Exploring Registered Nurse Perceptions of Single Patient Rooms after Transition from Multiple Patient Rooms

by

Teaghan Evans

B.S.N., QUEENS UNIVERSITY, 2015

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF

THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF SCIENCE IN NURSING

in

THE FACULTY OF GRADUATE AND POSTDOCTORAL STUDIES

(Nursing)

THE UNIVERSITY OF BRITISH COLUMBIA

(Vancouver)

March 2020

The following individuals certify that they have read, and recommend to the Faculty of Graduate and Postdoctoral Studies for acceptance, a thesis/dissertation entitled:

Exploring Registered Nurse Perceptions of Single Patient Rooms after Transition from Multiple Patient Rooms

submitted by Teaghan Evans in partial fulfillment of the requirements for

the degree of Master of Science in Nursing

in Faculty of Graduate and Postdoctoral Studies

Examining Committee:

Maura MacPhee
Supervisor

Elisabeth Bailey
Supervisory Committee Member

Tarnia Taverner
Supervisory Committee Member

Additional Examiner

Abstract

In October of 2017, British Columbia's Children's Hospital (BCCH) moved to an entirely new hospital with a completely new geographical unit layout consisting of 100% single patient rooms (SPR). Unit layout was based on SPR recommendations by the Facility Guidelines Institute (FGI), an international non-profit organization that establishes recommendations for the design of health-care facilities (FGI, 2006). The research on SPRs has focused predominantly on patients' reactions to this type of geographical layout. The literature states that patients have positive reactions to SPRs, but providers have concerns, particularly nurses' physical isolation, communications disruptions and patient visibility and monitoring. There are few publications on safety adaptations with respect to providers' SPR concerns.

At this hospital, nurses' reactions to the changeover to SPRs has not been formally evaluated. Anecdotally, direct care nurses have voiced concerns to their managers and directions. The purpose of this qualitative study was to explore nurse's experience and perception of the influences of SPR on their work. Utilizing qualitative descriptive methodology, seven registered nurses were interviewed in an attempt to understand the experience of transitioning from MPR to SPR.

As healthcare transitions to a patient and family-centered model of care, SPRs will become the standard of care. Prioritizing staff experience as much as patient experience is critical to maintaining morale and retention. Findings from this qualitative study enhance the literature evidence and provide nurse's recommendations for optimized use of SPRs.

Lay Summary

The goal of our research was to understand the experience of the direct care RNs at BCCH after transitioning to a single patient room unit layout. Previous research indicated a positive response from patients however, there was minimal understanding from a provider perspective. We interviewed seven RNs and found structural, process and relational changes associated with the transition from multi-patient rooms to single patient rooms.

Preface

Under the guidance of my supervisor: Dr. Maura MacPhee and in collaboration with committee members Elisabeth Bailey and Tarnia Taverner, I completed all aspects of this research. The study received ethics approval from the UBC Research Ethics Board. Certificate number: H9-00774.

Table of Contents

List of Tables

List of Abbreviations

ACU	Anesthesia Care Unit
CINAHL	Cumulative Index to Nursing and Allied Health Literature
EBD	Evidence Based Design
HCP	Health Care Provider
MPR	Multi Patient Room
NICU	Neonatal Intensive Care Unit
RN	Registered Nurse
SPR	Single Patient Room
UBC	University of British Columbia

Acknowledgements

I offer my enduring gratitude to the University of British Columbia and the UBC School of Nursing. The support and respect I received from every faculty and staff member provided the space and opportunity for my growth and success within this program. This project would not be possible without the support of my supervisor Maura MacPhee, thank you for your guidance throughout the entire project. Your leadership, dedication to students and passion for nurse's well-being is truly extraordinary. Thank you to my committee members, Elisabeth Bailey and Tarnia Taverner. Tarnia, thank you for the opportunity to conduct this research. Elisabeth, thank you for your continuous support and encouragement.

To the participants of the study, thank you for sharing your time, insights and narrative with me.

I need to acknowledge the endless support from Jennie McNichols, Matt Traher and Erin Devlin, who painstakingly proofread every abstract, chapter and paper as well as provided much needed emotional support throughout my entire graduate school journey – thank you for being there when I needed you most.

Finally, I have to thank my family, Elizabeth, Ron and Jack. Thank you, dad, for your endless encouragement and belief in me. Thank you, mom, for always answering the phone, for understanding and for supporting me throughout every aspect of my life. Thank you to my not so little brother, Jack, you are the comedic relief every grad student needs – I can't wait to see you succeed.

Thank you all from the bottom of my heart, I would not be here if it wasn't for all of your support.

Dedication

Dedicated to my parents. Mom, your resilience is unparalleled and your love is unconditional.

To my dad, Ron, you may not have given me life, but you sure have made my life better.

Chapter 1: Introduction

This chapter describes the background of single patient rooms and why they are the current design of choice for newly constructed or renovated units/hospitals. Additionally, my personal context is explored, and finally, the purpose and research questions are identified.

1.1 Background

Healthcare design impacts all members of the healthcare team, including patients, family and staff and taking all perspectives into account is critical to a thoughtful construction or reconstruction (Krupic et al., 2016). As healthcare shifts towards a patient and family centered model of care, single patient rooms (SPR) have risen as the clear design choice to create the ideal healing space for patients and families (FGI, 2006).

Healthcare design research has increased in the last 20 years as focus shifted from a biomedical to a holistic view of the patient. Understanding that the physical environment influences patient outcomes, medically, psychologically and socially is imperative to this growing body of evidence (Mroczek, 2006). Patient outcomes have been significantly impacted by the introduction of SPR. Ulrich et al. (2004) indicated in their review of the literature that SPR's reduced hospital acquired infections, medical errors, patient falls and patient stress, while improving privacy, social opportunities with family and patient satisfaction. Despite this overwhelmingly positive report, Taylor et al. (2018) also indicated an increased sense of isolation as well as a diminished connection to staff in relation to SPRs from the patient perspective. This unsurprising outcome is a natural response to decreased social interactions with fellow patients that would be more readily available in a multi-bed patient room. The creation of a healing space extends beyond simply being the only patient in the room – thoughtfully placed

green space, reduction in noise as well as a reduction in negative distractions such as others in pain or distress are also cited as major indicators for positive patient outcomes.

In 2006, The Facility Guidelines Institute, a non-profit guideline production organization, officially recommended SPR as the design of choice for all new hospital and unit construction or renovation. Despite this recommendation and the marked increase in SPRs across the world, a key stakeholder's perspective remains a gap in the literature – nurses.

Due to the FGI recommendations and overwhelmingly positive patient outcomes, SPRs are likely to become the standard of care within construction and renovation of new hospitals and units. Utilizing Evidence Based Design (EBD) to create the most psycho-socially and medically healing spaces is integral to the success of the multitude of new hospitals being built across the world as the population rapidly increases. In order to effectively use EBD, there must be an increase in the body of evidence surrounding effects and experience of all key stakeholders, with conscious attention to nurses.

Understanding the experience of nurses working in SPR is critical to understanding the facilitators and barriers to effectively transitioning to SPR. The change creates a significant practice change for nurses and challenges are inevitable as nurses are forced to adapt their workflows to counteract the layout changes. As hospitals around the world are redeveloped, integrating all stakeholders into qualitative research, such as interview and focus groups, will aid significantly in the knowledge translation necessary for protocol implementation and hospital design development, easing the transition for future sites and allowing for solution development for identified concerns.

1.2 Personal and Professional Context

In October of 2017, A major children's hospital in British Columbia Canada transitioned to a new building that consisted of 100% SPR. The experience of Registered Nurses (RNs) during this transition has not been formally evaluated despite significant anecdotal evidence regarding the concerns and challenges experienced by staff across the campus.

I was motivated to construct a qualitative study to understand and explore the experiences of nurses working through a transition to SPR themselves as I personally experienced the transition an RN in a Neonatal Intensive Care Unit. My personal experience strengthened my understanding of this concept and provided context to the qualitative data received. In my own experience, I noted challenges regarding isolation, visibility and social interactions after we transitioned to SPR.

I often found myself in either one of two situations. I was either with a very acute patient, in the room alone for extended amounts of time or I was alone at the desk, with minimal social interaction. The former situation presents communication concerns, Who can I call? Is anyone around? These questions run through your head while you are attempting to care for patients. There was the introduction of Voicera, which is essentially advanced walkie-talkie technology. The technology relies on knowing the full name or specific profession which presents a challenge in many situations, in particular, in emergency situations. The latter situation simply presents wellness concerns. Being alone for 12 hours takes a toll on your emotional and mental health – a change from being surrounded by co-workers in the multi-patient room prior to the move.

This being said, I also felt my time with patients and families was maximized in the sense of time and quality. This context is provided to illustrate my motivation to complete the study while also illustrating some of the reflexive work completed prior, during and after the study concluded.

1.3 Purpose

The purpose of this study was to explore the experience of registered nurses after transition from a multi-patient room (MPR) pediatric unit to 100% SPR. Literature indicates that healthcare providers have concerns about SPRs. Although there are ways to remedy these concerns, there is less known about healthcare providers' adaptation to changes in geographic layouts, specifically SPRs.

1.4 Research Question

What is the experience of RNs after transition from an MPR layout to 100% SPR in one pediatric unit?

1.5 Chapter Summary

This chapter provides a brief introduction to the research study. Focusing on background and significance of exploring the experience of RNs after transitioning to 100% SPR unit. The next chapter will provide a review of the current literature and identify of this study will address gaps in the literature about the healthcare provider perspective after transition to SPR.

