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THE EXPERIENCE OF PRACTICAL NURSING STUDENTS LEARNING IN A DETERIORATING PATIENT SIMULATION

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Dedication

Toby and Leila, this work is dedicated to you. You are my greatest joy and the reason I keep pushing forward. This thesis is a reminder that with perseverance and determination, we can accomplish our goals. My hope is that it inspires you to pursue your own dreams and reach for your goals, no matter how big they may seem. Love you.

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I feel incredibly fortunate to have been surrounded by such unwavering support throughout this research journey. This work would not have been possible without the contributions, encouragement, and guidance of many amazing individuals.

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To my husband, Dereck, thank you for believing in me. You have listened to me express my frustration and self-doubt yet your support and belief in me never wavered. I appreciate the sacrifices you and the kiddos have made so that I could spend countless hours at the computer.

Last but certainly not least, thank you to my best friend, Jill. Thank you for pushing me outside of my comfort zone but also comforting me while I'm outside that zone. What are we doing next?

Abstract

Failure to recognize and respond to clinical deterioration is a risk to patients in Canadian hospitals. While simulation literature has demonstrated benefits for baccalaureate nursing students (BN), it is important that both BN and Practical Nursing (PN) students are prepared to respond to clinical deterioration. This research examined PN students' experiences in deteriorating patient simulations using interpretative phenomenological analysis. The data demonstrated that PN students may not have the ability to recognize and respond to clinical deterioration independently. However, participants perceived that learning in a deteriorating patient simulation, although stressful, prepared them for the clinical setting. They noted that learning occurred by making connections between theory and clinical practice and through interactions with facilitators and peers. This research highlights the importance of the facilitator throughout the learning experience, and recommends further exploration of clinical translation and group learning's impact on individual performance.

Keywords: simulation, practical nursing students, clinical deterioration, experiential learning

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List of Symbols, Nomenclature, or Abbreviations

CNO	College of Nurses of Ontario
EL	Experiential learning
ELT	Experiential learning theory
FTR	Failure to rescue
GET	Group Experiential Theme
HFS	High-fidelity simulation
HSSOBP™	Health Simulation Standards of Best Practice
HIROC	Healthcare Insurance Reciprocal of Canada
PET	Personal Experiential Theme
(R/L) PN	(Registered or Licensed) Practical Nurse
RN	Registered Nurse
SBLE	Simulation-based learning experience
SP	Simulated participant/patient
VGS	Virtual Gaming Simulation

Chapter 1. Introduction

Clinical deterioration is defined as a "dynamic state experienced by a patient [which] compromises hemodynamic stability and is marked by physiological decompensation accompanied by subjective or objective findings" (Padilla & Mayo, 2018, p. 1366). Early signs of clinical deterioration are often evident 24 to 48 hours prior to acute deterioration (Smith et al., 2014). Despite this, failure to rescue (FTR) and failure to appreciate patient status changes or deterioration continues to be a risk to patients reported by Healthcare Insurance Reciprocal of Canada (HIROC, 2019; 2023) and Healthcare Excellence Canada (2023). When signs of clinical deterioration are not identified, patient harm, including death, may result. As nurses spend more time with their patients than any other healthcare professional in acute care areas (Butler et al., 2018) and are the majority of regulated healthcare providers in Canada (n= 62%; Canadian Institute for Health Information, 2022), it can be deduced that nurses are most likely to be present when early warning signs of deterioration arise.

Background

In Ontario, the College of Nurses of Ontario (CNO) is the regulatory body for Registered Nurses (RNs), Registered Practical Nurses (RPNs) and Registered Nurse Practitioners (NPs), an extended class of RN which functions in an autonomous role within the healthcare system (CNO, 2014). Although the RPN title is unique to Ontario, this role is consistent with the Licensed Practical Nursing (LPN) role in other areas of Canada and the United States. The term Practical Nurse (PN) will be used to describe both RPNs and LPNs henceforth. The key difference between the RN and PN is the length and depth of study in education (CNO, 2018). Historically, this has meant that RNs have cared for acutely unwell patients due to their ability to practice more autonomously. However, related to the expanding scope of practice for PNs, coinciding

with the RN nursing shortage in acute care areas across Canada, PNs may now be the licensed practitioner caring for more complex patients with less predictable outcomes (Canadian Institute for Health Information, 2024). It is therefore equally as important that both PNs and RNs are prepared to recognize and respond to a patient who is experiencing clinical deterioration.

Recognizing and responding to a deteriorating patient

Early warning signs of deterioration include changes in vital signs such as tachycardia, tachypnea, hypoxia, altered level of consciousness and hypo or hyperthermia which may be measured using Early Warning Signs tools (Mann et al, 2021). Nursing intuition may detect more subtle signs such as restlessness, behaviour changes, staring gaze, lethargy, or decreased verbal response (Haegdorens et al., 2023). Timely recognition of these early warning signs should prompt appropriate response to prevent further patient deterioration and possible mortality.

There are six timely interventions which should be initiated when clinical deterioration is recognized: a) call for help and stay with the patient; b) collect more information from the patient and their chart; c) position the patient appropriately based on signs and clinical presentation; d) consider oxygen therapy; e) alert any rapid response teams that may be indicated; f) provide a clear and concise handover to the care team taking over care (Australian Commission of Safety and Quality in Healthcare, 2018). An integrative literature review by Massey et al. (2016) identified several key themes which influence the nurse's ability to recognize and respond to a deteriorating patient. These themes include level of initial and ongoing education, level of support from peers and senior nursing staff, frequency of patient assessments, familiarity with the patient, and emotional intelligence. Emotional intelligence is a sense of self-awareness, self-management, social awareness, and relationship management skills believed to impact the

critical thinking and decision-making of nurses (Raghubir, 2018). Nursing students require realistic learning experiences to support them in recognizing and responding to a deteriorating patient. It is imperative that nursing students are well-prepared by educational programs to note and respond to these clinical changes. Simulation-based learning experiences (SBLEs) have the potential to meet this need.

Simulation-based learning experiences

Simulation-based learning experiences (SBLEs) are planned experiences which allow learners to practice analyzing or responding to an event in a simulated environment to help develop their knowledge, skills, or attitudes where there is little risk to the learner and no risk to the patient (Lioce et al., 2020). When aligned with best practices, SBLEs provide a psychologically safe environment for learners to practice their skills, analyze and reflect on their performances, and learn from their mistakes in a supportive learning space (Watts et al., 2021). Founded in constructivism, cognitivism, and social learning theories, SBLEs are guided by the assumptions of adult learning theory: Adult learners are self-directed, goal-based learners who use past experiences to solve problems (Knowles et al., 2005).

Statement of the Problem

The incidence of failure to respond to a deteriorating patient is not well-documented in Canada however, when ranked by cost of insurance claims, HIROC (2019; 2023) reported that failure to appreciate patient status changes was ranked number two across several practice areas. Incidence is presumably underrepresented here as it is likely that only claims for the most traumatic cases are received (Healthcare Excellence Canada, 2017). While mortality is a potential result of failing to recognize patient deterioration, requirement of a higher level of care,

longer length of stay, and psychological distress to the patient, the family, and the health care team are also likely (Healthcare Excellence Canada, 2018; Sykora et al.,2020).

New nurses are entering the Canadian healthcare field in the context of the current health and human resource crisis. Nurses are working short-staffed, caring for higher acuity or more unstable patients, working with less-experienced staff, and being redeployed to areas where the patients and staff are unfamiliar to them (McGill Nursing Collaborative for Education & Innovation in Patient-Centred Care, 2019). These factors compromise the nurses' ability to recognize and respond to a patient experiencing clinical deterioration (Massey et al., 2016). Further, Canadian nurses indicate that they do not always feel confident in their ability to recognize signs and symptoms of clinical deterioration (Vandervliet et al., 2021), and new graduate nurses in Ontario report feeling unprepared for the various challenges facing the profession (McMillan et al., 2023). When nurses are unable to recognize the early warning signs of clinical deterioration, due to systemic, environmental, and personal factors, patient harm, including death, may result (Healthcare Excellence Canada, 2018; HIROC 2019, 2023). This study seeks to understand the experience of PN students learning in a deteriorating patient simulation, to determine what impacts learning and the perceived implications to the clinical setting. Findings can be used to enhance the learning experience to improve the response to a patient experiencing deterioration in the clinical setting. Supporting PN students to recognize and respond to clinical deterioration may ultimately reduce the incidence of mortality.

Purpose and Implications

This research explores PN students' experiences of learning in a SBLE in which the patient's condition unexpectantly deteriorates. Gaining a better understanding of the students' experience of learning may be used to inform educators, simulationists, and the nursing

community of the perception of learning in a deteriorating patient simulation. A shared understanding of learning can be leveraged to influence simulation design factors to support nursing students in developing the ability to recognize and respond to a deteriorating patient. Consequentially, this has the potential to improve patient outcomes by decreasing the incidence of failure to respond to a deteriorating patient in a clinical setting.

Personal Biases to the Research

The research question which was explored in this study lent itself to qualitative research. I recognize that in qualitative research I, the researcher, become the tool that is used to *extract* data and *interpret* the results. Because of this, I committed to engaging in reflexive practice and reflected on the motivations and rationale for decision-making. To begin, it is important to consider and describe my own positionality in relation to the research.

This research is grounded in a lens of social constructivism and interpretivism. I believe that individuals develop subjective meanings of their experiences which are a product of past and often complex interactions with the world and with each other. I recognize that the meaning of an experience is interpreted within the context of that individual's world and acknowledge that *my* interpretation of *their* interpretation is also a construct of my own experiences.

