of the study over time. As the study was a first of its kind in a Singapore OR nursing context, it would be interesting to investigate changes in the phenomenon. However, Cheng et al. (2014) expressed that longitudinal studies might not sufficiently understand a phenomenon in-depth. Therefore, future studies should be undertaken to explore it in more depth, such as using a comparative study to observe group comparison (Cheng et al., 2014). Cheng et al. (2014) view was similarly shared by the

researcher, as expressed earlier in this section, that future research was required to explore group comparison perceptions regarding the study's phenomenon.

In summary, the recommendation for future research that the researcher has provided was to give insights into the gaps in the study. As researchers in the literature expressed, future research on similar topics was essential to clarify the matter. Furthermore, with generational change, perceptions of a phenomenon would change. Thus, perceptions would remain volatile in research, especially in the undertaken feedback study. Finally, issues relating to sampling size should also be addressed in future research to provide more generalisability and representation of the Singapore OR nursing population. Within the study, generalisability was challenging due to the small sample size.

Furthermore, it was affected by the timing of undertaking the research. Also, the representation of the population in the qualitative study was not balanced. Nonetheless, bearing all the circumstances, the study's findings could be generalised within its circle of time. Thus, it provided future research to compare to the study's findings. Considering that the study probed such matters in Singapore OR nursing, future exploration regarding the speciality within a Singapore context was limitless. Exploring the phenomena of the study in a longitudinal study would also give the nursing profession in Singapore the generational shifts of its vocational career and the need to strengthen its workforce.

Conclusions

The researcher undertook several processes to immerse into the phenomenon. Firstly, in Chapter 1, an overview of the country of research was shared, and the demographic of the nursing profession in Singapore was outlined. The researcher later outlined the statement of the problem for the study, the purpose, aims and objectives. The nature and significance of the study were also outlined before the research questions and hypotheses were presented. Chapter 2 focused on a thorough literature review to digest existing studies concerning the

research topic. Chapter 3 followed a discussion of the study's research methods and data collection process. Next, Chapter 4 focused on the discussion of the findings, and lastly, Chapter 5 provided the recommendations for practice and future research and its implications. Finally, the study's conclusions will discuss the research's take-home message and explain what the results mean concerning the theory and conceptual framework adopted for the study and prior research into OR nursing IPs for NJNs.

The explanatory sequential mixed-methods design study aimed to explore the impacts of nursing IPs on NJNs in Singapore OR units to prepare nurses better to provide competent OR nursing care. These included being competent in their job roles by acquiring sufficient knowledge and skills at the level and whether the assigned job role fit. Before the study, the impacts of OR nursing IPs on its NJNs was unknown within the Singapore OR nursing context. Additionally, Innes and Calleja (2018) expressed in their integrated review of the literature the lack of research focus on the transition of NGNs and novice nurses in critical care areas like the OR. The broader literature that has explored the phenomenon shared some common impacts that affected the transition to the practice of OR NJNs. These included challenges to return demonstration of skills due to lack of exposure day (Pupkiewicz et al., 2015), high expectations by senior nursing staff (Wilson, 2012), poor stress management skills (Işık et al., 2020; Wang et al., 2016), lack of time to expand in OR clinical competence due to work hinders and habits in the OR unit (Blomberg et al., 2019), and lack of collaboration between nursing academia and healthcare institutes (Beitz, 2019; Crafoord & Fagerdahl, 2017).

The availability of TSPs, such as OR IPs, thus became a cornerstone to help build the foundations of nursing practices. However, the problem arose when healthcare institutes tried to compress the knowledge and skills of perioperative nursing into NJNs OR IPs. The study has reflected that it was not feasible. The extant literature expressed that it was because

knowledge and skills of vocational professions like nursing require months and years of training to be attained and proficient (Ball et al., 2015; Martin, 2011; Sherman, 2015). Furthermore, the knowledge and skills were manifold (Ingvarsdottir & Halldorsdottir, 2017). It was worsened by the lack of exposure to OR nursing during student nursing placements and classrooms (Foran, 2015; Elley, 2016; Vortman & McPherson, 2021). Therefore, it could not be comparable to nursing competencies assessed during student nursing as it carried different roles and responsibilities (Hillman & Foster, 2011; von Vogelsang et al., 2019). The significance of the study was, therefore, paramount.

The study, which used an explanatory sequential mixed-methods design study to explore its significance, involved a cohort survey study for the quantitative research and a phenomenology study for the qualitative research. A total of 91 valid respondents' responses were analysed from the 96 respondents from the survey. Eight participants were later interviewed for the qualitative study. The SPSS version 28.0.1.1 software was used to analyse the quantitative data, while the six-step thematic analysis designed by Braun and Clarke (2014) was used to analyse the qualitative data. Data triangulation was achieved in the mixed-methods research using multiple data collection methods. Findings from both methods were later used for comparison to provide a more precise explanation of the study's phenomenon. The study's results helped answer the research questions and hypotheses and, importantly, the objectives outlined in Chapter 1.

Objective 1 - Explore the impacts current OR nursing IPs in Singapore OR units had on its OR nurses. The study's first objective was to explore the impact of current OR nursing IPs in Singapore OR units on its OR nurses. In this situation, the researcher wanted to examine the effects of IPs on OR NJNs in Singapore. In the study, objective one was met as participants rated two measures the researcher designed in the IORNTSP survey. These included behavioural presentations, effects, and types. Of the 91 respondents, 86 responded

that they received OR specialised IPs. The quantitative study revealed that respondents answered that the IPs they underwent were specific to their job roles, covered all job roles in the OR unit and were mainly 1- 4 weeks long. The findings in the quantitative study also reflected that nurse educators with an advanced diploma in perioperative nursing were mainly the personnel who facilitated their IPs.

Similarly, a high percentage of nurses expressed that they did receive OR specialised IPs in the qualitative. The timeline of their IPs was similar to the findings in the quantitative results. Although the percentage of responses reflected the availability of OR-specialised IPs, participants expressed many challenges that impacted their job roles. The qualitative findings found six themes that impacted OR nurses with unit IPs.

Firstly, the central challenge nurses responded to in the survey was reaching a competence level during probation due to a lack of resources. It was similarly expressed in the qualitative research that the problem with the lack of resources during their IPs later impacted their ability for purposeful knowledge and skills acquisition. Participants said acquiring the correct knowledge and skills was essential to help them function efficiently in their assigned roles. The lack of learning exposure, retention, and reflection was an obstacle to achieving knowledge and skills acquisition. The theme implied that nursing management and educators should be more aware of the resources provided during IPs. The study reflected that more resources, such as time and content, did not correlate to learning exposure strengths. It was because when content became repetitive or out of scope, participants lost interest, resulting in reduced learning retention.

According to the literature, repeating content in IPs was frustrating for nurses (Monforto et al., 2020). It was because it did not help provide a variety of learning and dismissed the purpose of IPs, knowledge, and skills acquisition. On the other hand, researchers expressed that the lack of resources might hinder nurses' ability to provide

competent patient care (Crafoord et al., 2018; Odland et al., 2014; Spruce, 2019). Being cast out during their transitional period did not help in the matter either (Odland et al., 2014). Additionally, researchers shared in the literature that technological advances hindered novice nurses' ability to make clinical judgments and confidence (Kavanagh & Szweda, 2017; Phillips et al., 2015; Theisen & Sandau, 2013). The data analysed in the survey showed that the lack of exposure to technical skills was exceptionally high. It later affected NJNs' ability to seek clarifications and understand concepts during and after their IPs. The qualitative findings reflected a more detailed explanation of the quantitative results. Firstly, learning exposures and retention differed between an NJN entering the profession and nurses with past experiences in other areas of the nursing discipline or OR nursing. Experienced nurses used their past experiences to compensate for the shortcomings during their IPs. However, all nurses expressed that they took the initiative to seek information lacking during their IPs after completing them. These included exposure to the clinical area and self-reading to understand vague concepts. In addition, clinical work rotation within the OR, buddying with senior nursing colleagues, and teach-back sessions with other colleagues helped OR NJNs improve their skills and knowledge acquisition capabilities. Thus, it implied the importance of good knowledge sharing (Cook, 2016) so NJNs could gain clinical competence and confidence during the transition period (Boyer et al., 2018).

The findings of the survey study further reflected three issues that impacted OR nurses with IPs. These included the quality of IPs received, adapting to a new clinical environment and availability of resource persons. These impacts were contributors to knowledge and skills acquisition. NJNs noted the importance of having well-informed facilitators as it would affect the quality of the IPs received. It was because the information provided by some facilitators was essential to these nurses to survive in their professional roles. As a result, they were more able to build resilience as they took the vital tools shared

by well-informed facilitators regarding professional practice survival. It helped explain the quantitative findings that saw a high response rate relating to good guidance from the facilitator. Moreover, it enabled them to adapt to their new clinical environment more smoothly as they were personally introduced to their colleagues and was identified as a team member after finishing their IPs.

The literature expressed that as theoretical knowledge and practical skills imparted in student nursing are quickly becoming outdated or irrelevant in current healthcare settings (Chen et al., 2021; Dev et al., 2020; Graf et al., 2020), IPs arguably became the cornerstone for nurses' professional development during their transition period (Pertiwi & Hariyati, 2019). However, as challenges broaden in speciality care areas as high-stress clinical units reduce practical skills involvement opportunities (Smith et al., 2015a; Smith et al., 2015b), resource persons became vital to nurses' transitional period (Hussein et al. 2017; Teoh et al., 2013; Tiew et al., 2017; Wong et al., 2018).

Objective 2 – Explore the effectiveness of current perioperative IPs for NJNs in Singapore OR units. Findings in the mixed-methods study indicated that the current perioperative IPs administered to OR NJNs were effective in multiple aspects. The quantitative survey revealed that nurses agreed that after undergoing their IPs, the assigned job role fitted them. Also, most nurses agreed that the IPs they experienced helped prepare them for their job competence. The results were positive despite some variance seen in the responses regarding challenges faced by OR NJNs during and after undergoing their IPs. It was found that nurses mainly faced difficulties with their skills after their IPs as there was a lack of exposure to skills exposure.