Chapter 2: Literature Review

2.1 Introduction

As healthcare shifts towards patient centered models of care, hospitals have begun to transition their units from multi-patient rooms (MPR) to single patient room (SPR) (Kudchadkar et al., 2017 & Taylor et al., 2018). SPR have risen in popularity in the last 25 years in an attempt to improve patient satisfaction and support infection control. Patients and families generally prefer SPR as it provides privacy, light and sound control, all of which tend to a healing environment. Despite this positive response from patients, the response from healthcare providers depicts a different picture. There is significantly less research conducted on the RNs response to SPR, but what is available is inconsistent with diverse perspectives. Furthermore, the current literature is often quantitative with varied reliability.

This chapter summarizes the literature available on healthcare provider perspective on SPR. The majority of the research is conducted in neonatal intensive care units (NICU) as there has been a major push for family integrated care in NICUs however, as noted above, all aspects of inpatient clinical units have begun to shift towards a patient centered care paradigm. This indicates a gap in knowledge in not only RN experience in SPR but, RN experience in units other than NICU.

2.2 Search Strategy

An electronic search was performed in CINAHL (1982-2020) to identify relevant literature. The final search was run on January 31, 2020. The search is described as (MH "Patient rooms") OR (MH "Rooming In") OR TI (Patient room* OR single occupancy room or single family room OR SPR OR SFR or "rooming in") OR AB ("patient room" OR "single

occupancy room* OR “single family room* OR SPR OR SFR OR “Rooming in”) OR (MH Hospital Design and Construction”) OR TI (“unit design” OR “open bay ward” OR “hospital design” OR AB (“unit design” OR “open bay” OR “Hospital design”) AND (MH “Job Experience”) OR TI ((nurs* or staff) N3 (attitude* or perce* or experience*)) OR AB ((nurse* OR staff) N3 (attitude* OR Perce* OR expeerienc*)) OR (MH work environment+”) OR (MH” Nurse Attitudes). The search was then restricted to English which yielded 297 results. The search was then restricted to 2006 and beyond which yield 256. In 2006, the Facility Guidelines Institute reported that SPR be the design of choice as often as possible to support patient/family centered care, therefore, we felt this was a pivotal moment in SPR development and the search restriction was warranted (FGI, 2006).

After an overview of the search, 66 articles were reviewed. The other 190 did not adequately answer the research question, often referring to postpartum care, exclusively researching patient perspective or referring to nurse experience in any nursing unit. After a deeper review of the articles, 12 articles that aligned closest to our research question and problem were included in this literature review.

2.3 Teamwork

Does SPR foster or hinder teamwork? According to the literature, although SPR was previously perceived to have hindered teamwork, recent studies indicate teamwork is actually improved after a transition to SPR (Bosch et al., 2012; Winner-Sholtz et al., 2018; Watson et al., 2014). The literature supports that a move to SPR relies heavily on integrating new technology for advanced monitoring, communication and supporting teamwork, therefore, the improved perception of teamwork could be attributed to a workforce more comfortable with advanced technology.

Bosch et al. (2012) conducted a pre-post study to evaluate a NICU transition to SPR. The researchers identified that although nurses indicated they feared a loss of teamwork prior to the move, they found their fears unsubstantiated. Winner-Sholtz et al. (2018) indicated that their nurse participants perceived SPR to improve their teamwork in comparison to their open bay unit. Watson et al. (2014) also supported this claim, finding that their nurse participants noted significantly improved teamwork. The researchers proposed that this was because of proactive workflow initiatives such as increased opportunities for healthcare team check-ins and the implementation of walkie-talkie like devices to improve communication.

On the opposite side of the spectrum, Maben et al., (2016) indicated significantly impacted teamwork in their study of an entire hospital transition to SPR. Nurses in this study found it challenging to locate colleagues and indicated their new de-centralized (small teams of 8-10 nurses rather than the entire team of nurses) model of care decreased their social interaction, therefore impacting their ability to work as a team (Maben et al., 2016). Additionally, the nurses were concerned regarding the onboarding of new staff, indicating monitoring and formal and informal training were difficult to support due to the decreased awareness of learning opportunities (Maben et al., 2016). It should be noted that Maben et al. (2016) study was the most rigorous study reviewed, combining interview data, 369 hours of observation, surveys and pedometer data at two data points, pre and post move.

2.4 Isolation

As noted by Stevens et al. (2010), "social isolation in the workplace has a strong correlation with stress" (p. 256). Considering the high stress that comes with working in a hospital at baseline, the addition of social isolation and physical isolation due to geographical layout is especially concerning. Maben et al. (2016) found that social isolation was a significant

concern for not only the nurses but the patients as well. Doede et al. (2017) found that despite increased interactions with co-workers, nurses perceived lower quality of social interaction.

2.5 Communication

Nurses indicated that they perceived communication with other healthcare practitioners to be significantly impacted after the transition to SPR (Stevens et al., 2010; Walsh et al, 2006). A breakdown in communication creates a patient safety concern especially in combination with the other SPR factors noted in the literature, for example, severely impacted visibility of patients and fellow staff. Interesting, Maben et al. (2016) indicated that at the time of their data collection (one-year post move), the majority of their communication concerns were unresolved despite new workflows and new technology implementation. Swanson et al. (2013) found that although the communication scores were not impacted, they remained lower than the other practitioner (Physician and NP) and parents scores. Swanson et al. (2013) attributed this to feeling more isolated and increased dependence on technology. Another study by Domanico et al (2010) supported this finding of significant decreased perception of communication at both of their data collection points, immediately and 18 months post-move. Their study results were the most negative out of all the MPR to SPR transition studies. In their research, nurses preferred the MPR/ open bay design in five out of seven topic categories including communication and work environment (e.g., workload management, stress and teamwork).

2.6 Safety

In addition to contributing to higher stress, perceived decreased communication and increased isolation led to physical safety concerns in SPR. Winner-Stoltz et al. (2018) indicated nurses felt safer in open bay units compared to SPR. Considering the current call to action regarding workplace violence this should be a major indicator for policy development prior to

transition to SPR to ensure the safety of the staff and patients. Winner-Stoltz et al. (2018) again provided insight into their site's solutions: Their organization addressed the safety concerns with increased rounding by security and house staff; the organization replaced opaque patient room doors with glass to improve visibility; and close circuit video monitoring was installed to improve safety perceptions on the unit.

Stevens et al. (2010) indicated that although their communication and visibility with/of co-workers was impacted, their participants did not feel unsafe in their new environment. This aligns with a second study by Stevens et al. (2012) that indicated the quality of health and safety were improved after moving to a SPR unit. Ferri et al. (2015) conducted a qualitative study utilizing interviews at multiple time points to explore the experience as they transitioned and settled into their new setting. In the early phases, Ferri et al. (2015) indicated multiple safety concerns from the nurses' perspective at the first time point. These concerns were rooted in increased distance from patient, isolation, impacted visibility and hearing of alarms, and inability to communicate effectively. Interestingly, later in the study after becoming accustomed to their environment, nurses' safety concerns decreased, although they remained concerned about their distance from patients and communication concerns (Ferri et al., 2015).

2.7 Visibility

The transition from open bay to SPR naturally impacts the sightlines as patients are no longer in one room and without appropriate intervention this can create serious patient and staff safety concerns (Winner-Sholtz et al., 2018; Maben et al., 2016; Donetto et al., 2017).

Using an architectural theory developed by Juhan Pallasmaa, Donetto et al. (2017) analyzed the interview data from Maben et al. (2016) to create three foci all surrounding the effects of visibility change as result of transitioning to SPRs. The most impactful was the loss of

"peripheral" vision in SPRs in respect to patients and colleagues. Interview participants noted losing situational awareness - referring to "a person's perception and understanding of the dynamic information that is present in the environment" (Canadian Medical Protective Association, 2013). Loss of situational awareness suggests that the transition to SPR diminished nurses' ability to visualize and monitor patients as well as colleagues.

Maben et al. (2016) indicated a perceived increase in falls of their patients due to decreased visibility however, the increase was temporary and returned to pre-move state within the year. Maben et al. (2016) found that the sightlines of nurses were impacted but could be avoided with evidence-based design, such as large transparent doors, observation windows and advanced monitoring technology. Maben et al. (2016) also indicated the combination of communication and visibility concerns impacted the informal learning opportunities available to new staff. Nurses noted fewer opportunities for role-modelling and observation (Maben et al., 2016)

2.8 Gaps in the literature

Although there is a general consensus of improved teamwork after transition to SPR, concerns remain regarding communication, isolation and visibility of newly developed units. Furthermore, the literature agrees that use of evidenced based design, proper implementation of technology and development of new nursing processes are critical to the success of transition (Winner-Stoltz et al., 2018; Maben et al., 2016; Doede et al., 2018). The goal of re-development is improved patient and staff satisfaction that leads to high quality care and without proper evaluation, there is no way to confirm this.

Furthermore, as noted above, the majority of studies, with the exception of Maben et al. (2016) and Donetto et al. (2017), studied the transition of a Neonatal Intensive Care Unit. As the

rest of the healthcare world transitions to SPR, it is integral to obtain accounts of transition experiences from other specialties such as Anesthesia Care Units, Medical -Surgical, Emergency, General Pediatric and Pediatric Intensive Care. As the needs of these units vary greatly, understanding their perspectives is critical to the success of transition.

Finally, the studies in this literature review were primarily quantitative, utilizing surveys as means of data collection. Considering the nature of concerns, such as isolation, communication and patient safety, there is significant value in a qualitative evaluation of this transition. Understanding the nuances of barriers and facilitators through spoken word and without being constrained to a rated scale has the power to create significant impact. Therefore, by identifying these gaps in knowledge a qualitative descriptive study exploring the experience transitioning to a 100% SPR hospital was developed. Utilizing focus groups and content analysis, this study will fill the gap by using qualitative data to understand the perceived experience from RNs working in a new 100% SPR pediatric hospital.