As a Certified Healthcare Simulation Educator®, I have a strong understanding of the potential for simulation to provide a safe space for learners to practice high-risk scenarios in a low-risk environment. I also recognize that there are many systemic, financial, and logistical barriers that may limit human and physical resources that are required to implement simulation consistently and effectively. In addition, there are also barriers that inhibit learners from engaging with simulation consistently and effectively. However, when all factors align, I have seen the impact that simulation can have on learners.

I was inspired to gain a deeper understanding of Practical Nursing students' experiences learning in simulation based on my experience as a nurse educator using simulation. Practical nursing students at Fleming College are offered several opportunities to engage with simulation throughout the duration of their program. I have had the opportunity both to observe the students as a simulationist, and as a member of their faculty team and have noted there is a vast difference in how students engage with simulation. Some appear to be nervous; some appear to feel confident; some are very assertive, and others seem to cling to the wall. As a faculty member, I feel pride and excitement for the students when I see them excelling in a simulation. I can see them making connections between theory and practice, and hope this is transferring to the clinical setting. When I see students having trouble making decisions in a simulation, I often wonder how I could have supported them better. I know, as a faculty member, the content has been taught and reinforced. I know the students have had ample preparation time and were given content to help them succeed in the simulation. However, I still feel like I have let them down by not setting each student up for success in the simulation. As a simulationist, I find myself hoping that they are learning from the experience either way.

I am, and always have been, a self-motivated learner, committed to continued competency and personal growth. I have a positive relationship with both the educational system, and the healthcare system. I thrive in simulation-based learning experiences where I can *show what I know.* I recognize that not every learner has had the same opportunities and experience that I have and therefore understand that there are limits to what I understand about each student's experience learning in simulation. I look forward to learning from the students about their perceptions of learning in a deteriorating patient simulation.

Finally, I am both a patient of the Canadian healthcare system and a family member of patients using the healthcare system. In 2023, my dad was diagnosed with and quickly succumbed to his new diagnosis of leukemia. Unfortunately, after his first round of chemotherapy, his compromised immune system was challenged with sepsis, a systemic infection. Numerous healthcare providers overlooked his changing status and early signs of clinical deterioration. Because of this, treatment for sepsis was not initiated quickly enough and he died seventeen hours after those first signs were overlooked by the healthcare team. For the first four hours of those seventeen hours, I felt helpless. I continued to advocate and report the subtle signs of deterioration that I was noticing however those reports were unanswered until deterioration was evident. At this point, attempts at treatment were made but it was an uphill battle. Although this research was started long before my dad's death, I suppose this research has become a way to process grief and identify ways to improve nursing education to empower nurses to recognize and respond to a deteriorating patient in a timely manner.

Definition of Terms

Clinical deterioration

Clinical deterioration is a "dynamic state experienced by a patient [which] compromises hemodynamic stability and is marked by physiological decompensation accompanied by subjective or objective findings" (Padilla & Mayo, 2018, p. 1366). Early signs of clinical deterioration are often evident twenty-four to forty-eight hours prior to acute deterioration (Smith et al., 2014).

Simulation-based learning experience (SBLE)

A SBLE is a structured learning activity that portrays an actual or potential scenario that learners are likely to encounter in a real-world clinical setting (Lioce et al., 2020). SBLEs

provide an opportunity to practice, enhance, analyze, or evaluate one's ability to respond to realistic scenarios in a safe environment. SBLEs should be guided by standards of best practice and include a prebrief phase, enactment phase, and debrief phase (Watts et al., 2021).

Facilitator. A facilitator is an educator, faculty member, or simulation technician who guides the simulation. They may be involved with some or all parts of the development, implementation, enactment, or delivery of simulation activities (Lioce et al., 2020).

Debrief. Debriefing occurs following a simulation. It is a session that allows and facilitates reflection and knowledge application, typically moderated using a debriefing framework (Lioce et al., 2020).

Fidelity. Fidelity refers to the level of realism employed during a simulation. It may refer to several factors such as physical factors (the environment or equipment used) or psychological factors (emotions or beliefs; Lioce et al., 2020). A few of the modalities described in this thesis which contribute or relate to fidelity are described in Table 1.

Prebrief. A prebrief phase should be facilitated prior to a simulation experience. There are two phases to a prebrief: the preparation phase, and the briefing phase. The preparation phase involves supporting learners with the educational content necessary to enact the simulation. The briefing period is used to orient the learners to simulation, the environment, and any equipment that they may engage with during the experience (Lioce et al., 2020). An effective prebrief establishes a common mental model among the learners and the simulationists, and outlines ground rules to support psychological safety (INACSL Standards Committee et al., 2021b).

Table 1

Simulation Modalities Referenced

Modality	Definition (Lioce et al., 2020)
High-fidelity simulation (HFS)	Simulation experiences that are extremely realistic and provide a high level of interactivity and realism for the learner.
Immersive simulation	A real-life situation that deeply involves the participants' senses, emotions, thinking, and behavior; creating an immersive simulation depends on the alignment with learning objectives, the fidelity of the simulation (physical, conceptual, and emotional), and participant´s perception of realism.
Low fidelity simulation	Simulations not needing to be controlled or programmed externally by simulationists.
Manikin-based simulation	The use of manikins to represent a patient using heart and lung sounds, palpable pulses, voice interaction, movement (e.g., seizures, eye blinking), bleeding, and other human capabilities that may be controlled by a simulationist using computers and software.
Screen-based simulation	A computer-generated video game simulator that can create scenarios that require real-time decision-making.
Simulated participant/ standardized patient (SP)	A person who portrays a patient (simulated patient), family member, or health care provider in order to meet the objectives of the simulation; a simulated person may also be referred to as a standardized patient/family/health care provider if they have been formally trained to act as real patients in order to simulate a set of symptoms or problems used for health care education, evaluation, and research. Simulated persons often engage in assessment by providing feedback to the learner
Virtual gaming simulations (VGS)	Simulations of real-world events or processes designed using gamification for solving a problem.

Note. Definitions developed by Lioce et al. (2020).

Psychological safety. Psychological safety refers to the feeling or perception that the environment is a safe space to learn from mistakes, take risks, and ask questions (Lioce et al., 2020). Establishing psychological safety is associated with improved learning outcomes and learner satisfaction (Watts et al., 2021).

Chapter Summary

Failure to recognize, rescue, or respond to deterioration continues to be a risk to patients in Canadian hospitals. It is important that both PN and RN students are prepared by educational institutions to recognize and respond to a deteriorating patient. Simulation-based learning experiences (SBLE) may fulfill this need. This research explored PN students' experiences of learning in a deteriorating patient simulation. The purpose was to create a shared and detailed understanding of what impacts learning, and the perceived implication to the clinical setting. This information will inform simulation design to optimize learning and potentially decrease the incidence of failure to respond to a deteriorating patient in a clinical setting, thereby improving patient outcomes.

Chapter 2. Review of the Literature

In preparation for this research study, a review of the literature was conducted to determine what is known from the literature about deteriorating patient simulations. This chapter describes what was discovered in this literature review. First, an overview of experiential learning theory and simulation is described. Then, the literature review methodology is explained, and the results of the literature review are summarized.

Theoretical Frameworks

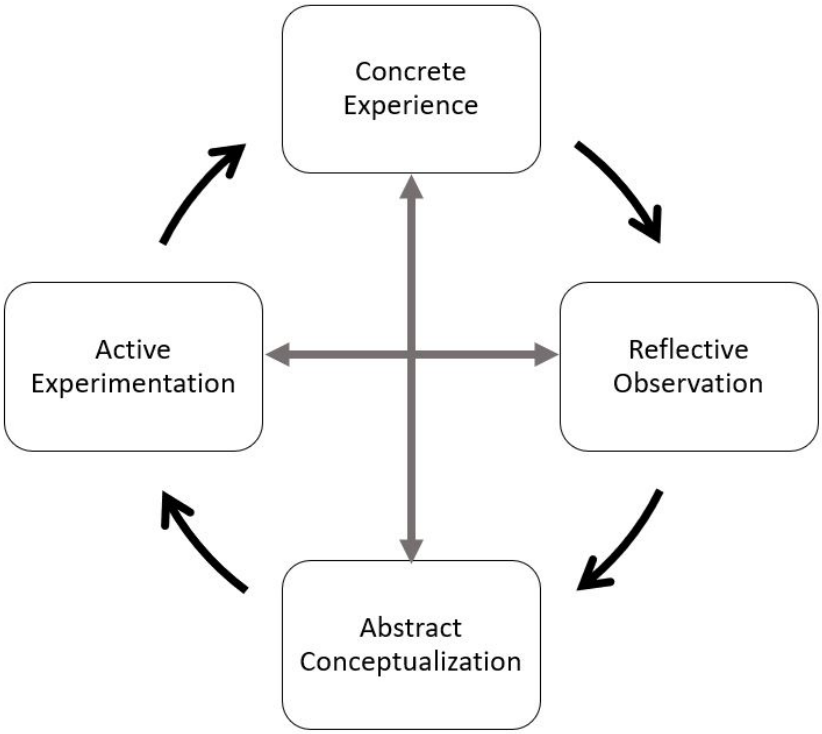
Two key frameworks were important to the literature review and inherently to the research project henceforth. Firstly, understanding Experiential Learning Theory aids the reader in understanding the purpose for the approach to SBLEs. Secondly, the National League for Nurses (NLN)/Jeffries Simulation Framework describes the results of the literature review and is briefly discussed.