Moreover, the results indicated that nurses faced challenges seeking clarification and understanding concepts before and after their IPs. Also, nurses indicated the challenges to adapt to their new roles due to the lack of time given for adaptation, lack of resources to

reach competence level during their IPs and lack of content provided to function in their job role. However, the results showed that nurses were given sufficient time to reach competency before role confirmation and were assessed on their knowledge and skills during their IPs. Moreover, the results outlined that nurses were guided well by their facilitators and acknowledged as part of their assigned team after their IPs. The results also highlighted that most nurses could combine theory and skills after their IPs. Thus, the results from the survey study implied that despite challenges nurses might face during their transition period and the shortcomings of their IPs, it was vital that they were given time to reach their competence before they were confirmed and have facilitators to guide them well throughout their IPs. Although it might affect their competence and confidence, their experience during their IPs managed to break through barriers of challenges that impacted them after their IPs. The qualitative results similarly indicated the importance of having well-informed facilitators share the topics related to OR nursing during the IPs. Nurses also expressed the importance of providing feedback and having open discussions after lectures to help reduce challenges that might arise after their IPs in their ability to perform their job roles. However, nurses mentioned that their resilience and initiative to seek clarifications reduced the challenges that impacted them after their IPs. Thus, the results from the qualitative study implied two effects of OR nursing IPs in Singapore. Firstly, the challenges nurses faced helped them build resilience. Secondly, it created self-initiatives for nurses to learn and make professionally. Hence, it implied that for IPs to be effective, learners must also be responsible for their professional development and knowledge and skills acquisition.

According to the literature, despite well-designed IPs, nurses would still face challenges because of the lack of support received during their transitional period (Graf et al., 2020). Marks-Maran et al. (2013) stated that constrained relationships between nursing preceptors' relationships with preceptees further deteriorate the matter. The lack of time and

different shift allocation with their preceptors were challenges met when trying to fulfil their learning needs (Hussein et al., 2017; Marks-Maran et al., 2013; Wong et al., 2018). Thus, these issues have highlighted the importance of devising preceptors' roles and allowing hospital administrators to be more accountable for meeting NJNs' learning needs and disabilities by scheduling regular feedback sessions (Wong et al., 2018). The literature also pointed out resilience was better when nurses underwent self-directed online learning (Nash et al., 2018).

Furthermore, OR nurse educators could monitor novice OR nurses' progress (Byrd et al., 2015). Also, OR nurses could validate their knowledge and skills during clinical nursing rotations (Tschirch et al., 2017). Thus, the researcher believed IPs could be effective when the correct tools were inserted into their structure. However, the extant literature highlighted that many who faced challenges that later impacted them in the job in this study expressed that hospital administrators could do more to help future OR NJNs. It included reducing redundancies in contents and establishing better structure in IP deliveries.

Objective 3 – Understand the different group experiences of OR nurses who were given the structured IPs versus the ones who did not. Based on the study's findings, the different groups of OR NJNs experience various challenges impacting their ability to function in their job roles and acquire knowledge and skills with and without IPs. Firstly, the Mann-Whitney *U* Test revealed an insignificant difference in Singapore OR NJNs with specialised OR IP and those with none. Hence, this suggested challenges that impacted Singapore OR NJNs with the ability to perform their job roles were not directly influenced by whether they received a specialised OR IP and those with none. Nonetheless, for nurses who did not receive IPs during the transition, OPs were still made available to them. Mainly, nurses in the study found that their OPs were helpful during the onboarding period. For nurses with IPs, experiences could be compared among age groups, educational status and

novice versus experienced OR nurses. Again, the findings revealed an insignificant difference in experiences between the different groups. However, based on the open-ended responses in the survey, participants stated that the IPs they experienced emphasised the roles of scrub and scout nurses rather than equally sharing about other nursing roles in the OR. Hence, it implied that nurses who were not scrub and scout were likely to benefit less during the programme as they suffered from the lack of content of their roles. Participants in the qualitative study did not raise such issues. They did, however, share more regarding the approach they received to gain more insights into their job roles. Participants expressed the difference between receiving formal and informal IPs. Formal IPs were more dynamic and content-heavy. However, it did not mean that it benefited nurses fully. Nurses expressed that content-heavy IPs became a burden because they could not register overloaded information, thus resulting in low learning retention.

Furthermore, role ambiguity in the initial months of work made them unsure of what knowledge and skills would be helpful to gain and retain to get through their probation period. It implied that the quality of formal IPs had to be looked into for their effectiveness. However, nurses' experiences with informal IPs were more prominent for those already with experience. The nurses interviewed expressed that they went into their IPs quickly, and their expectation to perform in their job roles was higher due to their known OR nursing experience. To overcome such issues, experienced OR nurses lean on past knowledge of the structure and function of OR nursing. Ultimately, both groups were required to adjust and adapt to their new job roles.

The extant literature shared findings similar to those of the study. Researchers expressed in the literature that time was an essential factor for nurses to adjust and adapt to their new professional role or environment (Baldwin et al., 2016; Kowalski & Cross, 2010; Chappy et al., 2016; Maxwell, 2011; Rush et al., 2013; Strauss et al., 2016; Vortman &

McPherson, 2021). Time would support NGNs' ability to formally connect with their work peers and build on individual needs within the new clinical environment (Nour & Willams, 2019; Strauss et al., 2016). Furthermore, even with professional experiences, nurses must unlearn old cultures and promptly learn the new in their new workplace (Teoh et al., 2013). The importance of unlearning old cultures was not to undermine experienced nurses' capabilities but to help benefit from gaining new knowledge in a different setting (Yamaguchi & Sakai, 2019). Singapore nursing literature reflected concerns among nurses for failing to successfully transition after their probation period (Woo & Newman, 2020). As nurses were offered scholarships and sponsorships as student nurses by the local hospitals, there was a required bond with the local hospital sponsor for a period ranging from three to six years to be served (Chua, 2020; Woo & Newman, 2020). Hence, nurses feared the need to repay these scholarships or sponsorships if they were deemed unfit for their assigned roles. However, such issues were not raised or expressed in the study. It implied that these practices were not significant issues that created fear among nurses in the study as they learned to overcome challenges during their initial transitional period without carrying such concerns. It also suggested that if such issues were not used as threats to nurses to improve their performance, nurses would be able to build resilience and self-learning capabilities when faced with a crisis.

Objective 4 – Explore the potential benefits of having a structured perioperative nursing IPs for ENs and RNs. The study identified some potential benefits of having structured perioperative IPs for nurses. Firstly, the quantitative study results indicated that having a structured OR IP helped prepare them for their job role. Secondly, after undergoing their structured OR IPs, the results suggested that the job role assigned fit them. The survey results revealed that the overall positive review of OR IPs was regardless of some challenges they faced during and after their IPs. Some patterns from the survey results indicated that

having structured OR IPs benefited nurses and the organisation. A strong, well-versed facilitator helped nurses ease their struggles during their IPs. The interviewed participants expressed that survival guides that were shared during IPs by the facilitators helped NGNs navigate through the challenges faced during and after their IPs. It included building self-resilience towards the roles and motivating nurses to adapt self-learning capabilities to seek knowledge and skills required for their job roles. Hence, the main benefit of structured OR IPs observed in the study was the challenges faced by nurses that impacted them in their jobs and were used as a tool to perform better.

The literature shared that having a structured nursing IP remained challenging due to staffing shortages to deliver the programmes (Odland et al., 2014). However, made available and with suitable delivery, nurses expressed the correlation to having a positive experience with adaptation, work satisfaction, and support system (Strauss et al., 2016). Nurses also felt more confident with their nursing skills 12 months after undergoing transitional programmes (Ankers et al., 2018). Additionally, immigrant nurses also find such programmes to be very useful in understanding the cultural diversity and differences in nursing practices of their new country of practice (Ohr et al., 2016; Zanjani et al., 2018). Hence, it was essential for nursing administrators globally to emphasise such programmes for immigrant nurses due to the diversity in the healthcare workforce. It would help immigrant nurses transition better and provide care appropriately based on cultural beliefs and practices.

The study revealed several factors to help OR NJNs in Singapore overcome the impacts they had after undergoing their IPs. In light of the objectives presented in the previous sections, the theoretical foundation of Benner's From Novice to Expert theory and Warren and Mills's Conceptual Model of Nursing Motivation that was built upon for the study helped accomplish the study's original research purpose: explore the impacts current OR nursing IPs in Singapore had on its NJNs as a result of the challenges they faced during

the IP period to better prepare nurses in providing competent OR nursing care. Despite having insignificant differences in the challenges faced by NJNs of different groups that impacted them after their IPs, experienced nurses had fewer issues adapting to a new OR unit than novice OR nurses. Furthermore, OR nurses with more years of working experience were more resilient towards independently nurturing their skills. The study's findings supported Benner's theory as it clearly outlined the different stages individuals would undergo to acquire skills and knowledge. Using Benner's theoretical framework as a guide has helped the study justify the concept of systemic skills acquisition (Whelan et al., 2016). Brown and Sorrell (2017) also expressed in the literature that systemic skills acquisition parallels all levels of nursing expertise when learning a new skill. Previous researchers have also mentioned in the literature that Benner's work has helped emphasise the need to improve the development and structure of employee transitional programmes (Dumchin, 2010; Horwarth, 2010). These areas were all observed in the study, implying the significance of Benner's work in nursing research when trying to understand nurses' experiences with knowledge and skills acquisition.

On the other hand, Warren and Mills's work helped the study understand the importance of motivation to self-develop and improve in the vocational profession. Although in their work, Warren and Mills (2009) shared organisational rewards and incentives as a canvas for individual nurses to action their motivation, the personal characteristics shared were more relatable in the study. These included areas related to role identity and value. The mixed-methods study revealed that when nurses felt valued as team members, their challenges became second nature, motivating them to acquire the knowledge and skills required for their roles. Hence, it implied that OR NJNs in Singapore were committed to the job assigned to them.