2.9 Conclusion

Due to the patient advantages, SPRs are likely to become the standard of care across all areas of care; the problem now lies with identifying solutions to problems such as staff isolation, teamwork and communication concerns and visibility obstacles. As hospitals around the world are redeveloped, integrating key stakeholders, particularly RNs into development and re-development committees would aid significantly in protocol implementation and hospital design.

Chapter 3: Methods

The purpose of this study was to understand nurses' perspectives of transition from multi-patient rooms (MPR) to single patient rooms (SPR) in one pediatric hospital unit that recently underwent this transition. Little is known about nurses' perspectives of transition from MPRs to SPRs, although there are significant changes to a unit's geographic layout and to nurses' workflow. This chapter will describe the methodology of the study. This includes identifying the study design, inclusion criteria, sample and setting. Furthermore, recruitment strategies, data collection, data analysis, ethical considerations, and reflexivity will be explored within the context of this study.

3.1 Methodology

I determined qualitative descriptive design would be an appropriate methodology to address my research study. Bradshaw et al., (2017) describe qualitative descriptive as studies that "seek to discover and understand a phenomenon, a process or the perspectives and worldviews of the people involved" (p. 1). This approach is particularly useful when information is obtained directly from those experiencing a phenomenon (Bradshaw et al., 2017). I used this approach to explore nurses' experiences with the MPR to SPR transition based on their day-to-day experiences with the transition process.

3.2 Ethical Consideration

I received ethics approval from the University of British Columbia Behavioral Ethics Board (UBC REB) and program utilization approval from BC Children's Hospital. There were minimal risks associated with this study. Breach of confidentiality was the most significant ethical concern. At the beginning of the focus groups, participants were asked to respect the

confidentiality of others in the group and not repeat or share information outside the focus group. Informed consent was obtained, and the participants were aware that their participation was voluntary.

3.2.1 Data Security

Data security was maintained as indicated in the approved REB application. Contact information was kept in a secure password protected and encrypted research computer. This information was only used to contact interested participants for the purpose of the study. All electronic data from the study was stored on the research computer, including uploaded audio recordings from the digital voice recorder. I transcribed and de-identified the audio recordings of focus groups. Hard copies of de-identified transcriptions were used by members of the study committee to discuss the coding/analysis strategies.

3.3 Study Design

3.3.1 Setting

The study was based on four MPR to SPR perioperative units. Permission to conduct the study with RNs in these units was given by the hospital director. The MPR to SPR transition took place on these units approximately two years ago. Prior to the move, all patients, monitors and nurses were in one large open space or bay. With the current SPR arrangement, each room accommodates one patient and their family. There are movable partitions between two rooms that can be opened for nurses to monitor patients on both sides of the partition. Each room also has windows for viewing

Vocera, a new communication technology, was introduced to facilitate communications among healthcare providers. For context, Vocera is a small walkie-talkie type of technology. It is worn on the collar of the provider's clothing. Vocera allows two-way communication. For

example, RNs can use Vocera to call out or to receive calls. There have been challenges with Vocera use. For example, users must know the first and last name of the person or their role and title. Nurses, particularly in SPRs, do not always have ready access to contact information. Furthermore, Vocera uses voice recognition, and the device must be able to understand the caller. In a high stress situation, such as a code, extraneous noise and a stressed voice may not properly activate Vocera.

Prior to the move, RNs were trained as either pre-operative or post-operative care providers. Before the transition took place, all RNs received training to care for all perioperative patients. This new care delivery approach was instituted to provide more holistic care for patients with all pre-operative and post-operative care happening within the same SPR.

3.3.2 Sample

Our inclusion criteria were: a) a point of care RNs working within one of the four units b) experience with both types of units. Convenience and snowball sampling were utilized for this study. Convenience sampling is a non-probability sampling method by means of recruiting participants based on availability and convenience (Polit & Beck, 2017). Snowball sampling complements convenience sampling as another non-probability sampling method by using the already recruited participants to refer others to the study (Polit & Beck, 2017). Convenience sampling allowed for the RNs to identify themselves as potential participants by contacting the researcher while referring others after their participation in the focus group. After recruitment, the sample included two focus groups with four and three participants respectively in each group for a total of seven participants in the study.

3.3.3 Recruitment

A study poster was placed in staff lounges and information boards of the four units (Appendix A). A study email (Appendix B) was sent to all perioperative nurses s twice over four months. Recruitment began in May of 2019 and concluded in August 2019.

3.4 Data Collection

Two focus groups were organized based on respondents' preferences. Focus groups provide a unique opportunity to observe social interactions within the group and understand the shared experience after an event, such as transitioning to SPR (Thorne, 2016). Both focus groups were held at the hospital in a private meeting room. Pizza was provided as an incentive to participate.

The focus groups questions are included in Table 1. Focus groups were audio-taped to record all participants' statements while I took field notes and facilitated the discussion. Field notes are objective descriptive and reflective memos used as means of recording information about interactions, dialogue or general notes (Polit & Beck, 2017).

Table 1. Focus Group Questions
1. What has it been like to work in the new single patient room occupancy layout?
2. Tell me how your experience with single room occupancy is different from your work experiences in other types of geographic layouts?
3. How has your workflow changed after transitioning to the SPR layout?
4. Can you tell me something you find advantageous to working in SPR?
5. Is there anything you find is disadvantageous to being in SPR?
6. How have your relationships with co-workers and colleagues been after transitioning to SPR?

3.5 Data Analysis

As the researcher and data transcriber, I was immersed in data collection while simultaneously orienting myself to data well before formal analysis began. I verified the transcription by re-reading and listening to the audiotapes (Polit & Beck, 2017). After a comprehensive review of the literature I identified the following themes: Teamwork, Communication, Isolation, Visibility and Relationships. Using these themes as a deductive coding framework, I coded the focus group transcriptions with the assistance of my thesis supervisor. We also located exemplar quotes for the five major themes. Although I looked for additional themes to emerge (i.e., inductive coding), I was able to code both focus group transcriptions using the five themes from the literature review.

3.6 Trustworthiness

When participants share their views with researchers, they trust researchers to accurately represent their opinions, concerns and feelings. Granehim & Lundman (2004) discuss the importance of trustworthiness to qualitative research. Trustworthiness is defined as "the degrees of confidence qualitative researchers have in their data and analyses, assessed using the criteria of credibility, transferability, dependability, confirmability and authenticity" (Polit & Beck, 2017, p. 747). Furthermore, an integral aspect of qualitative research is reflexivity. This was especially important considering my personal and professional context.

Reflexivity as per Polit & Beck (2017), "involves attending systematically and continually to the context of knowledge construction" (p. 561). Researchers must be aware of their own biases, opinions and previous knowledge throughout the study. As a nurse who transitioned from MPRs to the SPRs within the hospital, I had to reflect on my perceptions of what the change meant to me. To avoid conflict of interest, I did not conduct focus groups with

nurses on the unit where I work. Nevertheless, I found that as I listened to the nurses and as I analyzed the data, I compared my experiences to theirs. Reflexivity with notetaking was an important process for me to acknowledge my perspectives versus those of the focus group participants.

Credibility as per Polit and Beck (2017) is the "confidence in the truth of the data and interpretations of them" (p. 559). One way to ensure credibility is through member checking with focus group participants, which was not possible for this study. Instead, I worked closely with my supervisor, a qualitative researcher, and we did consistency checks on all my coding.

Dependability is defined as the reliability of the data that it can be replicated and repeated with similar results with a different population (Polit & Beck, 2017). My supervisor and I used a deductive coding framework with operational definitions for the five themes. This coding framework with definitions can be used by other researchers. In addition, I have described the coding process I used for replicability.

Confirmability is the confirmation by independent parties that the findings are representative of the participants' voice (Polit & Beck, 2017). I did consistency checks with my supervisor and presented my findings to my thesis members for further confirmability. Although this study took place in a specific context (i.e., perioperative units with MPR to SPR in one hospital), I provided a description of the setting and sample and transition process so that others can compare their own MPR to SPR units and experiences to those from the study.

Authenticity is defined as "the extent to which researchers fairly and faithfully show a range of realities" (Polit & Beck, 2017, p. 560). I attempted to represent the tone and views of the participants by using verbatim exemplars throughout the findings and providing context within the discussion.

3.7 Summary

This chapter described the methodology used to conduct this study. Qualitative descriptive was determined to be the most appropriate methodology to explore the transition from MPR to SPR. Two methods of recruitment were utilized to recruit seven participants for two focus groups. Ethical concerns and reflexivity were discussed. Chapter 4 will identify the findings of our data analysis.

Chapter 4: Findings

This chapter will describe the themes and sub-themes I identified from the literature. The three main themes were structural changes, process changes and relational changes. The following sections include sub-themes associated with the three main themes, as well as definitions and exemplar quotes for each theme and sub-theme. The themes and sub-themes with basic definitions are in Table 1.