Experiential Learning Theory

Simulation-based learning experiences are typically founded in Experiential Learning (EL). EL is pedagogical praxis which values space for reflecting on and analyzing an experience to create knowledge. Philosophers Aristotle and Plato first discussed key concepts of EL theories such as reflecting on learning which form the foundation of many EL theories (ELTs) to date. ELT is grounded in experience and the learning process that accompanies the experience. The product of EL is the knowledge gained by intentionally engaging in this process (Kolb & Lewis, 1984). Kolb (1984) describes this learning process as a sequence of four phases illustrated in Figure 1: concrete experience (CE), reflective observation (RO), abstract conceptualization (AC), and active experimentation (AE). These phases are often simplified to feeling (CE), watching (RO), thinking (AC) and doing (AE).

Figure 1

Kolb's Experiential Learning Theory



Note. Adapted from Kolb and Lewis (1984).

his four-phase model draws on Lewin's Experiential Learning Model (1951) and Dewey's Model of Learning (1938, as cited in Kolb, 1984). Dewey's Model of Learning illustrates the relationship between experience and learning, encouraging a purposeful pause instead of acting on impulse during an experience. This pause allows time to apply knowledge and judgement to employ a more purposeful reaction or response. The Lewinian model encourages exploring personal experience of a *here and now* experience, making observations, gathering feedback to the experience, and applying the product of this information-gathering to future experiences. Lewin believed that an imbalance in information-gathering and action resulted in organizational dysfunction (1951, as cited in Kolb, 1984).

Jean Piaget's work on cognitive development further influenced Kolb's understanding of these dual tensions within the experiential learning models (1978, as cited in Kolb, 1984). Piaget believed learning to be a balance between accommodation (processing the experiences we endure) and assimilation (experiencing the world using the knowledge we have processed). Within Kolb's EL Model (Figure 1), this need for balance is represented as two continuums: the CE:AC continuum, the continuum which spans from engaging with the actual experience to analyzing how this experience aligns with current conceptual frames of reference to help the learner *grasp the experience*; and the RO:AE continuum, the continuum which spans from reflecting on the experience to applying or planning to apply new knowledge to similar situations to help the learner *transform the experience.*

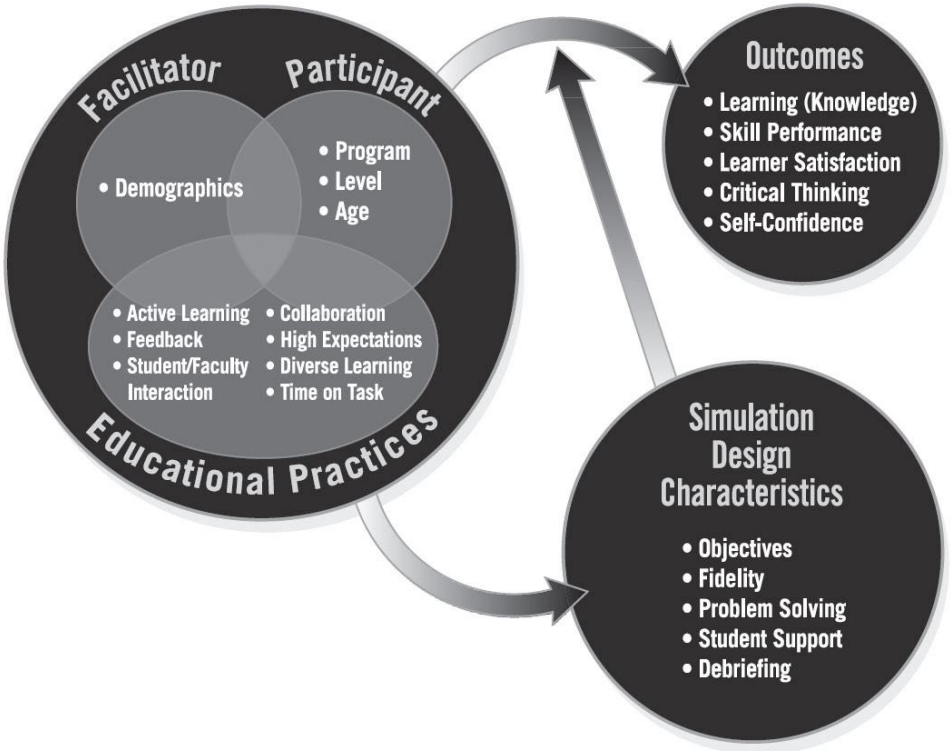
NLN/Jeffries Simulation Framework

Strong educational practices form the foundation of simulation and consider the learner's program, level or ability, and age (Jeffries, 2020). The educational plan should include collaboration, active learning, clarification of roles, and appropriate support for the learner. The simulation design should consider the intended outcomes and both facilitator and learner factors when incorporating fidelity (realism), level of support, debriefing structure, and performance expectations.

Jeffries' framework illustrates the connection between educational practices, learning outcomes, and simulation design (Jeffries, 2020; Figure 2). Outcomes which can be achieved or measured using simulation, according to Jeffries, include knowledge, skill performance, learner satisfaction, critical thinking, and self-confidence. This framework was employed to organize data from the literature review to describe what is known from the use of deteriorating patient simulations in nursing education.

Figure 2

NLN/Jeffries Simulation Framework



The Scoping Literature Review

A modified scoping review of the literature determined what is known about the use of deteriorating patient simulations in nursing education. Peer-reviewed journal articles and articles published as open educational resources were assessed for eligibility. Eligible articles were analyzed to identify which learning outcomes have been demonstrated using deteriorating patient simulations, and to consider how simulation can be leveraged to support nursing students, particularly Practical Nursing students, in recognizing and responding to a deteriorating patient. Although not an essential component of scoping reviews, the learning outcomes were extracted and analyzed using the NLN/Jeffries Simulation Framework to evaluate the strengths and gaps in learning outcomes. A scoping review methodology identified gaps in the literature which were used to inform the research question and design.

Review Questions

The primary question that guided this scoping review was: What is known from the literature about the use of deteriorating patient simulations and its impact on nursing students in nursing education? The secondary questions were: a) What learning outcomes have been demonstrated using deteriorating patient simulations in nursing student education? and b) What learning outcomes have been demonstrated using deteriorating patient simulations in PN education? As recommended by the Joanna Briggs Institute's (JBI) Manual for Evidence Synthesis (Peters et al., 2020), the Population, Concept, Context mnemonic guided the review question and therefore the inclusion and exclusion criteria for this scoping review. The inclusion and exclusion criteria are listed in Table 2.

Table 2

Inclusion and Exclusion Criteria

	Inclusion Criteria	Exclusion Criteria
Population: Nursing Students	Practical nursing student* OR nursing student* OR undergraduate nurse* OR nurs* education.	NOT graduate level nursing student* OR Nurse Practitioner student* OR Registered Nurse
Concept: Deteriorating Patient Simulation(s)	Simulation-based education OR simulation AND deteriorating patient OR patient deterioration OR early warning signs.	NOT virtual reality OR interprofessional simulation OR multi-disciplinary simulation
Context: Nursing education	Peer-reviewed, scholarly articles published in English language.	No exclusions on geographical location. Limit articles to 2013-present.

Note. Inclusion and exclusion criteria for this literature review were determined using the Population, Concept, Context format.

A preliminary search identified any pre-existing scoping reviews related to this topic. In a scoping review by Gillan et al. (2022) related to nursing students and the deteriorating patient simulation, findings centralized around simulation modality factors which affected nursing students' ability to recognize and respond to a deteriorating patient. Gillan concluded that nursing students lacked situational awareness and distracting simulation modalities influenced the ability to recognize and respond to a deteriorating patient, however repetitive exposure was thought to improve performance. The details of Gillan et al.'s scoping review intended to inform the design of prospective studies, whereas the intention of this literature review was to identify outcomes associated with deteriorating patient simulations to determine whether they are associated with improved response to clinical deterioration.

Population: Nursing students

In Ontario, Canada, there are currently three levels of nursing education: a) Registered Nurse Practitioner (NP) which is a Registered Nurse with an advanced university degree to support a broad and independent scope of practice; b) Registered Nurse (RN) which, as of 2005, requires a four-year Bachelor of Science in Nursing degree; and c) Registered Practical Nurse (RPN) which, as of 2005, requires a two-year college level diploma (Registered Nurses Association of Ontario, n.d.) While the initial intention of this scoping review was to determine how SBLE supports PN students in recognizing and responding to a deteriorating patient, there is a significant gap in literature related to PN students and simulation. The population was therefore expanded to include: Licensed Practical Nursing (LPN) students, college-level nursing students in provinces and territories outside of Ontario and many states in the United States of America (National Nursing Assessment Service, 2023); Licensed Vocational Nursing (LVN) students, college-level nursing students in the state of California (California Government, n.d.); Enrolled

Nursing students, vocational-level nursing students in Australia; Associate Degree Nursing students, a degree program in the United States which typically takes two to three years to complete and often requires prerequisite college courses; and Bachelor of Science in Nursing students and undergraduate nursing students, both university-level nursing students planning to certify as a Registered Nurse. The search terms were expanded to include *practical nursing student* OR nursing student* OR undergraduate nurse* OR nurs* education.* Graduate level nursing students, Nurse Practitioner students and Registered Nurses were excluded.