The mixed-methods study has contributed to the practice of OR nursing in Singapore by highlighting the importance of having structured OR IPs. Nurses in the study pointed out the importance of providing hands-on training during their IPs. Unknowingly, depriving nurses of such training pieces has alluded NJNs to self-motivation to gain the knowledge and skills that were not accessible during their IPs. Furthermore, despite the challenges encountered, resilience was built to overcome the impacts, which became an essential tool for individual nurses to survive when faced with challenging situations and thrive in the future. The researcher would recommend that the study be replicated with a better sampling size and that a longitudinal approach be used to explore a similar phenomenon. Also, the researcher would recommend modifying the IORNTSP survey to better suit current issues in the clinical areas and cluster questions according to the theme to provide continuity in responding. Lastly, the researcher would suggest a more diverse sample when applying qualitative research to explore this study in more depth in the future.

Executive Summary

This explanatory sequential mixed-methods study explored the impacts of OR nursing IPs on NJNs in Singapore OR units. Consequently, the study arose from a limited understanding of OR nursing IPs made available for OR NJNs in Singapore. The author observed that the extant literature has reported that OR units were trying to compress the knowledge and skills of perioperative nursing into NJNs OR IPs within a few weeks, which was not feasible for novice OR nurses to acquire knowledge and skills to be competent in the roles. Research has indicated that such knowledge and skills would require months and years of training to be attained and proficient (Ball et al., 2015). Accordingly, the author outlined two research questions seeking to answer questions regarding the phenomenon.

The mixed-methods study included two phases, which used two self-developed instrument tools. Phase one used a cohort survey study administered online via Google Forms

to collect data from 91 Singapore OR NJNs using a 42-item questionnaire survey named the IORNTSP survey. In the second phase, eight nurses from phase one were recruited for a Zoom interview to gather more insights regarding the main findings from phase one using a phenomenology study design.

Data analysis for the quantitative research was completed using SPSS Statistics version 28.0.1.1. It included descriptive analysis, measures of central tendency, regression analyses, Independent T-test and Spearman's correlation. The independent T-Test to answer RQ1 highlighted no significance in knowledge and skills acquisition for those with or without IPs ($p = .679$). The Spearman correlation test to further answer RQ1 reflected no significance and a weak positive relationship between not receiving necessary and sufficient technical skills with putting theory into practice ($rs = .14, p > .05$). On the other hand, RQ2 was analysed using multiple and single regression analyses. The results revealed that the overall helpfulness of IP in preparing OR NJNs in their ability to perform their job roles was dependent on five variables. These included the facilitators' guidance and challenges because of a lack of technical skills exposure, lack of time to adapt, lack of content and a lack of time to reach competency level. Braun and Clarke's six-step thematic analysis was used for the qualitative data analysis, revealing two themes for RQ1 and four for RQ2. These included quality of IP, skills and knowledge acquisition for RQ1 and adapting to a new clinical environment, quality of IP, resource person during IP and challenges with skills and knowledge acquisition for RQ2.

The study's findings supported the need to acknowledge the impacts OR nursing IPs had on OR NJNs in Singapore. Based on the findings, it was recommended for Singapore OR units to review the contents and delivery of their OR nursing IPs. Additionally, the author recommended to make available a new graduate programme for speciality care areas in Singapore to establish nurses in those areas better and devise the roles of mentors and

preceptors to align learning needs of NJNs. The recommendation might require time to execute in the post-pandemic era. Nonetheless, it would be necessary to address it in the future and revitalise the healthcare workforce.

The author underwent many critical learnings during the process of undertaking the study. One main learning point included having issues with the initial data collection plans. This was overcome with the study's supervisor's proper guidance to establish multiple data collection scenarios. The author's perspectives regarding the study phenomenon have changed in his professional environment since undertaking the study. The clarity the study provided was beneficial in terms of how the author approaches new colleagues and a better understanding of the needs and wants of nurses of this generation at a doctorate level.

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APPENDICES

Appendix A – Project Management Chart

<u>Topic</u>	<u>Chart</u>			
The impacts of nursing induction programmes (IPs) on newly-joined nurses (NJNs) in Singapore operating rooms (ORs): A mixed-methods study		1 st Month	2 nd Month	3 rd Month
	Chapter 1	Submitted final research proposal to the Doctoral Programmes Coordinator.	Await ethical approval from UREC.	Submitted final revision of UREC form to UNICAF School of Doctoral Studies after approval from UREC.

<u>Research Objectives</u> The objectives of the study are: 1. Explore the challenges faced by Singapore OR nurses with the current OR nursing induction programmes. 2. Explore the effectiveness of current perioperative induction programmes for NJNs in Singapore OR units. 3. Understand the different group experiences of OR nurses who were given the structured induction programme versus the ones who did not. 4. Explore the potential benefits of having a structure perioperative nursing induction programme for		Put up research ethic application form and for supervisor to review and submit to UREC committee for approval.	Continue with literature review.	Planning of project management chart. Submitted project management chart online.
		Literature review.	Edit ethical approval form after discussion with supervisor for final revision.	Formulate research problem statement and purpose of study.
				Submitted of research problem statement and purpose of study.
				Continue with literature review.
				Formulate research aims and objectives.

enrolled and registered nurses.	Chapter 1	4 th Month	5 th Month	6 th Month
		Submitted research aims and objectives.	Continue with identifying nature and significance of study with more review of literature.	Complete write up of dissertation chapter 1 and submitted online.
		Formulate research questions and hypotheses.	Submitted nature and significance of study.	Submitted dissertation stage 1 report.
		Submitted research questions and hypotheses.	Continue with literature review.	Continue with literature review for chapter 2.
		Identify nature and significance of study.		
		Continue with literature review.		
<u>Supporting Theories</u> 1. Benner’s novice to expert theory, 2001. This is one of the early days nursing theories that helps explore	<u>Contribution of your research</u> This study's contribution is expected to aid hospitals in Singapore to sustain and retain nurses longer by reducing clinical stress and having more guided learning in specialised nursing fields by having structured programmes at the beginning of a nurse's journey to better prepare them in their new roles. Additionally, it will contribute to resolving new nurse recruits' challenges in Singapore OR			

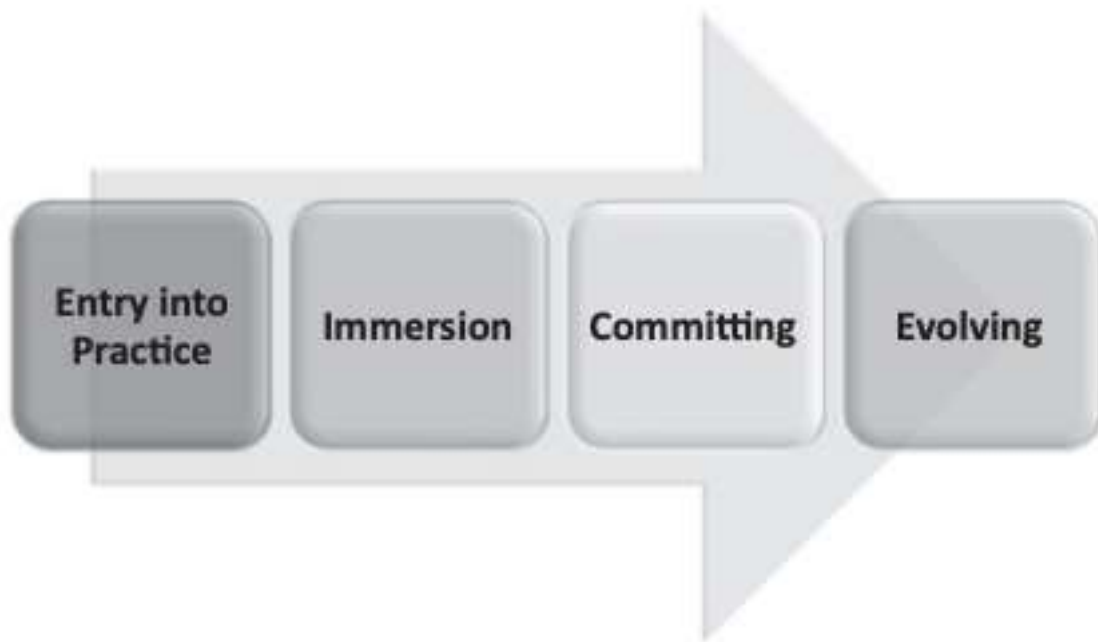
<p>the development of nurses with stages starting from student nursing or new graduate nurses to later becoming an expert nurse.</p> <p>2. Bridges's transition theory, 2009. This theory explores three stages of transition when a person enters a new environment and slowly transition to adapt to it. The three stages include letting go, neutral and new beginnings.</p> <p>3. Duchscher's stage of transition theory and transition shock model, 2008. This theory explores the process of change within a graduate's year. The 12-month time frame to</p>	<p>units by providing empirical evidence for the importance of having an OR unit-specific specialised nursing induction programme.</p> <p>Lastly, the study will contribute insights for nursing policymakers, administrators and educators to administer change to current policies on new OR nurse recruits' orientation and induction to the unit; and resolve past challenges OR nurses faced in their job roles due to elements</p>
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<p>understand the change process is measure with three steps; doing, being and knowing.</p> <p>4. Substantive theory of students' orientation to nursing by Vanhanen, Hentinen and Janhonen 1999. The theory explored three different orientations to nursing were found: a caring orientation, a nursing expertise orientation and a life orientation.</p> <p>5. Substantive theory of finding meaning to overcome hiding behind a mask by Smith, Wesley and Wynaden, 2015. The theory explores the meaning of OR nurses' challenges in assisting organ</p>	
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<p>procurement surgery. It explores and test two main themes: level of experience and knowledge.</p> <p>6. Role Theory by Ashley, Brown, Halcomb and Peters, 2018. The role theory has been used in past nursing research to explore nurses transition in workplace. This include role ambiguity and environment.</p> <p>7. Conceptual Model of Nursing Motivation by Warren and Mills, 2009. This motivational theory was developed to explore the motivating factors for nurses to return for an advance degree.</p>	
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Appendix B: List of Key Search Terms

Key Search Terms	
Adaptation in OR nursing	Nursing retention
Benner's novice to expert theory	Nursing retention in Singapore
Bullying in nursing	Nursing shortfall in OR units
Bullying among perioperative nurses	Nursing shortfall in Singapore
Burnout among OR nurses	Perioperative nursing challenges in Singapore
Challenges of perioperative nursing practice	Orientation programmes
Challenges of nurses in Covid-19 pandemic	Orientation programmes for perioperative nurses
Challenges in transition to practice of new nurses	OR nursing retention
Competence and confidence in OR nursing practice	Periop 101 nursing programme
Elective surgery during Covid-19 pandemic	Perioperative nurses role in robotic surgeries
Fiscal motivation in nursing	Perioperative nursing
Future of OR nursing	Perioperative nursing challenges
Global nursing shortfall	Perioperative nursing practice
Induction programmes for perioperative nurses	Perioperative nursing resilience
Induction programmes for new nurses	Resilience among nurses
Orientation programmes for new nurses	Theory-practice gap among novice nurses
Motivation among nurses	Theory-practice gap in nursing practice
Motivation among perioperative nurses	Technology in nursing
Nurses burnout	Transition to practice of new nurses
Nursing induction programmes	Warren and Mill's conceptual model of nursing motivation

Appendix C: Theory Becoming Alive

Source: Nour and Williams, 2019, p.9.