4.1 Definitions

Table 2. Themes & Sub-Themes

Theme	Subtheme	Definition
Structural Changes	Visibility	Visibility or "sightlines" are disrupted by SPR physical layout (walls, doors) the physical structure (Merriam-Webster, 2020).
	Situational Awareness	Situational awareness is being aware of what is going on around you (Fore & Sculli, 2013).
	Isolation	Isolation refers to a perceived separation from others, specifically co-workers in this context (Merriam – Webster, 2020)
Process Changes	Clinical Communication	Clinical communication is professional communication between healthcare practitioners and with patients (Kourkouta & Papathanasiou, 2014)
	Teamwork	Teamwork is the collaboration required and ability to work as a high functioning team towards a common goal (Xyrichis & Ream, 2007)
	Nursing Process	Nursing process refers to the systematic approach to planning and delivering patient care. Nursing process begins with patient assessment, followed by care planning

		and delivery and ongoing evaluation of patient status (Yildirim & Ozkahraman, 2011)
Relational Change	Relational Practice	Relational practice is the "process of respectful, compassionate and authentically interested inquiry into another's experience" (Hartrick Doane, 2002, p. 401)
	Relationships with Coworkers	Relationship with co-workers refers to the meaningful social connections made with colleagues in a professional context (Peltier et al., 2008)

4.2 Structural Changes

Structural Changes are changes in nursing care delivery due to physical aspects of SPR versus MPR layout. Prior to the transition from MPR to SPR, care was delivered to patients in an open bay area where nurses could see all the patients and all the healthcare providers. With the SPR layout, visibility of other patients and other providers is restricted, and nurses must exit rooms to get a perspective of unit activities. The three sub-themes related to structural changes are: visibility, situational awareness and isolation. See Table 2 for sub-theme definitions from the literature.

4.2.1 Visibility

Visibility was frequently mentioned by the two focus groups with respect to "loss of sightlines". A sightline is a hypothetical line from the eye to a point of reference (Merriam-Webster, 2020). Within the healthcare context, an example of a sightline is a nurse's unobstructed view of patients or monitors from the nursing desk.

Nurses described how of visibility or loss of sightlines influenced their capacity to assist each other with patient monitoring and care, and it also influenced their capacity to monitor each other for needed breaks and respite.

> "When we were in just the open room…You would have your airway patient and I'd be right beside you. I could see you or I could hear the monitor and we could say "Do you need help" Do you need us to call a code for you?" P03

> "We lost the sightlines, so you have all of these tools we are having to use to keep things in order, to remind yourself who's where, who needs to go for a break, who starts at what time and who needs to get out of here" PO1

Loss of visibility is often managed by leaving window coverings open and by opening partitions between rooms. In these situations, a challenge for nurses was breech of privacy for families.

> *"*We can't close the curtains or the doors or the blinds or anything because of sightlines, right, so, you're trying to maintain confidentiality but safety trumps confidentiality, so you can't draw the curtain" PO1

Participants with charge nurse roles indicated that SPR created challenges for them with respect to bed allocation and nursing assignments.

> "We've lost a lot of our sightlines right, sometimes when you're in charge, and you know there's a really acutely sick patient coming in, so you want this patient right across from the nursing station" PO1

> "You have to be in the room for a lot of them and you can't take on another assignment unless its right beside you and there's only one break away door, where in the old building, you could take either or, the left or right side, you don't have to take only one side down." PO2

All focus group participants agreed that visibility concerns were an inevitable aspect of SPR physical layout.

> "We lost the sightlines. That's never going to change so that will always be a stressor we didn't have before" (PO1).

4.2.2 Situational Awareness

Situational awareness is defined as being aware of what is going on around you (Fore & Scully, 2013). The structural design change from MPR to SPR positively influenced nurses' situational awareness of their patient status and needs.

> "It [SPR] has increased my work-load. But it's also enabled me to make sure that my patient and family are completely cared for before they are discharged from the hospital and I know exactly what is going on with that patient" PO5

> "Parents can be focused on you as you're giving, and they're still sleeping and then we can wake them up together and it's just like a more streamlined process and I think it's better for families." PO7

Despite its positive effects on patient care, SPR adversely influenced nurses' situational awareness of activities going on outside their patient room in comparison to MPR. Participants further noted the impact on their ability to work as a team due to their unawareness of each other's' activities.

> "In the old building we had the sightlines to see what was going on in the unit. If you knew it was busy, you kind of figured "well the breaks are going to be a little bit delayed", but when you're in patients rooms, you're kind of in your own little world" PO2

> "You could hear the ORs, you could hear everything that was going on around us now, you're in that room, isolated, chit chatting with your family, you have no idea that it's like crazy out here and you need to move things along." PO1

> "You miss that ability, as a bedside nurse, to know what's going on in the entire unit. You don't know what someone 3 doors down is desaturating or might need a hand so it's a big change" PO5

4.2.3 Isolation

The final concept of the structural changes theme is isolation, which refers to nurses' perception of being alone and lacking support by being in SPRs without ready access to other nurses or the charge nurse.

> "Sometimes you're in one of the rooms that's like around the corner, out of sight and there isn't another person to write for you and you're like… okay I'm in the corner, with a patient that might have an airway, it's a bit, you're just like, you feel a little bit isolated. PO1

> "I feel like more than once it's come up where someone's has been like "oh has anyone seen so and so?" and you don't know, there's the alcoves, there's the rooms and I don't know, maybe they went upstairs maybe they went, you just don't know. It's hard to keep track of people" PO4

Being isolated also generated focus group discussion about accountability. Participants indicated that when they are by themselves in SPRs, they feel as if the burden of accountability for safe, quality care is solely on them.

> "I think the other thing, again, is going back to being isolated in that room. You might just be chatty, but again, you're not aware of what's going on in the unit. So, in the old building, you're aware, like all the spots are filling up, it seems really busy, I better move along." PO1

> "It's harder, because sometimes there is a patient for that nurse they're just in the corner and they're been in phase one for so long. "oh, anyone seen this person?", "Oh they're still with that patient!" "Oh, there's a patient over there?"" PO2

4.3 Process Changes

Process change describes the impact of SPR design on the processes associated with nurses' care delivery. The three sub-themes were teamwork, communications and use of nursing process. The participants indicated improved teamwork, impacted communication and adapted nursing processes.

4.3.1 Clinical Communication

Clinical communication will be explored here while non-clinical communication will be explored within the relational changes theme. Clinical communication refers to nursing communications about patients and their care delivery.

Vocera, a new communication technology, was introduced to facilitate communications among healthcare providers. Although Vocera should aid communications, the transition to Vocera and other technology issues were seen as obstacles to safe clinical communications among focus group participants. The initial plan with Vocera, was to phase out other forms of communication, such as cell phones and pagers. Unfortunately, not all forms of other communication were phased out at the time of this study, and focus group participants stated that there was no one consistent way to contact essential staff and clinicians. Focus group participants were concerned with Vocera's practicality: they explained that users must know the first and last name of the person or their role and title. In SPRs, access to this information is often lacking.

> "Communication is definitely different. You have to think about it more, you have to be more aware of who is in your environment, who you can call." PO5
>
> "You are stuck in this room, there is no way to communicate." P02
>
> "I have definitely been in a situation where I literally can see no one that I can call to, never in an urgent situation but like, I need a Popsicle and a blanket for this kid or whatever. And there's been no one in sight and even if I kind of raised my voice no one hears me" PO7

These quotes exemplify the connections between the structural and process sub-themes of communication, visibility and situational awareness while also highlighting potential for safety concerns for patients. As one example, there were challenges with Vocera, Focus group

participants, noted however, that Vocera provided them with an increased sense of safety by counteracting a sense of isolation and loss of visibility.

> "I feel safe with my Vocera on my chest" PO7

4.3.2 Teamwork

Teamwork refers to collaboration among team members with a common goal of reaching best possible outcomes together (Salas et al.,2008). For this study, participants reported that they had initial fears about the impact of SPRs on teamwork. However, they found that their teamwork actually improved after the transition to SPRs.

> "I had a lot of fears coming into a SPR room and I think it's really changed the team dynamic, we work better together now that its single rooms" PO5

> "I think they can be really proud of what we do and I think it's really helped make us feel more like a team, like we can count on each other." PO5

Prior to the move from MPR to SPR the unit was separated into pre-operative care, post-operative care and post anesthesia care. To support a patient -centered model of care in SPRs, these separate phases of patient care were amalgamated and nursing staff from the separate MPR units were cross-trained to all phases of perioperative care delivery. In the SPRs, nurses manage all three perioperative phases of patient care. The focus group participants indicated that amalgamation and cross-training created a greater sense of team identity by creating one unit of perioperative services.

> "I'm not sure if it's just the fact that now I'm trained in both areas but, I feel more like a part of the team" PO7

> "Overall, I get the sense of feeling more organized" PO7

> "The workflow has definitely changed in that um I now caring for a patient through the immediate post op phase and then secondary phase, then I'm doing all the discharge teaching at the same time" PO5

> "I'm spending a lot longer periods of time with my patient and family going in and doing teaching so that is a huge change for me cause I never did any of that in the old building because I didn't work in the surgical day care part." PO5

Participants speculated that the planned, systematic transition to the SPR layout helped solidify their identity as a team. Participants noted how the transition to SPRs was a gradual process so that team members could accommodate to their new routines. Nurses were engaged in the transition process, and this engagement helped establish a sense of "team" throughout the transition process.

> "ACU had the opportunity to do a very staged transition to the new space which I think is very important. They opened 1 OR, people had the time to get adequately adjusted." PO6

Participants indicated that despite transitional challenges, for example, simulating SPR with curtains, the unit as a whole has adjusted and adapted to their new environment.

> "It was a bit of a mess with the curtain and stuff. I like the flow better, it's such a well-oiled machine" PO6

4.3.3 Nursing Processes

Nursing process is a systematic approach to planning and delivering patient care. Nursing process begins with patient assessment, followed by care planning and delivery and ongoing evaluation of patient status. Nursing process is cyclical, characterized by constant data collection, data processing and care delivery adaptations to ensure care meets each patient's unique needs in real-time (Kozier et al., 2004). During transition from MPR to SPR, the nurses

and leadership recognized that nursing process often required two nurses for complex patients- one nurse to assess and another nurse to document and act as a back-up. Post-operative patients are typically considered high acuity because of their physiological lability after surgery. In MPRs, one nurse could be at the bedside with other nurses available as needed.