Concept: Deteriorating patient simulations

Clinical deterioration is a "dynamic state experienced by a patient [which] compromises hemodynamic stability and is marked by physiological decompensation accompanied by subjective or objective findings" (Padilla & Mayo, 2018, p. 1366). Deteriorating patient simulations was the reviewed concept. This included simulations in which the learning outcomes address the recognition and response to a deteriorating patient, also referred to as patient deterioration or early warning signs of deterioration. Search terms used were *simulation-based education OR simulation AND deteriorating patient OR patient deterioration OR early warning signs.* Simulation modalities included are: a) high-fidelity simulation (HFS), a simulation in which the interactivity and level of realism is high for learners; b) immersive simulation, a simulation which has a high level of physical, conceptual, and emotional fidelity, and deeply involves many of the learners' senses, including emotions, thinking and behaviour; c) low-fidelity simulation (LFS), a simulation which does not require external programming and may include activities such as case studies, task-trainers, or role-playing; d) manikin-based simulation, a simulation using a manikin to portray a patient or participant; e) simulation with a simulated participant or patient (SP), a human-based simulation in which an actor plays the role

of a patient or participant; f) screen-based simulation, serious games, or virtual simulation which are simulations developed on a computer platform. Concepts excluded were virtual reality, and interprofessional or multi-disciplinary simulation. Virtual reality was excluded due to the limitations such as cybersickness, accessibility issues, and technical limitations (Hamad & Jia, 2022). In addition, the institution at which the research took place did not have the ability to implement virtual reality at the time of this research. Interprofessional and multi-disciplinary simulation was excluded because, while valuable, it does not focus exclusively on nursing education, and it is difficult to differentiate whether results are attributed to interprofessional education or the deteriorating patient simulation.

Context: Current nursing education

Recognizing that simulation research in Canada related to deteriorating patient simulations is limited, the search was expanded to include worldwide research, published in the English language within the last ten years. When studies from outside of Canada were reviewed, educational requirements were examined and clarified to determine how the level of learners may compare to Canadian nursing students. The literature search was limited to the last ten years recognizing the evolution of simulation, simulation-technology, and the expanding role of the Practical Nurse. Some of the literature referenced however, may exceed ten years if its contents were deemed to be relevant and foundational in nature.

Method

Scoping review methodology was selected as the intention of this review to gain a better understanding of what is known about the use of deteriorating patient simulations in nursing education. As a newer branch of evidence-synthesis, scoping review methodology continues to evolve. This scoping review was conducted in accordance with JBI methodology as the approach

is prescriptive and stepwise which supports novice researchers (Peters et al., 2020). The search strategy included qualitative, quantitative and mixed-methods journal articles. Journal articles were limited to include only peer-reviewed, full-text articles available in the English language. Systematic analyses, meta-analyses, and related scoping reviews were also considered for inclusion in this scoping review.

An initial search of EBSCO Discovery Search available through the Athabasca University library was conducted to determine key search terms on which to base the full search strategy. These search terms were then used to search the Cumulated Index to Nursing and Allied Health Literature (CINAHL), ProQuest Nursing and Allied Health Premium, and Gale One File Health and Medicine. Google Scholar was also searched, and the first sixty articles were screened. At this point, literature was no longer deemed relevant. The public websites for INACSL, SSH, and the Clinical Simulation in Nursing Journal were also searched for relevant literature. The reference lists from discovered articles were also screened for additional relevant articles.

Evidence selection

Discovered articles were downloaded into Zotero Citation Management Tool. Duplicates were merged and the titles and topic were screened for relevance. Relevant articles were then screened by title and abstract and removed or sought for retrieval based on the inclusion and exclusion criteria. Full text of these articles was reviewed and analysed for inclusion criteria. When resources were excluded, the reason for exclusion was described. The results of the search and study inclusion process are reported in full and presented in a Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Review (PRISMA-ScR) flow diagram as shown in Figure 3 (Page et al., 2020; Tricco et al., 2018). In total, 363 articles were

found in the previously described databases. 29 duplicate articles were identified using Zotero and 206 records were removed based on their title, keywords, and relevance. The remaining 128 records were reviewed by title and abstract. Based on inclusion/exclusion criteria, 75 records were excluded. Full text reports were sought for the remaining 53 articles; two were not found. The 51 remaining articles were reviewed in full and 32 articles were excluded for the following reasons: a) the participants were not nursing students (n=7); b) the simulation scenario was not a deteriorating patient (n=14); c) the simulation was only part of a larger intervention and therefore could not be isolated as the main reason for outcomes achieved (n=4); d) the article focused on the validity of an assessment tool which is beyond the scope of this scoping literature review (n=2); 5) the article proposed a new debriefing tool (n=1); 6) the articles were not scholarly (n=4). In the end, 19 journal articles were included in the scoping literature review.

Data extraction

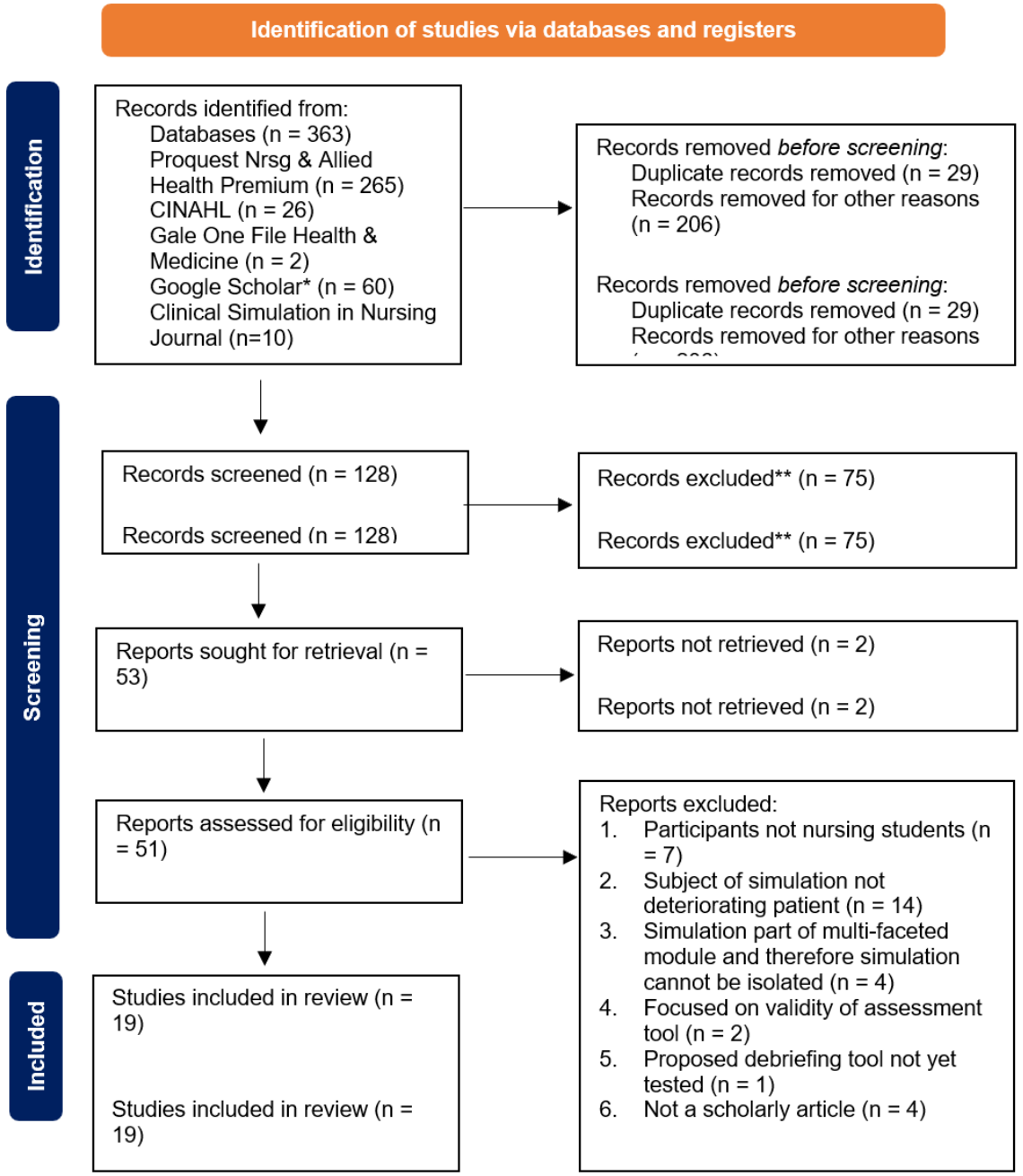
A data extraction table was created to extract details from the evidence related to the population and context, study design, simulation method, outcome and measurements, results and key findings. The completed data extraction table is mapped and featured in Appendix A.

Results

From the nineteen selected studies, ten articles used quantitative methodology, five used strictly qualitative methodology, and four used mixed methodology to measure outcomes. Six studies took place in Australia, four in Canada, three in the United Kingdom, two in United States, two in Singapore, one in China, one in Malta, one in Saudi Arabia, and one in France. Note that one study took place over four different countries hence the variation in numbers listed compared to journal articles reviewed. The articles were published between 2014 and 2022. Cumulatively, 1655 nursing students were involved in the studies reviewed. This included

Figure 3

PRISMA-ScR Flow Diagram



*Scanned first 60 articles of results of Google Scholar search until it was evident that article search results were no longer relevant
**Records excluded based on title/abstract.

primarily university-level nursing students (n=1638). Enrolled nursing students, which are diploma-trained nursing students, were only included as participants in one study (Kelly et al., 2014; n=17). Of the university-level nursing student participants, the majority were upper-level students (students in their third or fourth year; n=1171), and the rest were in first or second year (n=467). No eligible studies included practical nursing students, associate degree nursing students, or vocational nursing students as participants.