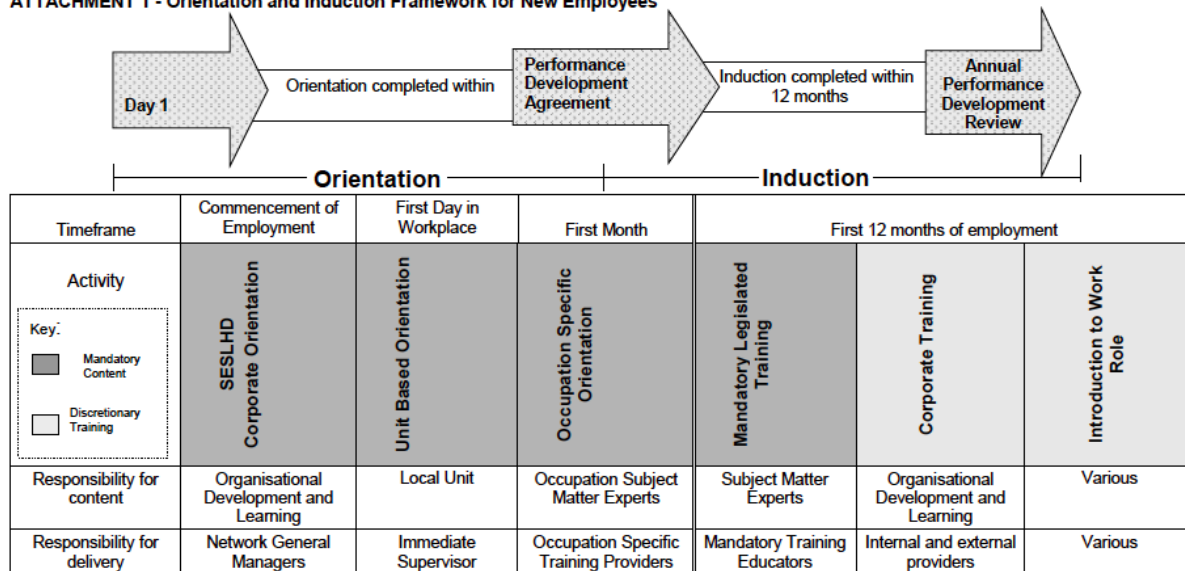
Appendix D: NSW Health Orientation and Induction for New Employees

POLICY DIRECTIVE

Orientation and Induction- New Employees

SESLHDPD/172

ATTACHMENT 1 - Orientation and Induction Framework for New Employees



REVISION 14

Date: May 2018

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Source: NSW Health, 2018, p.9.

Appendix E: Six Core Competencies to Measure OR Swedish Nurse Competent Level

TABLE 1 Description of healthcare providers' general core competencies

Person-centred care	Interdisciplinary teams	Evidence-based practice
To provide care that reflects the whole person. To identify, respect and care about patients' differences, preferences and expressed needs. To provide information and communicate with patients in a fully open manner, using a language that they understand, to enable them to make informed decisions about different aspects of care. To provide timely, tailored and expert management of symptoms, relieve fear and anxiety, and be able to anticipate patient needs through planning (IOM, 2003).	Composed of members from different professions with varied and specialized knowledge, skills and methods. An effective team has knowledge of each team member's expertise, knowledge and values. The team members integrate their expert knowledge and bodies of experience to coordinate, collaborate and communicate to optimize care. These teams need to deal with the increasing complexity of care and keep pace with the demands of new technology (IOM, 2003).	Decision-making should be based on the best available scientific and standardized knowledge, integrated with clinical expertise and patient values and preferences. Healthcare professionals need to know where and how to find the best possible sources of evidence, to evaluate the findings concerning validity and usefulness with a patient or population and determine how to integrate the findings into practice (IOM, 2003).
Quality improvements	Safe care	Informatics
To reduce inefficiency, waiting times and delays, and avoidable errors that could harm patients. This continuous work requires healthcare professionals to understand and measure the quality of care, to assess the current practices and identify opportunities for improvement. The need to formulate what they are trying to accomplish, what can result in an improvement and how the improvement can be detected and measured (IOM, 2003).	Implies having knowledge, skills and attitudes to minimize the risk of harming patients and care providers through system effectiveness, including systematic safety work and individual performance. Knowledge on causes of error, allocation of responsibility and accountability is needed, as well as skills using technology and standard practices that support safety and quality and having effective strategies to reduce risk of harming oneself or others (Cronenwett et al., 2007).	To search, retrieve, manage and make decisions using electronic data from internal and external databases, as well as to understand security protections and directly address ethical and legal issues. To enhance education and access to accurate and reliable information for patients, and act in compliance with regulatory requirements to guarantee the privacy and the confidentiality of patients (IOM, 2003). Basic competence on informatics is essential for developing the other five core competencies (Cronenwett et al., 2007).

Source: von Vogelsang et al., 2019, p.497

Appendix F: Periop 101 Fundamentals Course Modules

Sidebar 1. *Periop 101 Fundamentals* Course Modules¹

- Introduction to Perioperative Nursing
- The Surgical Environment
- Perianesthesia Nursing
- Perioperative Assessment
- Sterile Technique
- Safety in the Surgical Suite
- Scrubbing, Gowning, and Gloving
- Positioning the Surgical Patient
- Skin Preparation
- Sterilization and Disinfection

Editor's note: Periop 101 is a trademark of AORN, Inc, Denver, CO.

Reference

1. Periop 101 for Nursing School Programs. AORN. <https://www.aorn.org/education/facility-solutions/periop-101/periop-101-for-nursing-school-programs>. Accessed April 17, 2017.

Source: Tschirch et al., 2017, p.123.

Appendix G: Quantitative Instrument Tool

Research tool: Quantitative survey questionnaires – IORNTSP survey

Title: The Impacts of Nursing Induction Programmes (IPs) on Newly-Joined Nurses (NJNs) in Singapore Operating Rooms (ORs): Cohort Study

1. Please answer ALL questions and make sure you follow the instructions for each question.
2. The questionnaire should only take 15 minutes to complete and it includes 43 questions.

Your responses are confidential and will not be identified with you in any way.

3. If you choose to stop answering the questions because you feel uncomfortable to answer further, you may withdraw without any obligations.
4. You may be contacted for a follow-up interview via the email address that you provide for the researcher to gain more insight of the phenomenon of this study.
5. If you have any further enquiries, please contact the principal researcher at

kaiibrahimergo@gmail.com.

Personal Details

Please insert the email address that you wish to be contacted via if you would like to selected for a follow up study:

The first set of questions are related to your personal status and job role.

1. How old are you?
2. What is your gender?
 - a. Female
 - b. Male
 - c. Others
3. How long ago did you graduate from school?
 - a. Less than a year
 - b. Less than two years
 - c. Less than three years
 - d. More than three years
4. How long have you been in your OR unit?

5. How long have your organisation been in operation?

6. What is your highest nursing qualification?

- a. Nitec in Nursing
- b. Diploma in Nursing
- c. Bachelor Degree in Nursing
- d. Master Degree in Nursing or equivalent
- e. PhD in Nursing or equivalent

7. What is your current job title?

- a. Enrolled Nurse
- b. Registered Nurse

8. What is your job role in the OR unit?

- a. Admission Nurse
- b. Anaesthetic Nurse
- c. Post Anaesthesia Care Unit (PACU) Nurse
- d. Scrub and Scout Nurse

9. Please state in the box the batch that you joined your OR unit in format month/year.

Insert answer.....

Staff Unit Orientation

The next set of questions will be regarding your experiences of your unit orientation programme. * ***This include contents of general orientation of your ward surroundings, staff members and service functions.***

10. Did you received a unit orientation on commencement of joining the OR unit on the first day?

- a. Yes
- b. No

11. Who did the unit orientation with you?

- a. OR Nurse Manager
- b. Senior OR Nurse (Non-management)

- c. A nurse educator / clinical instructor
12. Were you personally introduced to your new colleagues in your OR unit?
- a. Yes
- b. No
13. How long was the orientation programme?
- a. One full shift (8 hours)
- b. Half a full shift (4 hours)
- c. Less than half a shift
- d. More than one full shift
- e. Not applicable

Staff Unit Orientation

The following questions will be answered based on your satisfactory level of your OR unit orientation. **If you did not receive your unit orientation please select "N.A."*

Question	Very Satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied	N.A.
14. How satisfied are you with the unit orientation you underwent?						
15. How satisfied are you with the facilitator of the unit orientation you underwent?						
16. How satisfied are you with the duration of the unit orientation you underwent?						
17. How satisfied are you with the coverage of your unit						

that was covered in your unit orientation you underwent?						
18. Overall, how satisfied are you with the delivery of the unit orientation you underwent?						