> "In the old building, even though it was open concept, when you admitted a patient, very often, you were admitting by yourself. You were doing the writing, and the patient assessment at the same time." PO5

> "Remember in surgical daycare when we would get a transfer form PACU and we would have like 2 bays of patients, you never really knew who was there or like who was coming or going, or what stage they were at, in terms of being ready to go home, whether or not the teaching had been done, cause it was just kind of chaotic" PO7

> "In the old building but I'm right next to you so I could chart for you while still keeping an eye on my patient but now again, unless, as [redacted] said, there's the breakaway wall" PO1

In SPRs, two nurses must be assigned to manage one patient at risk for physiologic instability and decompensation.

> "I think patient ratios has changed, in the sense that, when we were taking care of a patient in phase 1, or phase 2, [in the old building] then we kind of eye balled them, stayed kind of step away a little more with those types of patients. Whereas these ones you have to be in the room for a lot of them and you can't take on another assignment unless its right beside you and there's only one break away door, where in the old building, you could take either or, the left or right side, you don't have to take only one side down." PO2

> "Generally, it is set up so that you admit, someone is there is write the initial vital signs for you, get that early paperwork done so there's definitely more team work and assistance built into this system than there was in the old open concept" PO5

> "You need a minimum of 2 nurses on the 4th floor. So, at the end of the day, even though one nurse is taking care of the patient [on the 4th floor], you need the second nurse up there. If they were all on one floor, you can use that second nurse to take another patient or do break relief." PO1

> "The bigger footprint is definitely tricky, but we've adapted to that. If someone is having a potentially difficult admission, we'll make sure they have an extra 1 or 2 people there to help." PO7

The language of this quote is notable. The focus group participants frequently referred to themselves as "we." Although nurses in MPRs were described as a team, the transition to SPR raised their sense of team functioning; being able to support each other as a perioperative services team.

4.4 Relational Changes

Relational changes refer to changes in relationships with coworkers and with patients and families. Participants indicated improved relational practice with patients. There was a general consensus that SPR supported patient centered and individualized care. Participants also indicated that although there were fewer opportunities for social interaction, when the moments arose, they were more meaningful in comparison to MPR.

4.4.1 Relational Practice

Relational practice refers to "a process of respectful, compassionate and authentically interested inquiry into another's experience" (Doane, 2002, p. 401). Participants indicated that SPR supported relational practice with patients and families more than in MPR.

Focus group participants frequently commented on their capacity to build better therapeutic relationships with families. Instead of focusing on tasks, time with families in the SPRs enabled them to get to know the families and patients more holistically—and to care for their social, emotional and physical needs. Participants said that they knew patients preferred this care because of their positive affect.

> "Although it might be a little bit harder for us and walk more and bigger space, ultimately, knowing that [families] are comfortable makes me feel so much better." PO6

> "I think just ultimately, it always comes back to patients and families and I feel like they are happier and when they're happier, we're less stressed." PO5

> "The parents can be focused on you as you're giving [care], and they're still sleeping and then we can wake them up together [parent and patient] and it's just like a more streamlined process and I think it's better for families" PO7

> "I feel like less anxiety when I'm looking after families who are happier. I feel like I can give them the dignity and confidentiality and respect and quiet healing space that they deserve." PO6

Although the focus group participants acknowledged challenges with SPRs, they recognized how having the family together in the room was very important to the families—an important component of patient-centered care.

> "All of the family can come in and that is such a big thing for post op families, grandma and grandpa want to see the kids, there's little siblings that were upset or in the stroller or something like that, I mean it gets crowded and it gets a bit overwhelming sometimes if you kid is really busy, But it's so nice that the whole family can be there, they can settle in, there's places for them to sit, chairs that don't tip over. Yeah, that's huge." PO5

4.4.2 Relationships with coworkers

An important part of effective teams is developing social bonds to one another (RNAO, 2013). Relationships with coworkers is a sub-theme related to non-clinical, social relationships among co-workers. Participants noted that creating and maintaining meaningful connections was challenging in SPR, indicating that it took more effort to find the time and space to develop the social bonds. This being said, the participants agreed that despite the increased effort, they were successful in developing and maintaining their social connections since the transition.

> "We still work really well as a team but we're having to work harder to actually connect with each other because of the Vocera or sightlines" PO1

The participants indicated that previous social connections pre- transition helped with relationship development post-transition.

> "I think socially, our group because we work so well as a team on the X and Y floor, working together to help patients, it has really helped solidify us as a group of really strong nurses." PO6

Participants indicated that they expended more effort to make their interactions with each other "quality time."

> "I have to be more proactive about listening to what happened to them yesterday and having good quality conversation when were out together around the desk because you are taken away from that general milieu when you're in the patient room" PO6

Participants noted those occasions, even brief ones, such as change-of-shift, were used as opportunities to connect socially with co-workers.

> "I feel like I really am able to get to know people a little bit better in this environment actually, because before, it was quite crowed around those little desks in like surgical daycare and the families are all around so you couldn't really socialize that much because of parents and families." PO7

> "I feel like when I have a buddy coming in to like write for me, when I first admit a patient, there's always that little bit of down time, where I can be like " but how was that vacation, right?" PO7

4.5 Summary

In this chapter, three key themes and their sub-themes were defined and exemplified through focus group quotes. Structural changes explored the RNs perception of impacted visibility, situational awareness and isolation. Process changes indicated that RNs perceived clinical communication to be impacted by SPR, teamwork to be improved due to a previously developed high functioning team and identified the need for adapted nursing processes prior to and during transition to SPR. Finally, Relational Changes indicated that SPR structurally reinforces patient centered care and although SPR decreased frequency of interactions, it increases the value of social connections. In chapter five the connections between the themes and

sub-themes will be highlighted, and links to the literature will be made. The implications of research will be discussed, and the limitations of the study will be identified.

Chapter 5: Discussion

In this chapter, I will support my findings of structural, process and relational changes with available and relevant literature. Additionally, I will identify the implications of our findings on nursing practice, future hospital development and future research. Finally, I will discuss the limitations of our study and knowledge translation strategies in an attempt to disseminate our findings.

5.1 Discussion

The goal of hospital re-design and development is increased patient, family and staff satisfaction, increased patient safety and improved clinical outcomes (Watson et al., 2014). Utilizing evidence-based design (EBD) to guide development provides the greatest likelihood of successful transition for all stakeholders, patients and staff alike (Ulrich et al., 2008).

SPR has been identified as the standard of care for new hospital and unit design (FGI, 2006). This recommendation is based on decreased infection rates and increased satisfaction from a patient perspective (FGI, 2006; Taylor et al., 2018). Patients identified improved privacy, confidentiality and comfort as advantages to SPR (Taylor et al., 2018). Despite the evidence of patient preference, there is limited literature describing healthcare provider perspective on working and delivering care in SPR.

The purpose of this study was to explore nurses' perspectives of the differences between MPRs and SPRs. Participants in this study had undergone a transition from multi-patient rooms (MPR) to single patient rooms (SPR) within the last two years and could contrast the two types of layouts. Based on nurse reports, this study found that there were structural, process and

relational changes to care delivery after transition from MPRs to SPRs. Each type of change is discussed below.

5.1.1 Structural Changes

Structural changes from MPRs to SPRs were impaired visibility, decreased team/unit situational awareness and increased sense of isolation as a result of the transition to SPR. Nurses noted how visibility in SPRs is limited by walls and doors that separate nurses from each other and their patients. Nurses aren't aware of what's happening outside the room, and when nurses are outside the rooms, they have limited visibility of patients in the SPRs. Prior to the transition, nurses in MPRs had full visibility of each other and all the patients. In a multi-method study of patient and nurse perspectives of SPRs in a newly designed hospital, Maben et al. (2016) found that the loss of "panoptic visualization", meaning undisturbed sightlines, was the most significant disadvantage for their participants (p. 96).

Although curtains and sliding partitions can be left open to improve SPR visibility, Shahhediari & Homer (2012) indicated in their systematic view that these actions raised concerns about patients' privacy rights. Other research has raised safety concerns related to SPR visibility (Walsh et al., 2016; Ferri et al., 2015). Walsh et al., (2016) indicated in their survey study that nurses only felt safe caring for patients in SPR as long as staffing was adequate (1:1 for critically ill and ventilated patients) and they had unobstructed view into the room with no curtains drawn. The participants indicated further concerns with disturbed visibility from a staff assistance/ availability perspective. Ferri et al. (2015) conducted a multi-stage qualitative study interviewing SPR end-users (nurses, Respiratory Therapists, Physicians and support staff) and found a perception of safety concerns due to decreased visibility and isolation from co-workers.

Findings from this study on visibility concerns, therefore, are supported by other research evidence.

Related to impaired visibility is a sense of isolation. In this study, multiple participants indicated that they frequently found themselves alone and isolated in a patient room. Winner-Stoltz et al (2018) conducted a survey study that compared MPR with SPR neonatal intensive unit (NICU) designs. The researchers indicated that their nurse participants and neonatal parent participants experienced various levels of isolation after transition to SPR. Nurses also indicated that smaller tasks (e.g. getting a warm blanket for a patient) were challenging to fulfill as they felt they could not leave their patient. In addition, nurses described having a different mindset in SPR; paying extra attention to others around them in order to feel less isolated and more supported. In another NICU survey study by Watson et al. (2014), interventions such as frequent rounds and use of a voice activated communication system decreased isolation in SPRs. In my study, participants also indicated how communications with Vocera was one way to increase their perceptions of safety however, they did not explicitly indicate that it decreased their isolation.