Most of the deteriorating patient simulations were high-fidelity simulations (HFS) using a manikin (n=11) or HFS with a simulated participant (SP; n=4). One study compared HFS with a manikin to HFS with a SP (Ignacio et al., 2015). One study compared HFS with a manikin to virtual simulation (Liaw et al., 2014). One study incorporated both HFS and virtual simulation (Goldsworthy et al., 2019); and one study used only virtual simulation (Goldsworthy et al., 2022).

Measured outcomes

The NLN/Jeffries Simulation Framework delineates measurable simulation outcomes into three core categories: participant outcomes, patient outcomes, and system outcomes. Participant outcomes were categorized using the thematic headings: knowledge, skill performance, learner satisfaction, critical thinking, and self-confidence. The results of the data extracted through the scoping literature review will be discussed using these categories. Table 3 summarizes the outcomes demonstrated in many of the studies (n=16). It should be noted that not all studies could be classified into the aforementioned categories but will be discussed amongst the measured outcomes.

Table 3

Summary of Measurable Outcomes

Outcome	Journal Article													
	Bashaw et al (2016)	Chadwick & Withnall (2016)	Dix et al. (2021)	Goldsworthy et al. (2019)	Goldsworthy et al. (2022)	Hart et al. (2014)	Ignacio et al. (2015)	Kelly et al (2014)	Liaw et al. (2014)	Liu et al. (2021)	Lucktar-Flude et al. (2015)	Merrimen et al. (2014)	Sapiano et al. (2018)	Small et al. (2018)	Staynt et al. (2015)
Knowledge	N/A	N/A	N/A	✓	✓	N/A	✓	N/A	N/A	N/A	✓	✓	✓	N/A	✓
Skills Performance	N/A	N/A	N/A	N/A	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A	N/A	✓
Learner Satisfaction	✓	N/A	N/A	N/A	N/A	N/A	N/A	N/A	✓	✓	✓	✓	N/A	N/A	✓
Critical Thinking	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	✓	N/A
Self-Confidence and Self-Efficacy	N/A	✓	✓	✓	✓	N/A	✓	✓	N/A	✓	✓	✓	N/A	✓	N/A

Note. The table illustrates participant outcomes demonstrated in each study using a ✓.

N/A means the outcome was not assessed.

No studies were found which measured patient or system outcomes, however one study (Ignacio et al., 2015) did ask students about knowledge transfer to the clinical setting. In these mixed methods randomized controlled trial, nursing students felt that HFS with an SP prepared them with the emotional intelligence to manage the stress of recognizing and responding to a deteriorating patient in the clinical setting.

Knowledge

Knowledge gained was often measured using pre- and post-test design. Four studies used a pre- and post-simulation multiple choice test to determine whether knowledge was gained through deteriorating patient simulations. Three studies found that post-simulation knowledge test scores were higher than pre-simulation test scores indicating that knowledge was gained with simulation (Goldsworthy et al., 2022; Liaw et al., 2014; Sapiano et al., 2018) The fourth study found that knowledge in some areas (deterioration related to myocardial infarction, septic shock, and asthma) improved, while knowledge in other areas (deterioration related to seizure and cardiac arrest) remained the same (Goldsworthy et al., 2019).

Seven studies used a pre- and post- intervention objective structured clinical examination (OSCE) to ascertain whether knowledge was gained following a SBLE. Two studies which used in-person simulations with either a high-fidelity manikin (n=2) or a medium-fidelity manikin (n=1) saw an increase in performance when comparing pre- and post-test OSCE scores (Merrimen et al., 2014; Staynt et al., 2015). Lucktar-Flude et al. (2015) found that, with repetitive exposure to deteriorating patient simulations, knowledge scores and behaviour in the simulations improved.

Ignacio et al. (2015) compared HFS with a manikin and immersive simulation with a trained SP and found that there is no significant difference in the knowledge gained when comparing the two modalities. Liaw et al. (2014) compared HFS versus virtual patient simulation. While performance scores completed one to two days post-intervention increased significantly for the virtual patient student learners, at the two-and-a-half-month mark, OSCE performance results decreased significantly for the virtual group and remained relatively the

same for the HFS group. This study suggests that, while performance was improved using both the HFS and the virtual patient simulation, it may be retained longer when HFS is used.

Skill performance

Skill performance was measured using a variety of checklists, questionnaires or OSCEs as mentioned above. In general, pre- test OSCEs and skills checklists such as the Situation Awareness Global Assessment Technique (SAGAT; Endsley, 1988), Team Emergency Assessment Measure (TEAM; Cooper et al., 2010), and the Emergency Response Performance Tool (Arnold et al., 2009), found that student nurses may not have the foundational knowledge to recognize and respond to a deteriorating patient (Bogossian et al., 2014; Hart et al., 2014; Lucktar-Flude et al., 2015; McKenna et al., 2014). However, skill performance did improve with repeated exposure (Hart et al.; Lucktar-Flude et al.).

In a discourse analysis study, Mohammed (2020) identified that lack of teamwork skills, lack of understanding of nursing role and difficulty communicating with the deteriorating patient was evident upon detailed analysis of the recorded simulation. Despite the notable underperformance, Liu et al. (2021) found that students who received simulation training paired with virtual case studies and group pre-discussion, performed better than students who received lecture-style learning and simulation. This indicates that instructors who facilitated a community of inquiry prior to simulation may enhance learning. Repetition (Lucktar-Flude et al., 2015; Sapiano et al., 2018) and cuing via an earpiece when students were underperforming (Chapelain et al., 2015) was also found to improve skill performance.

Learner satisfaction

Nursing students reported a high degree of learner satisfaction when deteriorating patient simulations were employed. This was captured quantitatively using surveys and was a common

theme in the qualitative studies (Bashaw et al., 2016; Merriman et al., 2014; Liaw et al., 2014; Lucktar-Flude et al., 2015; Staynt et al., 2015). When compared to didactic lecture-style delivery of content, simulation was preferred (Merriman et al., 2014; Staynt et al., 2015). Fidelity was noted to contribute to learner satisfaction and, while a manikin or SP can both be effective, the modality chosen should strive to create the highest level of realism possible (Ignacio et al., 2015; Small et al., 2018).

Critical thinking

No specific measures of critical thinking were employed in the studies reviewed. However, in a phenomenological research study, Small et al. (2018) found that deteriorating patient simulations helped students develop the ability to combine the art and science of nursing which could represent the overlap of creative and critical thinking that is required in nursing. Bucknall et al. (2016) explored the decision types made during deteriorating patient simulations. Decisions related to patient assessment, information gathering, diagnosis, interventions, planning, collaboration, and communication were influenced by patient characteristics, individual and team knowledge, and the context of the situation.

Self-confidence and self-efficacy

Self-confidence and self-efficacy were commonly measured outcomes in the literature reviewed. Students felt that their ability to recognize and respond to a deteriorating patient after participating in the simulations improved as demonstrated by increased self-efficacy questionnaire scores (Goldsworthy et al., 2022; Goldsworthy et al., 2019; Merriman et al., 2014). Students' perceived self-confidence using Likert scale questionnaires improved after participating in deteriorating patient simulations (Chadwick & Withnall, 2016; Lucktar-Flude et al., 2015). This was consistent with data reported in focus group discussions (Goldsworthy et al.,

2022). Final year nursing students described feeling confident that they were prepared to recognize and respond to a deteriorating patient in clinical practice (Dix et al., 2021) and felt more confident communicating with members of the interprofessional team when responding to a deteriorating patient (Kelly et al., 2014). In a separate focus group study (Ignacio et al., 2015), third year nursing students (n=57) reflected on the impact that simulation had on their performance in clinical practice, specifically when they encountered a deteriorating patient. Students felt that the stress experienced during deteriorating patient simulations helped them to attain the emotional intelligence to recognize and respond to a deteriorating patient in clinical practice without feeling the physical effects of stress in the moment.

Discussion of the Literature Review

When simulation evaluated nursing students' performance, it was noted that students may not have the foundational knowledge to recognize and respond to a deteriorating patient (Bogossian et al., 2014; Lucktar-Flude et al., 2015; McKenna et al., 2014; Mohammed, 2020). This is consistent with concerns about failure to recognize expressed by the Australian Commission on Safety and Quality in Health Care (2021) HIROC (2023), and Healthcare Excellence Canada (2018). Immediate action is required to support nursing students in feeling prepared to recognize and respond to deteriorating patients in the clinical environment.