OR Unit Nursing Specific Specialisation Induction Programme

The next set of questionnaires are questions related to your specific job role induction that you have undergone. **Nursing specific specialisation refers to your permanent role that have been allocated to you by your unit management. These includes nursing roles such as Admission, Anaesthetic, Post Anaesthesia Care Unit (PACU), Scrub and Scout nurses.*

19. Did you received an OR unit nursing specific specialisation induction programme after the completion of your general OR unit and hospital-wide orientation?
 - a. Yes
 - b. No
20. Was the induction programme specific to your job role? If No, proceed to question 22. Otherwise please continue to question 21.
 - a. Yes
 - b. No
21. Was the induction programme conducted to cover all OR nursing roles to learn all areas of the OR unit?
 - a. Yes
 - b. No
22. How long was the duration of your OR unit nursing specific specialization induction programme?
 - a. Lesser than a week
 - b. 1 -2 week

- c. 3- 4 weeks
 - d. More than 4 weeks
23. Who facilitated the induction programme you underwent?
- a. Nurse educator specialised in OR unit
 - b. Specialised trained nurse in the OR unit (a nurse who possess an Advance Diploma in Perioperative or Peri-anaesthesia Nursing)
 - c. Senior nurse who has worked in the OR unit without any post-basic certificate in OR nursing.
 - d. Others.
24. Was the facilitator insightful with the topics that were covered in the induction programme?
- a. Yes
 - b. No
25. Were you assessed on your knowledge and skills that were required of your job role during the phase of the induction programme?
- a. Yes
 - b. No

OR Unit Nursing Specific Specialisation Induction Programme

The next set of questions will ask about how strongly you agree or disagree regarding the your OR unit nursing specific specialization induction programme. * Please select “N.A.” for questions that are not applicable.

Question	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	N.A.
26. My new job role in the OR was effectively explained during the induction programme.						

27. I faced challenges after undergoing my induction programme as I did not receive the necessary and sufficient technical skills required for my level for my new job role.						
28. I am identified as a member of the team I am allocated to after undergoing the induction programme.						
29. I faced challenges after undergoing the induction programme as I was unable to put theory into practice based on my level of OR nursing.						
30. I faced challenges after undergoing the induction						

programme as I was not given enough time to adapt to my new job role.						
31. My facilitator guided me well according to my level during the induction programme.						
32. I faced challenges after undergoing my induction programme as the topics covered during the induction programme were not sufficient to prepare me for my new job role at my level.						
33. I faced challenges in helping understand concepts and seeking clarification on the topics covered during						

the induction programme.						
34. I faced challenges in helping understand concepts and seeking clarification on the topics covered after undergoing the induction programme.						
35. I was given sufficient time, at my level, to reach the competency level for my new job role before I was confirmed.						
36. I faced challenges in reaching the competence level for my new job role based on my level during my probation period as I was not given sufficient						

resources in the induction programme						
37. I faced challenges with my confidence as I did not receive the skills and knowledge required for my level of OR nursing in the induction programme.						
38. Overall, the OR unit nursing specific specialization induction programme was helpful in preparing me for my competence with my OR job role.						
39. Overall, after undergoing the induction programme, I find the job role I was assigned fit to me.						

Overall experience of your induction programme

The next set of questions will ask about your overall experience regarding the OR unit nursing specific specialization induction programme.

40. Please state in the box what do you find most useful about the OR unit nursing specific specialization induction programme you underwent.

Insert answer.....

41. Please state in the box what do you find most not useful about the OR unit nursing specific specialisation induction programme you underwent.

Insert answer.....

42. Overall, how do you rate your OR unit nursing specific specialisation induction programme?

- a. Excellent
- b. Very Good
- c. Satisfactory
- d. Needs improvement (Please insert in the box below if you selected this option)

Please specify, what needs improvement?

Insert answer.....

43. I would recommend the OR unit nursing specific specialisation induction programme I underwent to future new staff?

- a. Yes
- b. No (Please fill in the box below in you click on this option)

Why would you not recommend the programme you underwent?

Insert answer.....

Thank you for your participation!

Appendix H: Qualitative Instrument Tool

Research Tool: Qualitative Questionnaires

Descriptive Data

19. What is your age?
20. What is your role in the OR unit?
21. What is your job title?
22. What is your highest nursing qualification?
23. What is your highest non-nursing qualification if you have one?
24. How long have you worked in the OR unit in your role?

Unit orientation

25. Did you receive a unit orientation during your first day of work to the OR unit? If no, why?
26. Which year and month, were, you orientated to you OR unit?
27. How was your unit orientation like?
28. Do you consider your unit orientation formal or informal? Why?
29. Were there any challenges faced during the unit orientation? Please explain.

OR unit nursing specific specialised induction programme

30. Did you, undergo any OR unit nursing specific specialised induction programme, different from that of the hospital wide newly-joint employee programme, to prepare you for your new job role after undergoing the OR unit orientation? If no, why?
31. Who facilitated your OR unit induction programme?
32. How do you find the facilitator(s) of your OR unit induction programme?
33. How long was your induction programme for?
34. What were the areas covered during the programme?
35. Was it sufficient to prepare you for your job role in the OR? Please elaborate.
36. Do you feel that the length of the programme was sufficient to prepare you for your new job role in the OR? Please elaborate.
37. Were there any challenges that you faced during the induction programme that later affected you in your job role?
 - a. Please explain if yes.
 - b. If no, how did it prepare you well for your job role?
38. Do you know if the programme you underwent was different from that of previous nurses in the unit? Please explain.
39. In your opinion, did you feel that the current induction programme you underwent was beneficial for preparedness of facing challenges as a newly-joint OR unit nurse? Please explain.
40. In your opinion, were there any gaps in the OR unit induction programme you underwent? Please explain.
41. What was the one thing you liked and dislike about the OR unit induction programme you underwent?
42. If there was one thing you could change about the current OR unit induction programme you underwent, what would it be?

Appendix I: Gatekeeper Letter



UU_GL - Version 2.0



Gatekeeper letter

Address: SingHealth OR units

Date:

Subject: Research study participant recruitment

Dear Nursing Management of SingHealth,

I am a doctoral student at Unicaf University Zambia.

As part of my degree I am carrying out a study on the impact on perioperative nurses with induction programme.

I am writing to inquire whether you would be interested in/willing to permit the recruitment of OR nurses in your institution for this research.

Subject to approval by Unicaf Research Ethics Committee (UREC) this study will be using online questionnaires and face-to-face interview to retrieve data from potential participants.

The purpose of carrying out the study is to explore the challenges that newly-join nurses in Singapore OR face in the job roles after undergoing their induction programme. The title of the study is 'Impact on Perioperative Nurses with Induction Programme: Cohort study'. I have the privilege of having Dr David Mulenga who have been supervising me in my PhD journey.

An email consisting the information about the study would be required to be sent to participants on my half. Also, data such as length of service of nurses are required to provide more accuracy in the trends of the phenomenon. The engagement time for the participants for this study will take a maximum of three months. This will include an initial online survey and followed by a follow-up survey that will recruit some participants for a one-to-one interview.

Thank you in advance for your time and for your consideration of this project. Kindly please let me know if you require any further information or need any further clarifications.

Yours Sincerely,

Muhammad Kai Ibrahim Ergo

Student's Name: Muhammad Kai Ibrahim Ergo Bin Mohamad Azmi

Student's E-mail: kaiibrahimergo@hotmail.com

Student's Address and Telephone: 45/507 Elizabeth Street, Surry Hills, NSW 2010, +61405395951

Supervisor's Title and Name: Dr David Mulenga

Supervisor's Position: Public Health Specialist

Supervisor's E-mail: d.mulenga@unicaf.org

Appendix J: Research Ethics Application Form (REAF) Approval from UREC



REAF_DS - Version 3.1AP


**UNICAF UNIVERSITY
RESEARCH ETHICS APPLICATION FORM
DOCTORAL STUDIES**

UREC USE ONLY:

Application No:

Date Received:

Student's Name: Muhammad Kai Ibrahim Ergo Bin Mohamad Az

Student's E-mail Address: talc_cussons@hotmail.com

Student's ID #: R1907D8925645

Supervisor's Name: Dr David Mulenga

University Campus: Unicaf University Zambia (UUZ) ▼

Program of Study: UUZ: PhD Doctorate of Philosophy ▼

Research Project Title: The Impacts of Nursing Induction Programmes (IPs) on Newly-Joined Nurses (NJNs) in Singapore Operating Rooms (ORs) : Cohort Study

1. Please state the timelines involved in the proposed research project:

Estimated Start Date: 14-Dec-2020

Estimated End Date: 31-Dec-2022

2. External Research Funding (if applicable):**2.a. Do you have any external funding for your research?**☐ YES☒ NO

If YES, please answer questions 2b and 2c.

2.b. List any external (third party) sources of funding you plan to utilise for your project. You need to include full details on the source of funds (e.g. state, private or individual sponsor), any prior / existing or future relationships between the funding body / sponsor and any of the principal investigator(s) or co-investigator(s) or student researcher(s), status and timeline of the application and any conditions attached.

2.c. If there are any perceived ethical issues or potential conflicts of interest arising from applying or and receiving external funding for the proposed research then these need to be fully disclosed below and also further elaborated on, in the relevant sections on ethical considerations later on in this form.

3. The research project

3.a. Project Summary:

In this section fully describe the purpose and underlying rationale for the proposed research project. Ensure that you pose the research questions to be examined, state the hypotheses, and discuss the expected results of your research and their potential.

It is important in your description to use plain language so it can be understood by all members of the UREC, especially those who are not necessarily experts in the particular discipline. To that effect ensure that you fully explain / define any technical terms or discipline-specific terminology (use the space provided in the box).

The purpose of this study is to add focus on the importance of perioperative nursing content in pre-enrolled and pre-registered programmes, in order to improve current operating room (OR) nursing induction programmes to better prepare newly-joined nurses (NJNs) for challenges in their new job role in the OR unit. Additionally, this research will help teaching institutions and hospitals to identify the missing elements in their current nursing curricula; and how it could be resolved through understanding the challenges and needs of OR nurses with the job roles.

The research questions are:

RQ1. To what extent does having an OR unit specific specialised nursing IP enhance OR unit nurses' knowledge and skills in performing their new job roles?

H10. Having an OR unit specific specialised nursing IPs will not result in the enhancement of OR NJNs in Singapore knowledge and skills in performing their new job roles.