The final component of structural changes is situational awareness. Situational awareness refers to "a person's perception and understanding of the dynamic information that is present in the environment" (Canadian Medical Protective Association, 2013); essentially being able to recognize what is going on around them. My findings indicated that the participants' situational awareness of their patients' needs was amplified in SPRs, while lack of visibility and increased isolation adversely affected the situational awareness of activities outside the SPRs. The participants frequently indicated they didn't realize when the unit was busy or when their co-worker's patients were decompensating. Winner-Stoltz et al. (2018) found that SPR increased

the nurse's ability to focus on their patient. Swanson et al. (2013) conducted another survey study with patients and providers, surveying them after transition from an open ward to SPRs. The researchers found that nurse participants in this study indicated no change in their own situational awareness, but they thought that other healthcare providers' situational awareness was adversely impacted by SPRs. Swanson et al. (2013) attributed nurses' reports of unchanged situational awareness to nursing group rounds, which kept them up to date on admissions, transfers and discharges.

The literature supports my study's findings that SPRs can enhance nurses' capacity to focus on their patients' needs, but there are safety limitations associated with structural changes that must be addressed, particularly with respect to decreased visibility and situational awareness and increased isolation.

5.1.2 Process Changes

In my study**,** process changes were changes to the nursing process, communications, and teamwork after transition from MPRs to SPRs. Nursing process refers to the systematic way in which nurses assess, plan and deliver care to patients (Kozier et al., 2004). In my study nurses acknowledged how they provide better continuity of care for patients in SPRs because they care for the same patient from admission to discharge. Participants also noted that some phases of nursing process, such as admissions, may require two nurses to be in one SPR at a time, necessitating more available staff. Prior to the transition, in open room MPRs the nurses could support each other with admissions while maintaining responsibility for their own patients. Maben et al. (2015) and Winner-Stoltz et al (2018) similarly noted how SPRs may require additional staff to safely manage higher acuity patients. Lin et al. (2016) conducted an ethnographic study exploring the challenges perceived by adult intensive care unit (ICU) staff

after introducing an SPR model of care. This change to SPRs necessitated having readily available supports for unstable or acute patients.

Participants in my study perceived clinical communication processes as being adversely affected by the transition to the SPR between nurses as well as between nurses and other providers (e.g. surgeons, anesthesia, specialty physicians). Clinical communication refers to the professional communication between providers regarding patient, unit or hospital needs (Kourkouta & Pspsyhsnsdiou, 2014). Study participants indicated that the breakdown in communication was directly related to the structural changes that arose from the transition to SPR. The visibility, isolation and other structural challenges negatively influenced their communication capacity. Vocera was implemented in an attempt to counteract any communication challenges however, the nurses in my study indicated activation problems with the device, especially under stressful conditions. Some participants indicated, however, that once they figured out how to work with Vocera, it provided comfort in terms of safety and two-way communication.

The literature indicates that Vocera is a positive addition to the communication tools available (Bosch et al. 2012). Breslin et al. (2014) conducted a prospective mixed methods study evaluating the implementation of Vocera from the health care provider (e.g. nurse, physcian and unit coordinator) perspective. These researchers found that Vocera saved time and provided statistically significant workflow improvement in terms of quality care and efficiency. Swanson et al. (2013) also indicated that their nurse participants felt that Vocera positively influenced their communications and their ability to deliver quality care. Nurses' issues with Vocera in my study suggest the need for further education on Vocera and its capabilities.

Teamwork underwent process changes as a result of transition to SPRs. Teamwork refers to the ability to function as a group to achieve a collective goal (Salas et al.,2008). My study participants indicated that functioning in SPR required a change in team dynamics, but ultimately, they felt that they were a stronger team. They described themselves as strong teams (on different units) before transition and they had fears about what would happen to their sense of "team" after transition. Because the organization cross-trained all nurses prior to transitioning from MPR to SPR, the participants felt that the preparation and appreciation for each other's roles and competencies settled their fears. In fact, in the focus groups they expressed a collective sense of pride in their work. Some literature on transition from MPRs to SPRs found that their study participants reported similar fears, and these fears were successfully addressed through education and concerted efforts to organize team bonding activities, such as sponsored lunches (Bosch et al., 2012; Watson et al.,2014; Winner-Stoltz et al., 2018).

Maben et al. (2015), however, found that in spite of intentional rounding, nurse's morale remained low and teamwork was adversely impacted and did not improve throughout the first year after transition from MPRs to SPRs. The researchers attributed the low morale to factors, such as visibility concerns, unchanged patient ratios, isolation, and challenges with communication and teamwork. Magdzinksi et al. (2018) conducted a qualitative study to describe the preparation needed to transition from an adult intensive care unit MPR unit to an SPR. Despite nurse preparation for the transition, the researchers found that increasing isolation and poor situational awareness negatively affected nurses' reported capacity to function as a team (Magdzinksi et al., 2018). The literature and my study findings suggest that the transition process needs to consider nurses' fears and how to resolve them through evidence-based approaches such as education. Furthermore, re-evaluation of processes and workflows and

sustained mentorship are indicated as means of support during the transition (Magdzinksi et al., 2018).

5.1.3 Relational Changes

In my study nurses described improved relationships with their patients and with each other after the transition from MPR to SPR**.** Relational Practice is "a process of respectful, compassionate and authentically interested inquiry into another experience" (Hartrick Doane, 2002, p.401). As noted above, SPR structurally re-enforced patient centered care through increased time spent with the patients and their families and enhanced continuity of care Participants felt that they became more attuned to providing holistic care, shifting their focus from tasks to relational practice and care interventions for patients' physical, emotional and social needs.

Maben et al. (2015) found that their nurse participants reported challenges with providing high quality care to their patients. Maben et al. surmised that this was due to workload and higher patient ratios. In their survey study, Winner-Stoltz et al., (2018) indicated that positive interactions with families were reported by nurse participants, but the survey data did not include questions about relational practice or patient-centered care. Doede et al., (2018) conducted a generic literature review of the effect of NICU layout on nurses' work and found two studies that identified SPR as increasing the quality of interactions with parents however, this data was based on one item on a quantitative survey study. Two further studies identified by Doede et al., (2018) indicated that SPR allows care to be individualized in SPR more effectively than in MPR.

In my study the nurse participants frequently indicated that patients and families preferred SPR to MPR. They identified privacy, confidentiality, physical capacity for more family members to be present and safe space to heal as advantages to SPR from the family

patient perspective. These findings suggest that the positive effect of SPR on the patient and family experience may have positively influenced nurses' perspectives on SPR and perhaps, benefits of this care approach from a relational perspective.

Relationships between the nurses was the final component of relational changes. Despite decreased opportunities for nurse-to-nurse interactions in SPRs, the quality of these interactions increased. The participants acknowledged that they made concerted efforts to use their time together effectively. Participants identified times around the nursing desk and the lull before patient admissions as moments when they could engage in non-clinical, personal communications. The participants indicated that their strong bonds among each other as teams on the pre-transition units supported maintenance of social connections after the transition. They acknowledged that it required increased effort but ultimately, they were able to develop stronger teams despite structural and procedural barriers.

These findings align with the literature that has documented that after transition to SPR, the opportunities for social interaction is decreased due to the increased time spent with patients, the isolating features of SPR and the physical barriers between providers (Stevens et al., 2010; Walsh et al, 2006; Watson et al., 2014). The teamwork literature describes how team members form affective trust with each other over time. This deep, emotional trust underpins members' willingness to back each other up and to care for each other as well as their patients (Baker, Day & Salas, 2006). This body of literature recommends that team members must have regular and frequent opportunities to get to know each other so that trust relationships can form and grow.

5.2 Implications & Recommendations

There is limited literature on nurses' perspectives of transition from MPRs to SPRs. This study has yielded important information with respect to nurses' perceived challenges and successes with the transition to SPRs. Challenges can be addressed by management, such as ensuring opportunities for team interactions, and the successes can be highlighted, such as improved relational practice. The literature recommends that transitions to new models should utilize evidence-based design and ensure integration of point of care staff into the development process (Shaheidari & Homer, 2012). At this organization, both these principles were part of the transition process. Organizational efforts to ensure evidence-based design and nurse engagement contributed to a smooth transition with some positive outcomes.

5.2.1 Implications for Design

Evidence Based Design has risen in popularity and content in the last 20 years (Center for Health Design, 2015). There have been multiple publications indicating the positive influence of SPR on the patient experience and subsequently, recommendations for SPR integration as often as possible have been identified by multiple design institutions (Facility Guidelines Institute, 2006 & The Center for Health Design, 2015; Shahheidari & Homer, 2012). Integrating as many EBD principles as possible can support a successful transition from MPR to SPR.

Maximizing visibility in terms of transparent doors and windows of each patient room is design best practice (Maben et al., 2015; Center for Health Design, 2015) It supports safe monitoring practice and increased ability to deliver safe care (Maben et al., 2015; Center for Health Design, 2015). This study setting adequately integrated these design recommendations by including transparent windows and the sliding doors in between each second room as an additional safety measure.

The Center for Health Design (2015) recommends increased access to communication devices (ex. Vocera and telephones) to support communication between the patient room and the staff members. Again, our study unit addressed this however, as noted above, further education may be indicated to support practicality of the devices.

The final design recommendation is the structural layout of the rooms themselves. EBD dictates that a "circular" or "radial" design addresses all of the concerns above – visibility, monitoring, staff and patient safety and communication. "Circular design" is described as having a central nursing desk at the center of a circle with patient rooms off shooting outwards like the petal of a flower (Seo et al., 2016). This design allows for reciprocal global visibility of the nurses to the patient and vice-versa (Seo et al., 2016). Radial design is simply not always possible from an architectural perspective (Winner-Stoltz et al., 2018; Ulrich et al., 2008). Our study unit utilized a double corridor design which is recognized as the most efficient alternative to a circular design (Center for Health Design, 2015).