This scoping review revealed that SBLEs may support nursing students in recognizing and responding to a deteriorating patient. Several benefits in nursing education were noted: a) Increased knowledge (Goldsworthy et al., 2022; Liaw et al., 2014; Sapiano et al., 2018) and skills performance (Hart et al., 2014; Ignacio et al., 2015; Liaw et al., 2014; Lucktar-Flude et al., 2015; McKenna et al., 2014, Merriman et al., 2014; Sapiano et al., 2018; Staynt et al, 2015); b) High levels of learner satisfaction (Bashaw et al., 2016; Merriman et al., 2014; Liaw et al., 2014;

Lucktar-Flude et al., 2015; Staynt et al, 2015); and c) Increased self-confidence and self-efficacy (Chadwick & Withnall, 2016; Dix et al., 2021; Goldsworthy et al., 2022; Goldsworthy et al., 2019; Liu et al., 2021; Lucktar-Flude et al., 2015; Merriman et al., 2014). Regardless of modality (i.e. manikin-based, SP-based, immersive, or virtual), fidelity contributed to positive outcomes (Bashaw et al., 2016; Chadwick & Withnall, 2016; Ignacio et al., 2015; Liaw et al., 2014; Mohammed, 2020). Active faculty involvement such as cueing via an earpiece (Chapelain et al., 2015; Mohammed, 2020), preparation with a community of learners (Liu et al., 2021) or preparation with virtual simulation (Goldsworthy et al., 2019; Goldsworthy et al., 2022; Sapiano et al., 2018) may further enhance these positive outcomes. The knowledge level of the learners should be considered in all aspects of simulation planning.

Identified Gap: Population

Most of the participants in the included articles were upper-level university nursing students. Only one study included Enrolled Nursing students in Australia (which is the equivalent to Practical Nursing students in Canada) and one study included second semester Bachelor of Science in Nursing (BScN) students. Although both Kelly et al. (2014) and Lucktar-Flude et al. (2015) concluded that deteriorating patient simulations were beneficial for all levels of nursing students, due to the small sample sizes and limited number of studies, further research related to Practical Nursing students and deteriorating patient simulations is indicated.

Identified Gap: Patient and System Outcomes

Knowledge transfer to the clinical environment, including patient and system outcomes was also a gap in the literature. Only one study (Small et al., 2014) explored whether deteriorating patient simulations supported students when later faced with a deteriorating patient in clinical practice. While the study was well-designed, the sample size was a small group (n=12)

of BScN university nursing students and therefore not be generalized to Practical Nursing students in Canada.

Research Question

Based on the gaps identified in this scoping literature review, a research plan was developed to explore, describe, then discuss PN students' experience of learning in a deteriorating patient simulation. Research was guided by the research question *What is the experience of PN students learning in a deteriorating patient simulation?* Secondary questions included: a) W*hat impacts the experience of learning in a deteriorating patient simulation?* b) *What are the perceived implications to clinical practice?* Interpretative phenomenological analysis gave voice to each participant as they made sense of their individual experience learning in a deteriorating patient simulation.

Chapter Summary

This literature review has identified that, while nursing students lacked the foundational knowledge necessary to recognize and respond to a deteriorating patient, simulation has a high-level of learner satisfaction and is an effective pedagogy to develop the knowledge, skills, confidence, and self-efficacy to support learners in readiness to practice. While these outcomes have been demonstrated in university-level nursing students in the simulation environment, it is unknown if deteriorating patient simulations support Practical Nursing students in recognizing and responding to a deteriorating patient. It is also undetermined if simulation results in improved recognition and response to a deteriorating patient in the clinical setting. Interpretative phenomenological analysis provided a deeper understanding of Practical Nursing students' experience of learning in a deteriorating patient simulation.

Chapter 3. Methodology

A methodical approach to planning this study was taken to support transparency, trustworthiness, and rigour in the research. As a novice researcher, I referred to Interpretative Phenomenological Analysis (IPA) researchers Smith, Flowers, and Larkin (2022), as well as Boden and Eatough (2014) to design the research. Reflexive journaling occurred in conjunction with the design of the research project to document, describe, and explain decisions made in the process supporting rigour and trustworthiness. This chapter begins by exploring the theoretical underpinnings of IPA to situate the study within the research paradigm. The rationale for its use in simulation-based research is discussed, and a detailed overview of the sample, design, data collection process and approach to analysis is provided.

Interpretative Phenomenological Analysis

IPA is an approach to qualitative research that seeks to gain an in-depth understanding of the way an individual makes sense or meaning of a phenomenon or experience (Smith et al., 2022; Noon, 2018). It is not solely about understanding the experience in isolation but about analyzing and understanding the way the participant analyses and makes sense of their experience (Smith et al.). In IPA research, “the participant becomes the universe of exploration” (Coxin & Smith, 2021, para. 1). The researcher takes on the role of supporting the participant in reflecting on or exploring their experience, while simultaneously interpreting the participant’s account to better understand the experience. While other participants may have a similar experience, *how* they perceive, interpret, or make sense of the experience may be vastly different (Smith et al.).

Theoretical Underpinnings

Drawing on ideas from phenomenology and symbolic interactionism, IPA was first articulated in the 1990's by Jonathan Smith as an approach to understanding the psychology of an experience in the clinical context (Smith & Fieldsend, 2021). Smith proposed a qualitative approach grounded in phenomenology to conduct health psychology research, arguing that "psychology was, could and should be both experimental and experiential" (Smith, 1996, p. 264). He proposed that an IPA study could provide a more in depth understanding of an experience or condition previously examined only through quantitative methods (Smith, 1996). Since its inception in health psychology, IPA has since been employed around the world in clinical and counselling research, social psychology, and education research (Smith et al., 2022). IPA is grounded in three theoretical underpinnings: Phenomenology, hermeneutics, and idiography (Smith, 2017). To understand the methodology, it is best to first describe the theoretical foundations that guide the approach.

Phenomenology. Philosophical assumptions of phenomenology vary widely however Smith grounds his work in the phenomenology described by philosophers Husserl, Heidegger, Merleau-Ponty, and Sartre (Smith et al., 2022). IPA focuses on an experience, and the participant's perception of that experience. It recognizes that an experience is never pure. It does not happen in isolation and is a construct of the participant's world "of objects and relationships, language and culture, projects and concerns" (Smith et al., 2022, p. 16). Experiences are embedded in a participant's world, and the participant's world is embedded in the perception of their experiences. The researcher becomes the central tool to analyze and interpret the complex meaning that is entangled in the experience.

Hermeneutics. Hermeneutics refers to the theory of interpretation and, as previously

mentioned, interpretation is a significant component of IPA (Smith et al., 2022). Hermeneutics aims to gain a deeper understanding of the meaning of text by exploring the context in which the text is embedded. Gadamar, a hermeneutics theorist and writer, describes the interpreter's role in seeing through the fore-meaning, the meaning presenting itself first, to discover the new interpretation (1990 [1960]):

> A person trying to understand something will not resign himself from the start to relying on his own accidental fore-meanings, ignoring as consistently and stubbornly as possible the actual meaning of the text until the latter becomes so persistently audible that it breaks through what the interpreter imagines it to be. Rather, a person trying to understand a text is prepared for it to tell him something (p. 269).

To effectively interpret meaning within the exploration of an experience, the IPA researcher uses reflexivity to identify within which assumptions their interpretations are grounded. They must be aware of their own biases and how those biases may influence their interpretation of the text. By identifying the fore-meaning and the researcher's inevitable preconceptions, the "new" meaning becomes more evident and therefore easier to extract (Smith et al, 2022). The process of reflexivity in IPA research is more than simply noting one's thoughts during data analysis, it is about using imagination, reflective and critical thinking to determine the interplay between our own interpretations and the participants' intentions to determine the meaning of an experience, constructed by both the participant and the researcher (Smith et al, 2009).

Engward and Goldspink describe the process of double hermeneutics as becoming "lodgers in the house" of the participant (2019), inspired by a diary entry by Engward:

> The words are rattling in the transcripts, stories of what it is like 'to be' are enveloped in the pages. I've heard the words once during the interviews but now, on the page the

> words beckon me to venture in. I'm beginning my immersion, but I'm apprehensive because I'm not sure what it really means, how long it will take or where this analytic adventure will take me (p. 1).

Reflexivity in IPA research is imperative to the process of interpretation. It is described as a grueling and lengthy process that, when implemented effectively, supports rigour and credibility in data analysis through transparency and trustworthiness (Engward & Goldspink, 2019; Smith et al., 2022).

Idiography. Idiography focuses on understanding individual experiences in depth from that individual's perspective, rather than focusing on how a group of individuals interpret an experience in general (Smith et al., 2022). While critics of case study research would argue that seeking to understand a singular case limits generalizability (Hammersley et al, 2000), Smith et al. defend that IPA's commitment to single case analysis allows the single case to be more deeply understood which, in turn, leads to a more rigorous approach to generalization. This is supported by the statistician Francis Galton (1883, in Allport, 1951):

> Acquaintance with particulars is the beginning of all knowledge – scientific or otherwise – starting too soon with analysis and classification, we run the risk of tearing mental life into fragments and beginning with false cleavages that misrepresent the salient organizations and natural integrations in personal life (p. 56).

As previously discussed, related to hermeneutics, the level of reflexivity required by the researcher to truly "live" in the world of the participant is immensely time-consuming, methodical, and involved (Engward & Goldspink, 2020). By immersing oneself in a singular case before moving into the next participant's "world", the researcher decreases the risk of transference from one participant's experience to another (Engward & Goldspink).

Rationale

IPA was chosen as the appropriate methodology for this research question given that it allows the researcher to explore and understand individual experiences in depth. I believe that each individual's experience is unique to them; a construct of one's social, cognitive, and emotional ways of knowing; of past and of current events and reflection on those events. I believe that, when trying to understand the meaning of an experience the only person who truly *knows* the meaning of their individual experience is that individual participant themselves. The researcher can be employed as a tool to help make sense of the experience based on the individual's ways of understanding the experience.