H1a. Having an OR unit specific specialised nursing IPs will result in the enhancement of OR NJNs in Singapore knowledge and skills in performing their new job roles.

RQ2. To what extent do OR unit specific specialised nursing IP influence the challenges NJNs in Singapore OR faced with their ability to perform their roles?

H20. OR unit specific specialised nursing IPs has no effects on the challenges Singapore OR NJNs faced with their ability to perform their roles.

H2a. OR unit specific specialised nursing IPs has effects on the challenges Singapore OR NJNs faced with their ability to perform their roles.

This study expected outcome is to aid hospitals in Singapore to sustain and retain nurses longer by reducing clinical stress and having more guided learning in specialised nursing fields by having structured programmes at the beginning of a nurse's journey to better prepare them in their new roles. Additionally, possible results such as challenges faced by new nurse recruits in Singapore the OR unit will be known, and evidence for the importance of having an OR unit specific specialised nursing induction programme will be achieved.

3.b. Significance of the Proposed Research Study and Potential Benefits:

Outline the potential significance and/or benefits of the research (use the space provided in the box).

The potential significance is to find solutions for OR nurses in Singapore in challenges they face with current OR nursing induction programmes that later affects their job roles; and thus, leading many nurses to leave the nursing workforce due to the lack of support and proper training that they encounter when entering a specialized area such as the OR. Therefore, this study will be beneficial for nursing management and educators in the OR units as it will provide opportunities for them to understand how they can better follow support OR nurses from the beginning of their nursing career. Additionally, it will help nursing schools in Singapore to include more beneficial contents in their OR nursing modules to allow nursing students to improve their understanding of the roles of OR nurses and working environment. Lastly, acknowledging the challenges that Singapore OR nurses face in quest to better their job roles, will alleviate the nursing profession and lessen the gaps on issues leading to continuing poor staff turnover, support and education catered in the OR unit.

4. Project execution:

4.a. The following study is an:

- ☒ experimental study (primary research)
- ☐ desktop study (secondary research)
- ☐ desktop study using existing databases involving information of human/animal subjects
- ☐ Other

If you have chosen 'Other' please Explain:

4.b. Methods. The following study will involve the use of:

Method	Materials / Tools
Qualitative:	<input checked="" type="checkbox"/> Face to Face Interviews
	<input type="checkbox"/> Phone Interviews
	<input type="checkbox"/> Face to Face Focus Groups
	<input type="checkbox"/> Online Focus Groups
	<input type="checkbox"/> Other *
Quantitative:	<input type="checkbox"/> Face to Face Questionnaires
	<input checked="" type="checkbox"/> Online Questionnaires
	<input type="checkbox"/> Experiments
	<input type="checkbox"/> Tests
	<input type="checkbox"/> Other *

*If you have chosen 'Other' please Explain:

5. Participants:

5 a. Does the Project involve the recruitment and participation of additional persons other than the researcher(s) themselves?

- ☒ YES If YES, please complete all following sections.
- ☐ NO If NO, please directly proceed to Question [7](#).

5 b. Relevant Details of the Participants of the Proposed Research

State the number of participants you plan to recruit, and explain in the box below how the total number was calculated.

Number of participants

The sampling size is based on the formula $n = N / [1 + N (e)^2]$ by Taro Yamane (1967). Where; n = the sample size, N = the finite population, e = the level of significance or limit of tolerable error (0.05) & 1 = constant. The sample recruitment size is based on the approximate intake of NJNs into Singapore OR unit each year (80) for 2 years ($N=160$). 8 participants will later be recruited for the qualitative phase. (2 denotes square root).

Describe important characteristics such as: demographics (e.g. age, gender, location, affiliation, level of fitness, intellectual ability etc). It is also important that you specify any inclusion and exclusion criteria that will be applied (e.g. eligibility criteria for participants).

Age range From To

Gender ☒ Female
☒ Male

Eligibility Criteria:

- Inclusion criteria
- Exclusion criteria

Disabilities

Other relevant information (use the space provided in the box):

Due to COVID-19, the projected number of participants to be recruited may be affected due to decrease requirement for NJNs to the OR unit. The possibility of recruiting participants who have joined less than three years in the OR unit may be implied if desired number of participants for the quantitative phase could not be achieved. The breakdown of participant size are as follows: 114 quantitative phase and 8 qualitative phase.

5 c. Participation & Research setting:

Clearly describe which group of participants is completing/participating in the material(s)/ tool(s) described in 5b above (use the space provided in the box).

This study will involve newly join the OR unit in public hospitals in Singapore. It will involve nurses working in all OR unit areas, except the Theatre Sterile Supply Unit (TSSU). This will include the reception and admission area, anaesthetic, operating room and recovery room. The nurses working in these areas include Admission, Anaesthetic Nurse, Post-Anaesthesia Care (PACU) and Scrub and Scout nurses.

5 d. Recruitment Process for Human Research Participants:

Clearly describe how the potential participants will be identified, approached and recruited (use the space provided in the box).

The potential participants will be identified based on participant referral through snowball sampling. The author will approach former colleagues and seek their assistance to pass on the research participation recruitment poster that will include a URL link for potential participants who meets the inclusion criteria. Participants who meets the requirements of the inclusion criteria, a URL link will be available in the recruitment poster for them to understand more about the purpose of the research and how their participation to the study would contribute to the findings of the research topic through the event registration sheet and approach the author through email to find out more about the study. For participants who are agreeable to participate in the study, an informed consent and a participant information sheet will be forwarded to them through their email provided.

5 e. Research Participants Informed Consent.

Select below which categories of participants will participate in the study. Complete the relevant Informed Consent form and submit it along with the REAF form.

Yes	No	Categories of participants	Form to be completed
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Typically Developing population(s) above the maturity age *	Informed Consent Form
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Typically Developing population(s) under the maturity age *	Guardian Informed Consent Form

* Maturity age is defined by national regulations in laws of the country in which the research is being conducted.



5 f. Relationship between the principal investigator and participants.

Is there any relationship between the principal investigator (student), co-investigators(s), (supervisor) and participant(s)? For example, if you are conducting research in a school environment on students in your classroom (e.g. instructor-student).

☐

YES

☒

NO

If YES, specify (use the space provided in the box).

6. Potential Risks of the Proposed Research Study.

6 a. i. Are there any potential risks, psychological harm and/or ethical issues associated with the proposed research study, other than risks pertaining to everyday life events (such as the risk of an accident when travelling to a remote location for data collection)?

☐

YES

☒

NO

If YES, specify below and answer the question 6 a.ii.

6 a.ii Provide information on what measures will be taken in order to exclude or minimise risks described in 6.a.i.

6 b. Choose the appropriate option

	Yes	No
i. Will you obtain written informed consent form from all participants?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ii. Does the research involve as participants, people whose ability to give free and informed consent is in question?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iii. Does this research involve participants who are children under maturity age? If you answered YES to question iii, complete all following questions. If you answered NO to question iii, do not answer Questions iv, v, vi and proceed to Questions vii, viii, ix and x.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iv. Will the research tools be implemented in a professional educational setting in the presence of other adults (i.e. classroom in the presence of a teacher)?	<input type="checkbox"/>	<input type="checkbox"/>
v. Will informed consent be obtained from the legal guardians (i.e. parents) of children?	<input type="checkbox"/>	<input type="checkbox"/>
vi. Will verbal assent be obtained from children?	<input type="checkbox"/>	<input type="checkbox"/>
vii. Will all data be treated as confidential? If NO, explain why confidentiality of the collected data is not appropriate for this proposed research project, providing details of how all participants will be informed of the fact that any data which they will provide will not be confidential.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
viii. Will all participants /data collected be anonymous? If NO, explain why and describe the procedures to be used to ensure the anonymity of participants and/or confidentiality of the collected data both during the conduct of the research and in the subsequent release of its findings. Participants will not be anonymous as the qualitative aspect of this study requires to employ participants for a follow-up study. However, confidentiality and anonymity will be maintain during data presentation as no name, age or gender will be released on the paper.	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Yes	No
ix. Have you ensured that personal data and research data collected from participants will be securely stored for five years?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
x. Does this research involve the deception of participants? If YES, describe the nature and extent of the deception involved. Explain how and when the deception will be revealed, and who will administer this debrief to the participants:	<input type="checkbox"/>	<input checked="" type="checkbox"/>

6 c. i. Are there any other ethical issues associated with the proposed research study that are not already adequately covered in the preceding sections?

☐ Yes ☒ No

If YES, specify (maximum 150 words).

6.c.ii Provide information on what measures will be taken in order to exclude or minimise ethical issues described in 6.c.i.

6 d. Indicate the Risk Rating.

☐ High ☒ Low

7. Further Approvals

Are there any other approvals required (in addition to ethics clearance from UREC) in order to carry out the proposed research study?

☐ YES ☒ NO

If YES, specify (maximum 100 words).

8. Application Checklist

Mark ✓ if the study involves any of the following:

- ☐ Children and young people under 18 years of age, vulnerable population such as children with special educational needs (SEN), racial or ethnic minorities, socioeconomically disadvantaged, pregnant women, elderly, malnourished people, and ill people.
- ☐ Research that foresees risks and disadvantages that would affect any participant of the study such as anxiety, stress, pain or physical discomfort, harm risk (which is more than is expected from everyday life) or any other act that participants might believe is detrimental to their wellbeing and / or has the potential to / will infringe on their human rights / fundamental rights.
- ☐ Risk to the well-being and personal safety of the researcher.
- ☐ Administration of any substance (food / drink / chemicals / pharmaceuticals / supplements / chemical agent or vaccines or other substances (including vitamins or food substances) to human participants.
- ☐ Results that may have an adverse impact on the natural or built environment.