5.2.2 Implications for Nursing Practice

The goal of SPR development is to deliver high quality care by increased patient privacy and decreasing nosocomial infection rates however, without adequate recognition of the implication for nursing practice, care delivery issues will arise (Taylor et al., 2018). The implications and recommendations for future development with respect to nursing practice address the structural, process and relational changes as a result of SPR transition. Although, the structural changes are primarily addressed by the implications for design and development, it is important to recognize that the structural development of the space has direct effects on the process and relational changes experienced by the nurses.

Impaired visibility and situational awareness and increased isolation are outcomes from SPR structural changes that are consistently reported across the research literature (Winner-Stoltz et al. 2018; Maben et al.; 2015; Walsh et al.; 2006). Process changes help alleviate some of the negative outcomes from structural changes. For example, one process change may be the need for more staff to maintain quality, safety standards, such as care of unstable or highly acute patients (Walsh et al.,2006; Winner-Stoltz et al. 2018). The transition from MPR to SPR is a significant change that affects all end-users, and it requires adaptations to nursing process. As mentioned previously, the admissions process is a phase of care that often requires two nurses in the SPR. Maben et al. (2018) highlighted the importance of establishing adapted nursing processes prior to and during the transitional period. Nursing process is disrupted due to the structural changes in SPR and the transition can cause a lapse in awareness of how nursing process is affected by these changes (Maben et al., 2018). Nursing process is a "systematic method of giving humanistic care", it is a cyclical and patient centered method of thinking that can be applied to every patient and situation (Yildirim & Ozaharaman, 2011, p. 261). Emphasizing the application and use of nursing process throughout the transition process can help 'ground' nursing care delivery despite structural changes.

Transition can be eased by early and systematic education. This includes orientation education with active learning strategies, such as simulations, and policy and procedure development that recognizes challenges related to SPRs (Maben et al., 2015). Additionally, the inclusion of point of care staff in all development phases will illuminate potential design limitations. Our study participants continue to strongly advocate for new processes in terms of housekeeping and bed allocation, indicating that there are still complexities of the transition

process that require point of care nursing input. The nursing voice is especially important with respect to patient safety (Walsh et al., 2006; Winner Stoltz et al., 2018; Maben et al., 2015).

Finally, introducing unit-based organized social events can alleviate the stress of limited social interaction. Social bonds are an integral component of healthy workplaces and without sustained interactions other components of the workplace will suffer; in particular, teamwork and innovation (Baker et al., 2006; Shalley & Gilson, 2004). During transitions in care delivery, it is important to consider ways to augment and sustain team strengths, such as pre-transition relationships.

5.2.3 Implications for Future Research

There is a need for increased research exploring and evaluating the effect of SPR on nurses' work. It is critical to deepen the understanding of the implications on nursing practice, wellbeing and satisfaction as healthcare transitions to an SPR and patient centered model of care.

Future research should include longitudinal studies that investigate the pre- and post-transition experience of nurses from MPR to SPR (or to any new design). Mixed methods that use surveys and interviews will add richness to our understanding of patients' and nurses' perspectives.

Alternatively, a phenomenological study could explore the lived experiences of nurses throughout the transition to SPR (Bevan, 2014). This type of study utilizes observation and multiple interview points in an attempt to understand a phenomenon (Polit & Beck, 2017). Healthcare will transition to SPR in the coming years and the addition of a highly rigorous qualitative study will greatly support recognition of the changes' nurses encounter during transition to SPR. Eventually, an interdisciplinary team focus should be included, as well as the perspectives of nurse leaders and managers.

Finally, related research should consider staffing needs for SPRs, team development for SPR units and other communication strategies, in addition to Vocera, to ensure effective communications.

5.3 Knowledge Translation

In order for this data to be utilized there has to be knowledge translation (KT) integrated into study design. The first strategy utilized is presenting the research at a conference. This study was accepted to be presented as the British Columbia Patient Safety and Quality Committee (BCPSQC) Quality Forum, this is an especially impactful opportunity as it is in the study site's province at a time when multiple other provincial sites are currently transitioning or have recently transitioned from MPR to SPR. The ultimate goal of this study is to ease the transition for future nurses by exploring their experiences, providing recommendations and communicating the impact SPR has on health professionals. The second strategy will be to publish and distribute these findings for a broader impact.

5.4 Limitations

This study has limitations. Firstly, the sample size was approximately half of the intended size. An increased sample size may have allowed for greater trustworthiness in the reported findings (Polit & Beck, 2017). Further, the study was only completed in one unit which also affects the transferability of the findings. Collecting demographic data may had provided depth to the findings in an attempt to understand the experience across ages, experience and between point of care and clinical nurse leaders. It was not possible to member check without contact information and permission, and member checking would have been a valuable means of increasing credibility of the findings.

The aim of the study was to complete a preliminary exploration in the experiences of nurses after transition from MPR to SPR. Given the exploratory intent of the study, it has only provided a surface level understanding of nurses' perspectives.

Despite my attempts to remain reflexive and rigourous, my place within the organization creates an inevitable bias which lends itself to a limitation of the study. Time constraints with my studies, work and planned graduation are another identified limitation.

5.5 Summary

This chapter situated our findings within the available body of evidence. The majority of our findings aligned with the literature, with the exception of relational practice, which was a finding in this study but not mentioned in other MPR to SPR literature. There is an understanding that SPR is likely to become the standard of care, therefore, these study findings will hopefully inform future development and organization of SPR units and hospitals from the nurses' perspectives.

Our participants exhibited high levels of resilience in the face of significant change. Despite many challenges, the perception of SPR being best for patients and families overshadowed the structural and process changes. In fact, the participants adapted in spite of the challenges to create the best possible environment for their patients and families. The organizational decision to amalgamate the unit, provide extensive education and simulations to systematically transition to SPR supported the successful transition.t. This being said, changes are ongoing.

I have proposed multiple recommendations and implications for nursing practice, future development and future research. As healthcare transitions to SPR and patient centered models

of care, utilizing EBD and recognizing the complexity of transition for nurses and other healthcare providers will support immediate and sustained success.

References

Baker, D. P., Day, R., & Salas, E. (2006). Teamwork as an essential component of high-reliability organizations. *Health services research*, *41*(4p2), 1576-1598.

Bevan, M. T. (2014). A method of phenomenological interviewing. *Qualitative health research*, *24*(1), 136-144.

Bosch, S., Bledsoe, T., & Jenzarli, A. (2012). Staff perceptions before and after adding single-family rooms in the NICU. *Health Environments Research and Design Journal*. *5(*4), 64-75. https://doi.org/10.1177/193758671200500406

Bradshaw, C., Atkinson, S., & Doody, O. (2017). Employing a qualitative description approach in health care research. *Global Qualitative Nursing Research*, *4*, 2333393617742282.

Breslin, S., GRESKOVICH, W., & TURISCO, F. (2004). Wireless technology improves nursing workflow and communications. *CIN: Computers, Informatics, Nursing*, *22*(5), 275-281.

Deode, M., Trinkoff, A.M., & Gurses, A.P. (2018). Neonatal intensive care Unit layout and nurses' work. *Health Environments Research and Design Journal. 11* (1), 101-118.

Doane, G. A. H. (2002). Beyond behavioral skills to human-involved processes: Relational nursing practice and interpretive pedagogy. *Journal of Nursing Education*, *41*(9), 400-404.

Domanico, R., Davis, D. K., Coleman, F., & Davis, B. O. (2010). Documenting the NICU design dilemma: parent and staff perceptions of open ward versus single family room units. *Journal of Perinatology*, *30*(5), 343-351.

Donetto, S., Penfold, C., Anderson, J., Robert, G., & Maben, J. (2017). Nursing work and sensory experiences of hospital design: A before and after qualitative study following a move to all-single room inpatient accommodation. *Health and Place*, *46*(September 2016), 121–129. https://doi.org/10.1016/j.healthplace.2017.05.001

Facility Guidelines Institute. (2006). Guidelines for design and construction of health care facilities. Retrieved from https://www.fgiguidelines.org/wp-content/uploads/2016/07/2006guidelines.pdf

Ferri, M., Zygun, D. A., Harrison, A., & Stelfox, H. T. (2015). Evidence-based design in an intensive care unit: End-user perceptions. *BMC anesthesiology*, *15*(1), 57.

Fore, A. M., & Sculli, G. L. (2013). A concept analysis of situational awareness in nursing. *Journal of Advanced Nursing*, *69*(12), 2613-2621.

Graneheim, U. H., & Lundman, B. (2004). Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. *Nurse education today*, *24*(2), 105-112.

Kourkouta, L., & Papathanasiou, I. V. (2014). Communication in nursing practice. *Materia socio-medica*, *26*(1), 65.

Krupic, F., Sköldenberg, O., Samuelsson, K., & Eisler, T. (2018). Nurses' Experience of Patient Care in Multibed Hospital Rooms: Results From In-Depth Interviews With Nurses After Further Education in Anesthesia. *Journal of peri-anesthesia nursing*, *33*(1), 78-86.

Kudchadkar, S. R., Claire Beers, M., Ascenzi, J. A., Jastaniah, E., Punjabi, N. M., Kudchadkar, B. S. R., … Punjabi, N. M. (2016). Nurses' perceptions of pediatric intensive care unit

environment and work experience after transition to single-patient rooms. *American Journal of Critical Care*, *25*(5), e98–e107. https://doi.org/10.4037/ajcc2016463

Lin, F. F., Foster, M., Chaboyer, W., & Marshall, A. (2016). Relocating an intensive care unit: an exploratory qualitative study. *Australian Critical Care*, *29*(2), 55-60.