Historically, IPA has been employed in psychology research, as well as healthcare research to enrich the understanding of the lived experience of both healthcare professionals and patients (Peat et al., 2018; Smith, 1996). It has also been used in education research to gain a deeper understanding of the lived experience within the educational system (Noon, 2018). Noon purports that IPA is an appropriate methodology to be used in education research given that *experience* is a key component in both instructors' and students' perception of learning within the education system. IPA's inductive approach to questioning often leads to elicitation of new perspectives and ideas and given the flexibility of IPA, it may be a more accessible approach to research.

A brief search using Athabasca's DISCOVER search engine and Google Scholar revealed few studies applying IPA design to simulation-based research (n=3). Leyland explored student midwives' experiences of bereavement using high-fidelity simulation (2022); Ntlokonkulu et al. examined and described the views of student midwives concerning teamwork during an obstetric emergency simulation (2018); and Ritchie et al. assessed the resident's

perception of formative feedback in anesthesia simulation training using IPA research (2020). While the use of IPA research is thus far minimal in simulation-based research, given that SBLEs are founded in experience (and typically within the healthcare setting), IPA was an appropriate methodology to employ to gain a deeper understanding of the experience of learning in a deteriorating patient simulation.

Methods

Ethics approval

Ethics approval was obtained from Athabasca University's Research Ethics Board (Ethics File Number 25634; Appendix B) as well as Fleming College's Research Ethics Board (Approval Number 2024032; Appendix C) before initiating recruitment for this research project. Practical Nursing students who indicated interest in participating in the research project were provided with a Letter of Information and Consent which included details about the research project, expectations of the participant, risks and benefits of participating, expectations and limitations of confidentiality and anonymity, and the process for data collection, storage, and destruction. The process and limits to withdraw consent were also described. An opportunity to ask questions and the option to withdraw was reiterated prior to and after the semi-structured interview.

Funding

Funding was awarded by the Graduate Student Research Fund. $462 was used towards incentives for the participants, and to provide an honorarium to the simulation facilitator and simulated participant.

Participants

Participants were purposefully selected from a relatively homogenous sociodemographic group who were willing to participate in the research project. Homogeneity supports the IPA researcher in gaining a deeper understanding of one group's experience or meaning of an experience. In addition, the aim of this research and IPA research in general is to say something in detail about the perceptions and understandings of one particular group rather than making premature generalizations (Smith et al., 2022). The results are meant to be detailed and applicable to that group, but do not claim that the meaning of this experience is consistent for, or transferrable to other groups (Smith & Fieldsend, 2021). To support homogeneity, all research took place at Fleming College with support from the Fleming College Simulation Centre and the School of Health and Community Services (Appendix D).

Fleming College. Fleming College is located in the heart of Central Ontario with campus locations in Peterborough, Lindsay, and Haliburton. Its PN program in Peterborough and its partnership with Kenjgewin Teg on Manitoulin Island graduates approximately 150 PN students each fiscal year. In the 2023/2024 academic year (the year of this research project), Fleming College increased its enrolment numbers and had approximately 132 students in semester one, 96 students in semester two, 84 students in semester three, and 82 students in semester four, and 77 students completing their final placement hours (consolidation).

Inclusion criteria. To participate in this research project, the participant was required to be a PN student enrolled in third or fourth semester at Fleming College in Peterborough, with clinical experience in an acute care setting within the hospital. These inclusion criteria were important to ensure they have the preliminary knowledge to recognize and respond to a deteriorating patient. Students in consolidation were excluded due to the complexities of

scheduling participants with unique schedules as they completed their consolidation in a wide variety of cities across Ontario in varying clinical settings. In addition, students had to be willing to participate in a SBLE, reflective journaling, and a one-on-one semi-structured interview.

Sample size. For a masters-level IPA research study, a sample size of four to five participants is recommended (Smith et al., 2009, 2022). Given that the focus of IPA is on quality rather than quantity, value was placed in studying a smaller sample size in depth, rather than a larger sample size in breadth (Smith et al., 2022). A smaller sample size allows the researcher to gain insight into how each experience is situated within the participant's world and also make comparisons between each case's data. The intention was to recruit a sample size of six to eight eligible participants to account for attrition. Recognizing the competing priorities of the participants, a larger sample size allowed room for participants to withdraw from the study if they were unable to complete all aspects of the research project.

Although eight participants initially expressed interest, only three participants were able to commit to completing the research study on the original date. Prior commitments to work were the primary barrier cited. To attempt to overcome this barrier to participation, a second SBLE was offered on a different day which allowed one additional participant to participate. No additional SBLE days were able to be offered due to organizational constraints such as access to the simulation space, simulation equipment, and the availability of the simulated participant. A sample size of four was deemed appropriate for this Masters-level research given that the intent was to garner a detailed account of the idiographic experience of PN students during a complex phenomenon (Smith et al., 2022).

Recruitment

Recruitment for this research project was conducted mostly by third parties to mitigate my influence on recruitment as a nursing instructor and the primary investigator. Recruitment was initiated using a recruitment poster, posted as a hard copy both inside and outside of the nursing skills lab at Fleming College and sent via electronic mail to students in semesters three and four by the PN Clinical Coordinator. The recruitment poster included information about the research project, inclusion criteria as well as the expectations of the participants. The poster also described the stipend. As this research required a significant amount of commitment from the participants, they were awarded co-curricular hours for their time spent in simulation, and a $50 gift card to Walmart or No Frills once the one-on-one semi-structured interview was done. The poster also provided information about how potential participants should contact the researcher if they are interested in learning more about the project and/or participating (Appendix E). As six-to-eight nursing students were not recruited for the research project within one week of recruitment, faculty from Professional Aspects in Nursing A and B, as well as Nursing Clinical Practice agreed to share the poster in their classes.

Simulation-Based Learning Experience

Once participants reviewed the letter of information and consent (Appendix F) and informed consent was obtained, students were provided with an overview of the research project via email and received access to an electronic journal. Participants were reminded that journal entries are considered data and would be shared with the researcher. Expectations for participation in all aspects of the SBLE were described, and participants were encouraged to ask questions or seek clarification via email or by booking an appointment with the researcher. Appendix G illustrates an overview of the research design.

Roles

There are several key roles that supported the enactment of the simulation including the simulation operations technician, the simulation facilitator (who also played the role of the clinical instructor), and the simulated participant. Individuals with experience in simulation fulfilled these roles. As the intention of this research was to understand the participants' experience through the perspective of the participant, these roles and responsibilities were not fulfilled by the primary investigator.

Simulation operations technician. At Fleming College, the simulation operations technician has a significant amount of education and expertise related to simulation design, enactment, and simulation technology. They are involved in both the simulation planning and enactment phases of this simulation. Leading up to the simulation, the simulation operations technician provided training for the simulation participant that aligned with the Association of Standardized Patient Educators' Standards of Best Practice (Lewis et al., 2017). At the time the simulation was enacted, they provided a brief to the participants and operated the technology that was used in the simulation. They also de-roled the simulated participant after the simulation. This was intended to support the simulated participant to get out of character, and provided them with an opportunity debrief the experience (Lewis et al.).

Simulation facilitator. The simulation facilitator was one of the authors of the simulation scenario. They have additional education in simulation and debriefing. On the day of simulation enactment, the simulation facilitator supported the prebrief, observed the simulation, and facilitated the debrief discussion. They also played the role of the 'clinical instructor' attending the room when participants were ready to either report their findings, or if they indicated they needed more help. The purpose was to provide scaffolded support as necessary

and to allow the participants to enact the simulation in their current role as a nursing student who would have a clinical instructor to support their clinical practice. The term scaffolding is used throughout this research to describe the instructional approach of providing individualized support to learners when the learning outcomes may not be able to be achieved independently (Coffman et al., 2023).

Simulated participant. A simulated participant (SP; also referred to as a simulation patient) is a person playing the role of a character in a simulation (Lioce et al., 2020). The SP, portraying the role of the patient, was coached by the simulation operations technician and the facilitator to follow a script, communicating and conveying the signs and symptoms of a stroke such as altered level of awareness, difficulty with communication, and right-sided weakness. With experience in simulation education and healthcare, the SP also attended the debrief to offer the perspective of the patient.

Prebrief

One week prior to the simulation, participants were assigned a prebrief which included independent preparation work and briefing details. To prepare for the simulation, participants were provided with an overview of the case, the medication administration record, treatment administration record, and laboratory values. They were encouraged to complete a preparation and planning assignment which is a template that guides learners to research diagnoses and medications, anticipate assessment findings, identify priorities, and plan interventions. They received a written briefing document that provided them with an overview of expectations for participating in the simulation including details about psychological safety, confidentiality, the equipment, the room, and the phases of simulation (Appendix H). Participants were encouraged

to journal their thoughts, feelings, emotions, and reflections on learning during this preparation period.

Next, all participants attended the Fleming College Simulation Centre. The facilitator and simulation operations technicians hosted an in-person briefing. In the prebrief, the aforementioned information was reviewed (Appendix H) and participants had the opportunity to ask questions or seek clarification. Participants were again encouraged to journal their thoughts, feelings, and emotions immediately prior to enacting the simulation.