9. Further documents

Check that the following documents are attached to your application:

		ATTACHED	NOT APPLICABLE
1	Recruitment advertisement (if any)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Informed Consent Form / Guardian Informed Consent Form	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	Research Tool(s)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	Gatekeeper Letter	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5	Any other approvals required in order to carry out the proposed research study, e.g., institutional permission (e.g. school principal or company director) or approval from a local ethics or professional regulatory body.	<input type="checkbox"/>	<input checked="" type="checkbox"/>



10. Final Declaration by Applicants:

- (a) I declare that this application is submitted on the basis that the information it contains is confidential and will only be used by Unicaf University for the explicit purpose of ethical review and monitoring of the conduct of the research proposed project as described in the preceding pages.
- (b) I understand that this information will not be used for any other purpose without my prior consent, excluding use intended to satisfy reporting requirements to relevant regulatory bodies.
- (c) The information in this form, together with any accompanying information, is complete and correct to the best of my knowledge and belief and I take full responsibility for it.
- (d) I undertake to abide by the highest possible international ethical standards governing the Code of Practice for Research Involving Human Participants, as published by the UN WHO Research Ethics Review Committee (ERC) on <http://www.who.int/ethics/research/en/> and to which Unicaf University aspires to.
- (e) In addition to respect any and all relevant professional bodies' codes of conduct and/or ethical guidelines, where applicable, while in pursuit of this research project.



I agree with all points listed under Question 10

Student's Name: Muhammad Kai Ibrahim Ergo Bin Mohamad Az


Supervisor's Name: Dr David Mulenga

Date of Application: 06-Apr-2022

Important Note:

Save your completed form (we suggest you also print a copy for your records) and then submit it to your UU Dissertation/project supervisor (tutor). **In the case of student projects, the responsibility lies with the Faculty Dissertation/Project Supervisor.** If this is a student application, then it should be submitted via the relevant link in the VLE. Please submit only electronically filled in copies; **do not** hand fill and submit scanned paper copies of this application.

Appendix K: Online Participant Information Sheet



Participant Information Sheet

Research study participant registration form

Title: The Impacts of Nursing Induction Programmes (IPs) on Newly-Joined Nurses (NJs) in Singapore Operating Rooms (ORs): Cohort Study

Principal Investigator: Muhammad Kai Ibrahim Ergo Bin Mohamad Azmi (DBA candidate of Unicaf University).

Study Coordinator: Dr David Mulenga.

kaiibrahimergo@gmail.com [Switch account](#)

Not shared

* Indicates required question

- 1. What is the research study about?**

You are invited to participate in a survey of perioperative nurses in Singapore. The survey monitors the impacts perioperative nurses in Singapore have on nursing induction programmes. The results are used to guide hospitals to improve the impact of perioperative nursing in Singapore of this generation. Additionally, the study results will help nursing educators, management, and policymakers generate solutions to improve current induction programmes in Singapore OR units and improve those gaps. Finally, recognising these impacts that Singapore OR nurses face with their current induction programmes will also help the nursing profession close gaps on issues contributing to the ongoing poor staff retention rate in their OR units.
- 2. Who is conducting this research?**

The study is being carried out by a DBA candidate from UNICAF University. The research is supported by the appropriate personnel and ethic committees in Unicaf University Research Ethics Committee (UREC) and the study's supervisor Dr David Mulenga.
- 3. Inclusion/Exclusion Criteria**

Participation is open only to OR nurses registered under the Singapore Nursing Board as an RN or EN. They include Admission, Anaesthetic, PACU and Scrub and Scout nurses. They must not have worked in the theatre for more than two years and are English literate. Nurses in Theatre Sterile Supply Unit (TSSU) are not eligible to participate as they do not have a direct role in patient care, and all other nurses are not within the demographics of the inclusion criteria.
- 4. Anonymity and Consent**

This survey is completely anonymous. You are not required to provide your name or identity unless you choose to participate in Phase 2 of the study. To ensure your anonymity, consent forms are not being used for this phase of the study.
- 5. Do I have to participate in this research?**

Your participation in this study is voluntary, and you are under no obligation to participate. If, after reading this sheet and you decide not to move forward, you have the right to withdraw, and your withdrawal will be kept anonymous from the respective settings you were recruited. Likewise, if you decide to participate and later change your mind, you are free to withdraw from the study by discontinuing the survey, and your decision will be kept anonymous.

6. What does participation in this study require, and are there any risk involved?

The survey will take you approximately 15 minutes to complete. There are no possible risk or side effects to your health as there will be not any medications involved in the study. This study is purely based on a survey questionnaires and is anonymous, so do not write your name or identity unless you wish to participate in interviews to explore your perception regarding the topic of study during the second phase.

7. What are the possible benefits for participation?

There are no direct benefits for participants (such as remuneration). The study results may have indirect benefits by improving OR nursing practices of current generation nurses by restructuring contents of nursing induction programmes.

8. What will happen to information about me?

All questionnaires are kept for a minimum of period of 5 years of publication. All returned surveys are saved in password-protected files. Only accessible research team members may access these files. No identity about you is stored in the database, so you cannot be identified.

9. How and when will I find out what the results of the research study are?

Results of the study will presented in peer-reviewed journal and at national and international conferences upon completion.

10. What should I do if I have further questions about my involvement in the research study?

You may contact the principal investigator of the study:

Mr Muhammad Kai Ergo, Unicaf University Zambia,
kai@brahimergo@gmail.com.

If you are interested to be a part of this study, please fill in the information below and click on the link below to proceed with the survey.

Are you a recent joiner to the OR unit (<3years)? *

- ☐ Yes
☐ No

Are you working in Singapore? *

- ☐ Yes
☐ No

Survey Link.

<https://forms.gle/RvCqsyGarJ4TJ7SK6>

Submit

Clear form

Appendix I: Informed Consent



UU_IC - Version 2.1



Informed Consent Form

Part 1: Debriefing of Participants

Student's Name:	Muhammad Kai Ibrahim Ergo Bin Mohamad Az
Student's E-mail Address:	kaiibrahimergo@gmail.com
Student ID #:	R1907D8925645
Supervisor's Name:	Dr David Mulenga
University Campus:	Unicaf University Zambia (UUZ) ▼
Program of Study:	UUZ: PhD Doctorate of Philosophy
Research Project Title:	The Impacts of Nursing Induction Programmes (IPs) on Newly-Joined Nurses (NJs) in Singapore Operating Rooms (ORs) : Cohort Study
Date:	

Provide a short description (purpose, aim and significance) of the research project, and explain why and how you have chosen this person to participate in this research (maximum 150 words).

The purpose of this study is to explore the challenges that Singapore newly joint nurses in OR face with their current induction programmes to better prepare nurses in providing competent OR nursing care. The aim of this study is to provide insights into the effectiveness of current perioperative. This study results will help nursing educators, management, and policymakers generate solutions to improve current induction programmes in Singapore OR units and improve those gaps. Besides, recognising the impact that Singapore OR nurses face in their current induction programmes will help the nursing profession close gaps on issues contributing to the ongoing poor staff retention rate in their OR units. The group of people who are chosen to be part of this study have relevant insights into the phenomenon and will be able to provide the data required to answer the research questions.

The above named Student is committed in ensuring participant's voluntarily participation in the research project and guaranteeing there are no potential risks and/or harms to the participants.

Participants have the right to withdraw at any stage (prior or post the completion) of the research without any consequences and without providing any explanation. In these cases, data collected will be deleted.

All data and information collected will be coded and will not be accessible to anyone outside this research. Data described and included in dissemination activities will only refer to coded information ensuring beyond the bounds of possibility participant identification.

I, **Muhammad Kai Ibrahim Ergo Bin Mohamad Az**, ensure that all information stated above is true and that all conditions have been met.

Student's Signature: _____



Informed Consent Form

Part 2: Certificate of Consent

This section is mandatory and should to be signed by the participant(s)

Student's Name:	Muhammad Kai Ibrahim Ergo Bin Mohamad Az
Student's E-mail Address:	kaiibrahimergo@gmail.com
Student ID #:	R1907D8925645
Supervisor's Name:	Dr David Mulenga
University Campus:	Unicaf University Zambia (UUZ) ▼
Program of Study:	UUZ: PhD Doctorate of Philosophy
Research Project Title:	The Impacts of Nursing Induction Programmes (IPs) on Newly-Joined Nurses (NJNs) in Singapore Operating Rooms (ORs) : Cohort Study

I have read the foregoing information about this study, or it has been read to me. I have had the opportunity to ask questions and discuss about it. I have received satisfactory answers to all my questions and I have received enough information about this study. I understand that I am free to withdraw from this study at any time without giving a reason for withdrawing and without negative consequences. I consent to the use of multimedia (e.g. audio recordings, video recordings) for the purposes of my participation to this study. I understand that my data will remain anonymous and confidential, unless stated otherwise. I consent voluntarily to be a participant in this study.

Participant's Print name:

Participant's Signature:

Date:

If the Participant is illiterate:

I have witnessed the accurate reading of the consent form to the potential participant, and the individual has had an opportunity to ask questions. I confirm that the aforementioned individual has given consent freely.