Maben, J., Griffiths, P., Penfold, C., Simon, M., Anderson, J. E., Robert, G., … Barlow, J. (2016). One size fits all? Mixed methods evaluation of the impact of 100% single-room accommodation on staff and patient experience, safety and costs. *BMJ Quality and Safety*. 25, 241-256. https://doi.org/10.1136/bmjqs-2015-004265

Magdzinski, A., Marte, A., Boitor, M., Raboy-Thaw, J., Paré, B., & Gélinas, C. (2018). Transition to a newly constructed single patient room adult intensive care unit-clinicians' preparation and work experience. *Journal of critical care*, *48*, 426-432.

Merriam-Webster. (n.d.). Isolation. In *Merriam-Webster.com dictionary*. Retrieved March 11, 2020, from https://www.merriam-webster.com/dictionary/isolation

Merriam-Webster. (n.d.). Sight line. In *Merriam-Webster.com dictionary*. Retrieved March 11, 2020, from https://www.merriam-webster.com/dictionary/sight%20line

Mroczek, J., Mikitarian, G., Vieira, E. K., & Rotarius, T. (2005). Hospital design and staff perceptions: An exploratory analysis. *The health care manager*, *24*(3), 233-244.

Peltier, J. W., Pointer, L., & Schibrowsky, J. A. (2008). Internal marketing and the antecedents of nurse satisfaction and loyalty. *Health marketing quarterly*, *23*(4), 75-108.

Polit, D., & Beck, C. (2017). *Essentials of nursing research: Appraising evidence for nursing practice* (9th ed.). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins.

Salas, E., Cooke, N. J., & Rosen, M. A. (2008). On teams, teamwork, and team performance: Discoveries and developments. *Human factors*, *50*(3), 540-547.

Shahheidari, M., & Homer, C. (2012). Impact of the design of neonatal intensive care units on neonates, staff, and families: a systematic literature review. *The Journal of perinatal & neonatal nursing*, *26*(3), 260-266.

Shalley, C. E., & Gilson, L. L. (2004). What leaders need to know: A review of social and contextual factors that can foster or hinder creativity. *The leadership quarterly*, *15*(1), 33-53.

Stevens, D. C., Helseth, C. C., Khan, M. A., Munson, D. P., & Smith, T. J. (2010). Neonatal intensive care nursery staff perceive enhanced workplace quality with the single-family room design. *Journal of Perinatology*, *30*(5), 352–358. https://doi.org/10.1038/jp.2009.137

Swanson, J. R., Peters, C., & Lee, B. H. (2013). NICU redesign from open ward to private room: A longitudinal study of parent and staff perceptions. *Journal of Perinatology*, *33*(6), 466–469. https://doi.org/10.1038/jp.2012.157

The Canadian Medical Protective Association. (2013). Thinking ahead: The value of situational awareness. Retrieved from https://www.cmpa-acpm.ca/en/advice-publications/browse-articles/2013/thinking-ahead-the-value-of-situational-awareness.

Thorne, S. (2016). *Interpretive description: Qualitative research for applied practice*. Routledge.

Ulrich, R. S., Zimring, C., Joseph, A., Quan, X., & Choudhary, R. (2004). The role of the physical environment in the hospital of the 21st century: A once-in-a-lifetime opportunity. Concord, CA: The Center for Health Design.

Ulrich, R. S., Zimring, C., Zhu, X., DuBose, J., Seo, H. B., Choi, Y. S., ... & Joseph, A. (2008). A review of the research literature on evidence-based healthcare design. *HERD: Health Environments Research & Design Journal*, *1*(3), 61-125.

Walsh, W. F., McCullough, K. L., & White, R. D. (2006). Room for improvement: nurses perceptions of providing care in a single room newborn intensive care setting. *Advances in Neonatal Care*, *6*(5), 261-270.

Watson, J., DeLand, M., Gibbins, S., York, E. M. & Robson, K. (2014). Improvements in staff quality of work life and family satisfaction following the move to single-family room nicu design. *Advances in Neonatal Care*. *14(*2), 129-136. https://doi.org/10.1097/ANC.0000000000000046

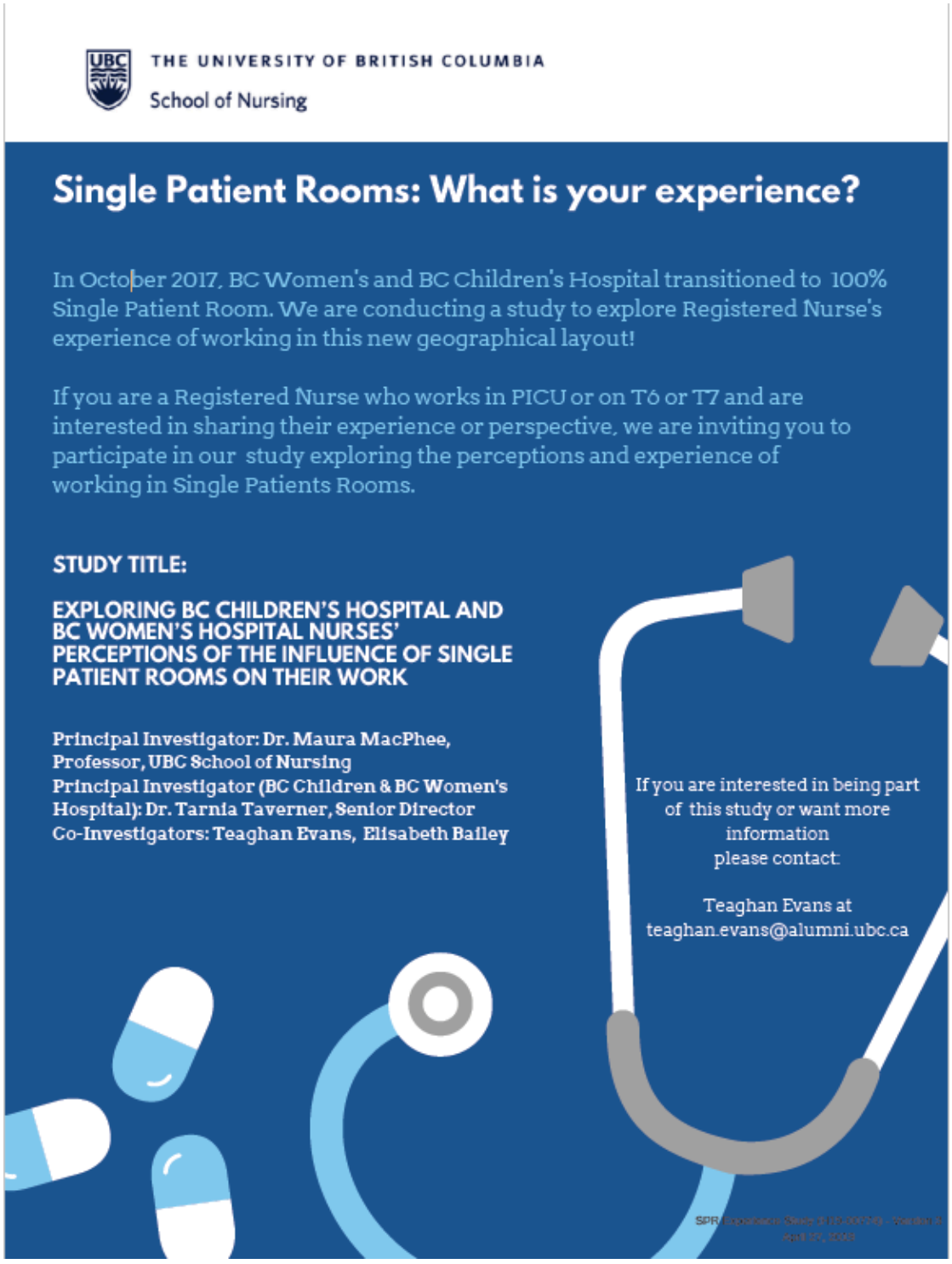
Winner-Stoltz, R., Lengerich, A., Hench, A. J., O'Malley, J., Kjelland, K., & Teal, M. (2018). Staff nurse perceptions of open-pod and single-family room NICU designs on work environment and patient care. *Advances in Neonatal Care*, *18*(3), 189-198.

Xyrichis, A., & Ream, E. (2008). Teamwork: a concept analysis. *Journal of advanced nursing*, *61*(2), 232-241.

Yildirim, B., & Ozkahraman, S. (2011). Critical thinking in nursing process and education. *International journal of humanities and social science*, *1*(13), 257-262.

Appendices

Appendix A Recruitment Poster



Appendix B Email to Recruit Participants

RE: Single Patient Room Experience Study

You are being invited to participate in a research study because we want to better understand the perceptions and experience of nurses working in single patient rooms.

The purpose of this study is to understand the experience to help provide insight into workflow changes, advantages or disadvantages of working in single patient rooms. We are looking for nurses who have either A. worked in only single patient rooms or B. have worked in single patient rooms and other geographical layouts (ex. open bay units, multi-patient rooms).

There are no known risks to participating in this study.

To thank you for your time, pizza will be provided during the focus group.

In this study, you will be asked to participate in a focus group with fellow registered nurses. You will be encouraged to talk about your experience and interact with fellow focus group participants.

Taking part in this study is entirely voluntary. You have the right to refuse to participate in this study. If you decide to take part, you may choose to pull out of the study at any time without giving a reason.

If you would like to participate, or have any questions about the study, please contact Teaghan Evans at teaghan.evans@alumni.ubc.ca