Witness's Print name:

Witness's Signature:

Date:

Appendix M: Response codes, subthemes and themes for RQ1 and RQ 2

RQ1 Theme 1

Themes	Subthemes	Response codes
Quality of IP	Availability of IP	Yes No Yeah Ya I did recieve Yes I did I was trained under the anaesthetic unit specification training
	Delivery of IP	I consider it formal Informal for what I say It was rather formal It's formal Formal I would say I consider it formal Formal Was a formal It was quite formal Quite well They took the time They introduce to use the different set They showed Quite thorough They break it down They really Exposed me with ortho team. First few days she taught me Watch over me Drill into us Drilled into me It wasn't really touched on but it was just briefly said
	Length of IP	6 months training Maybe 2 weeks About 1 week or so Around 2-3 weeks This last a week. A week. I month approximately I think it only lasted a week 3 months. 1 to 2 to 3 days that became 2-3 weeks

Cont. RQ1 Theme 1

Themes	Subthemes	Response codes
Quality of IP	Content of IP	<p>The workflow</p> <p>Scope of practice</p> <p>Reception</p> <p>Theatre</p> <p>Scrub</p> <p>The totality of the organisation</p> <p>Layout</p> <p>The flow</p> <p>Informative</p>
	Satisfaction of IP	<p>Sufficient to a certain extend</p> <p>Sufficient for me to function daily</p> <p>Is sufficient because I have experience</p> <p>But if you are newbie...is not sufficient</p> <p>Sufficient but I still need to read up</p> <p>In a way</p> <p>It didn't really have an impact</p> <p>It helps me somehow</p>
	Comparing IPs	<p>I think they didn't had any programme at all</p> <p>Compared to my previous workplace where it was more tedious where I had to completed a lot of programmes</p> <p>Some are almost the same</p> <p>Because ahh other nurses learning is more on the ward base where as mine is in the operating room, operating theatre based</p> <p>It was more formal</p> <p>I think it's different because the programme here is more complex and much more detailed I should say</p>

RQ1 Theme 2

Themes	Subthemes	Response codes
Skills and knowledge acquisition	Tools to attain skills and knowledge	<p>They introduce to us the different sets that we have</p> <p>The names of the instruments</p> <p>Also instruments layout</p> <p>A checklist that they gave us that we had to complete</p> <p>They paired me and exposed me with ortho team</p> <p>Anaesthetic unit</p> <p>specification training</p> <p>Just hands-on immediately because knowing the background</p> <p>Drill into us during the orientation</p> <p>They gave us a booklet full of list that I am required to sign</p> <p>I just do it</p> <p>They emphasise on the policies and procedures that was important</p>
	Learning exposure	<p>It was sufficient for a beginner to start with</p> <p>But if you are a newbie, a week of orientation just just on your own is not sufficient</p> <p>Because I have experience</p> <p>You learn on the ground itself</p> <p>You really have to learn on the ground</p> <p>I have been in the theatre for many years</p> <p>It takes some time to know the instrument</p> <p>It wasn't really touched on but just briefly</p> <p>A skill that later on I I heard about that I needed to get use to</p> <p>It was drill into us during the orientation</p>

Cont. RQ1 Theme 2

Themes	Subthemes	Response codes
Skills and knowledge acquisition	Learning exposure	<p>I don't do it during the orientation itself</p> <p>There is not any other way</p> <p>It doesn't matter as long as it retains in your mind</p> <p>You just have to do it</p> <p>I think the pointers that help like learning</p> <p>The tips and tricks</p> <p>They really take the time to explain to us and introduce us</p> <p>They give information as much as they could</p> <p>They really thought me so they taught me specifically</p> <p>Practicing with you colleagues and your CI</p>
	Learning initiative	<p>Most of the things I learn on the job itself</p> <p>I still need to read up more on</p> <p>You learn on the ground itself</p> <p>Like learning how to identify the instruments that one you really have to learn on the ground</p> <p>I will try to communicate</p> <p>So normally I read up first</p> <p>I will try to communicate</p> <p>What to look out for</p> <p>They had to tag us</p> <p>I am a person who have to be on ground</p> <p>Because they give me the most important part skill that later on I I heard about that I needed to like get use to</p> <p>You have to learn it by yourself</p> <p>I can compare</p> <p>I can relate to my past experience</p>

RQ2 Theme 1

Themes	Subthemes	Response codes
Adapting to a new clinical environment	Immersing to a new work environment	<p>It takes/took sometime We didn't know It's quite a limitation to go through during orientation Running for instruments Where are we kept Where they stuff were kept Need to get use Preference Drilled into The formality to call What to look out for Ask The set-ups between Philippines and Singapore are...are they are so huge difference</p>
	Tools to help function in a new clinical environment	<p>The pointers that help Tips and tricks Helps us They had to tag us in someone ah and rotate us ahh in each areas lah with a preceptor Workflow wise they briefed us on ahh how to function in each area We can refer I have experience in different theatres I can compare It will help me visualise I have already been in the theatre environment for 11 years</p>

Cont. RQ2 Theme 1

Themes	Subthemes	Response codes
Adapting to a new clinical environment	Resilience	<p>I just do it</p> <p>Because there is not any other way</p> <p>So whether you are prepared or not you just have to do it</p> <p>In my opinion you can give as much as you want in an orientation but at the end of the day you still have to ask your colleagues and learn on the job</p> <p>Most of it ahh you have to learn it by yourself lah</p> <p>But I think umm...scrub nurses you learn on the ground itself.</p> <p>I actually learn the hard way</p>

RQ2 Theme 2

Themes	Subthemes	Response codes
Quality of IP	Satisfaction of IP delivery content	<p>I think the pointers that help</p> <p>What to look out for</p> <p>It really did helps us in a lot</p> <p>It really helps us in a lot</p> <p>For basic cases I feel it was enough</p> <p>It was very helpful for me</p> <p>I think it actually depends</p> <p>I mean it is good but that is not where you learn straight away</p> <p>I cannot say it totally yes</p> <p>I think it was sufficient enough</p> <p>They need to have specific</p> <p>It really did help us a lot</p> <p>My concern is</p> <p>So I think that's quite fine</p> <p>To me it is fine</p> <p>I think it was good for a beginner</p> <p>Not really</p> <p>Room for improvements</p>

Cont. RQ2 Theme 2

Themes	Subthemes	Response codes
Quality of IP	Satisfaction of IP delivery content	<p>I think the pointers that help What to look out for It really did helps us in a lot It really helps us in a lot For basic cases I feel it was enough It was very helpful for me I think it actually depends I mean it is good but that is not where you learn straight away I cannot say it totally yes I think it was sufficient enough They need to have specific It really did help us a lot My concern is So I think that's quite fine To me it is fine I think it was good for a beginner Not really Room for improvements</p>
	Outcome of IP in work preparedness	<p>They gave me like the most important part It will help me visualize Quite overwhelming especially if we don't know which discipline we are going It prepare us for...our main job You don't really have the kindna of real feeling The quick turn over they are expecting you to know everything after that period that you can do it on your own.</p>

Cont. RQ2 Theme 2

Themes	Subthemes	Response codes
Quality of IP	Ability to grasp learning	<p>At least we can refer</p> <p>The good important thing because the emphasis on</p> <p>The quick turn over they are expecting you to know everything</p> <p>Like when we learn everything usually quite overwhelming when urmm somethings that we learn is not applicable to us</p> <p>They gave us as much information as they could</p> <p>They taught me specifically</p> <p>You don't really have the kindna of real feeling</p> <p>I felt after like a few hours my attention span started to drop</p> <p>They don't have that much practical skills in giving care</p> <p>The time you were given to prepare and the real time was actually quite short</p> <p>We were just sitting there</p> <p>The down side is you cannot absorb everything</p> <p>Too much information</p>

RQ2 Theme 3

Themes	Subthemes	Response codes
Resource person during IP	Quality of the resource person	<p>They are quite well verse in their area</p> <p>They took the time to answer our questions</p> <p>They really went down to each and every bit</p> <p>They break it down in such a way</p> <p>They I find it very informative</p> <p>They really do share their experiences</p> <p>Very informative and helpful</p> <p>For the first few day she teach me</p> <p>She will let me go solo</p> <p>She will be in the induction room to watch over me</p> <p>Very knowledgeable</p> <p>They were very specific on your job description</p> <p>Friendlier</p> <p>It was not too bad it was fine</p> <p>She is informative</p> <p>She is kind</p> <p>She is warmth</p>
	Availability of resource person	<p>The seniors do not know what to teach us</p> <p>They were clinical instructors</p> <p>My clinical instructor</p> <p>Everyone was just so busy</p> <p>So we were like not really umm accommodated</p> <p>Was facilitated by my clinical nurse manager</p> <p>Nurse educator in our unit</p> <p>Nurse educator</p> <p>It is done by one of the CI</p> <p>The clinical educator that time she had handed over me to the senior orthopaedics scrub scout team</p>

RQ2 Theme 4

Themes	Subthemes	Response codes
Challenges with skills and knowledge acquisition	Information overloading	<p>It will help me to just visualise what will be the situation but will not prepare me to the job</p> <p>We are taking in as much information as we can</p> <p>That's only so much you can take</p> <p>We were just sitting there and we're trying to absorb all the information the educator is telling to us.</p> <p>We're trying to absorb all the information the educator is telling to us</p> <p>Because I mean if you are not so familiar to a place and not familiar to everything that is spoken to you. There is not many much retention.</p> <p>It was quite a struggle....for me when I started out</p> <p>It was quite a challenge because it took some time for us to know</p> <p>Too much information</p> <p>Quite overwhelming especially if we don't know which discipline we are going to</p> <p>You cannot absorb everything</p> <p>I felt like a few hours my attention span started to drop</p> <p>Was a bit too much information at that point of time</p> <p>Not many much retention</p> <p>Sometimes I will just remember it when I am already at it</p>

Cont. RQ2 Theme 4

Themes	Subthemes	Response codes
Challenges with skills and knowledge acquisition	Classroom versus reality	<p>We are only thought on the basic instruments and not more like the...the discipline specific ones. So...it takes some time to know the instruments and the instruments name and know where they are kept at.</p> <p>For me when I started out in the operating theatre because I didn't know how to achieve to position the patient</p> <p>Most of the information do not retain so you will ask again</p> <p>You won't learn everything</p> <p>Most of the things you won't even know or remember or even retain</p> <p>I actually learn the hard way</p> <p>I don't do it during the orientation itself</p> <p>Like a new grad. I think they need to have more training I guess because it is different for them when they actually on the field</p> <p>I think if you said it help you prepare, I don't think so because it will develop in yourself eventually. Because you cannot say you are prepared unless you are there in that situation.</p>

Cont. RQ2 Theme 4

Themes	Subthemes	Response codes
Challenges with skills and knowledge acquisition	Accessibility to OR nursing skills and knowledge	<p>Obviously we are at the advantage because we are actually getting expose to all this that our seniors didn't get exposed to</p> <p>Maybe umm provide more interaction, provide more umm ya I think more like interactive</p> <p>Maybe include a practical session where ah was more like umm participant based where they could get the crowd to actually like repeat The time frame and the scopes of what to be focus on the orientation programme</p> <p>Maybe more hands on ah because the one I attended is more a lot of theory so A bit more hands on is better Because you cannot say you are prepared unless you are there in that situation. based on my training that I had in my previous workplace I had a preceptor to guide me, encourage me and help me improve my skills as compared to what I have recently gone through where we have a new grad where they just throw them on the field and let them learn from their own mistakes</p> <p>I find it in my current workplace orientation is not really systematic</p>