Simulation Enactment

Following the prebrief, participants enacted a high-fidelity in-person simulation in which the patient experiences clinical deterioration. This scenario (Appendix I) was developed and piloted by nurse educators using simulation at Fleming College and aligned with Healthcare Simulation Standards of Best Practice™ (HSSOBP™; INACSL Standards Committee et al., 2021b). Originally, it was intended to be enacted in groups of two. However, because of the uneven numbers, participants were given the option to enact the simulation as a group of three, or individually. While this does deviate from the original research design, this choice was intended to prioritize psychological safety and ethical research. Three participants enacted the simulation together as a small group; one participant chose to enact the simulation independently. The participant who enacted the simulation independently was offered the opportunity to bring a peer to the simulation. However, they felt confident and comfortable enacting the simulation alone.

The participants took on the role of a nurse, acting within their individual scope of practice as a semester three or four nursing student. The simulation lasted a maximum of 15 minutes and was video and audio recorded. At any time during the simulation, participants were

given the option to ask their 'clinical instructor', played by the simulation facilitator, to attend the simulation room to support decision-making. This was intended to support psychological safety in a stressful clinical setting.

Video recording. The video and audio recordings of the simulation were not used as data for the purpose of the research; however, they were provided to students as an opportunity to learn. Once the video recordings of the simulation were available (between 24 and 48 hours later), the simulation operations technicians emailed participants students were emailed a password-protected link to allow access to their recorded simulation. They were encouraged to review the recorded simulation and were prompted to reflect on their learning using their reflective journal.

Debrief

Immediately after all groups completed their in-person simulation, the simulation facilitator led a group debrief which lasted 60-90 minutes. The simulated participant attended the debrief to provide insight from the perspective of the patient. The debrief aligned with the Promoting Excellence and Reflective Learning in Simulation (PEARLS; Bajaj et al., 2017) debriefing framework supported by the HSSOBP™ and allowed learners the opportunity to reflect on and discuss their thoughts and actions during the simulation and consider how the simulation applies to their clinical practice (INACSL Standards Committee et al, 2021a; Appendix J). The group debrief was not recorded or included as data in the research project. Debriefing is imperative to psychological safety in simulation and overriding this for the purpose of the research study was not warranted. Participants were encouraged to reflect on their learning using their reflective journal after the debrief.

Communication

All communication related to the research project (e.g. introduction, tasks, schedule, prompts for journaling, video recording link, and transcript review) was communicated to the participants via electronic mail. Electronic mail at Fleming College and Athabasca University is password protected and requires 2-step authentication.

Data Collection

Multi-modal data collection was chosen for this study as it offered a choice in how participants explored and expressed the meaning of their experience. Boden and Eatough recognized the need for a more thorough understanding of phenomena or experiences (2014). A multimodal approach to data collection placed value in other dimensions of the sense of experience: the felt sense, the aesthetic aspects of language, and visual imagery (Boden & Eatough). The felt sense refers to a bodily way of knowing which can be difficult to describe. Supporting the participant in acknowledging their felt sense and using reflexivity to explore the researcher's felt sense, lead to a deeper understanding of an experience. Metaphors and the exploration of new language to attempt to accurately describe an experience is an example of aesthetic aspects of language (Boden & Eatough). Visual imagery such as pictures, colours, or other artistic representation can be used to illustrate the meaning of an experience when words do not suffice (Boden & Eatough). Multi-modal data collection may be a more accessible approach to research as it encourages multiple means of action and expression, recognizing that not all participants represent their knowledge in the same way (Centre for Applied Special Technology [CAST], 2018).

Electronic journals

The opportunity for representing knowledge using a variety of self-determined techniques was supported through reflective journaling. Journaling using words, audio, poetry, images, gifs, emojis, videos or doodles intended to allow the participant to explore their experience learning in a deteriorating patient simulation more fully; strengthening the richness of data by encouraging the participant to express their knowledge in multiple ways. Data collected from the reflective journals was intended to support the researcher to "understand more fully" (Boden & Eatough, 2014; p. 160). Electronic journaling was also chosen as it may be beneficial in minimizing the power imbalance between the researcher and the participant given that it provides the participant with space and time to express their knowledge prior to the one-on-one semi-structured interview (Boden & Eatough; Smith et al., 2022).

One-on-one semi-structured interviews

After the SBLE and facilitated debrief, participants attended a one-on-one semi-structured interview, scheduled at a time that was convenient to them. The interviews lasted between 29 to 60 minutes. They took place between 3-5 days after the SBLE via Microsoft Teams. Audio was recorded, and a transcript of the interview was created. All participants gave consent to be recorded. I, as the primary researcher, took notes during and immediately following the interview to ensure accuracy and completeness of the data collected. This reflexive practice also helped to situate me in the interview when later revisiting the transcript for data analysis.

A semi-structured interview guide comprised of open-ended questions guided the interview (Appendix K). These open-ended questions were designed to encourage rich descriptions of the participants' experiences as well as the meaning and cause of meaning for the

experiences. Questions initially started in present tense and were descriptive. As the interview progressed and the participant became more comfortable, questions became more analytical and encouraged consideration of past and future tense. Smith et al. (2022) recommends this format as it encourages the participant to speak about more concrete items first, gradually expanding to more abstract concepts as the participant becomes comfortable. The questions were further influenced by my experience with the topic, and in collaboration with the research study's co-supervisors. During the interview, participants were encouraged to draw from and share relevant journal entries that might help them, and myself, make sense of their experience.

After completing the interview, the transcript was reviewed for accuracy and saved in a password-protected file along with the participant's journal entries. Participants were provided with a copy of the transcript to review and offer clarification as required within one week of receiving the transcript. All participants acknowledged that they reviewed the transcripts and no changes were requested. After that, the audio recordings were deleted, and a pseudonym was self-selected by the participant for each individual case. Pseudonyms are often used in qualitative research to de-identify the data without de-personalizing it (Heaton, 2021). Pseudonyms are recommended in IPA research to support the reader in following each participant's story through the analysis and discussion of the results (Smith et al., 2022). By allowing participants to self-select their pseudonym, they were empowered to determine the identity they would like to maintain and select a name that they feel is a representation of self. To preserve anonymity, I am the only person excluding the participants with access to or knowledge about the pseudonyms.

Data Analysis

Data from the transcripts were organized in an Excel workbook. Each participant had their own sheet within the workbook, labelled as their pseudonym. Each sheet had the following

headings: Source (interview or journal), transcript, exploratory notes, reflexive notes, experiential statements, and personal experiential themes. A fifth sheet labelled group experiential themes, was added with the headings: participant, personal experiential themes, group experiential themes. Smith et al.'s (2022) six-step methodical approach was taken to analyze the data:

1) First, I read and reread the data from one case. This step was important in encouraging me to slow down and fully immerse myself in that participant's case independent of the other cases. This supports idiography in IPA research.

2) Next, I made initial notes known as exploratory notes to begin to analyze and understand concepts and meanings that matter to the participant. This step involves understanding the participant's perception of meaning (phenomenology) and interpreting the way they are making sense of their experience (hermeneutics).

3) Once exploratory noting was complete, I analyzed the notes, interpreting the participant's interpretations (double hermeneutics), and constructing experiential statements. These statements summarize a particular section of the data in a concise manner that embodies the overall sense of that participant's experience.

4) Once experiential statements emerged, I mapped the statements and searched for connections across experiential statements. These groups, known as Personal Experiential Themes (PETs), were named.

5) Once the first case was analyzed, I took time to reflect on and *let go* of the first case in order to immerse myself in the next case, valuing the idiographic principle of IPA. I then moved to the next case and repeated steps one to four.

6) Once all cases were analyzed, I looked for patterns across the cases. I initially attempted to do this in Excel but found this challenging. Instead, I used a different approach recommended by Smith et al. (2022), whereby I had individual strips of paper for each PET. I placed the PETs on a large table and searched for connections. This process was revisited over a three-day period. Finally, I identified and named the Group Experiential Themes (GETs; Appendix L).

Engward and Goldspink encourage an additional step named Step 3b: Attending to reflexive echoes (2020). In this step, the researcher sits with the data and works through the ongoing and challenging act of reflexivity within IPA research (Engward & Goldspink, 2020):

> Where does the researcher begin and end in relation to the data? Where does the data belong and end? Whose voice is whose? What is being lost in-between deciding what is in the data and what to leave out? Why is the data always with us? (p. 4).

Attending to reflexive echoes is described as a challenging and complex process but, when performed correctly, supports rigor and validity in IPA research (Engward & Goldspink). By transparently including reflexive notes along with the analysis of the data within the write-up of the research, rigor in IPA research is supported (Smith et al., 2022). I included reflexive notes within the participant's sheet in the Excel workbook and used Microsoft OneNote to journal about more complex reflexive thoughts. Specifically, I had to be mindful of how my positionality as a researcher was echoing within the analysis. I was careful to harness my experience as a simulation educator and PN instructor, and bracket my experience of recently losing a loved one to unrecognized clinical deterioration. Journalling and documenting this reflexivity helped to distinguish the voice of the participant from my own reflexive echoes. Furthermore, when

transitioning to new cases, I used the reflexive journal to reflect on and bracket my evolving positionality, influenced by previous participants' data.

Write Up

The results section of this research study was initially drafted quite quickly after the data analysis phase. This is encouraged in IPA research to remain embedded in the data and so that immersion is evident in the writing (Smith et al., 2022). To summarize findings, a detailed narrative approach wove together experiential themes using data from the journal entries and interview transcripts to support the emergence of these themes. Rich detail about how the data was analyzed and interpreted is imperative in IPA writing to support trustworthiness. The reader must understand the path that the researcher took to make sense of the data. Without the context, the results are without meaning or validity.

Rigour and Reflexivity

A methodical approach to the design of this research study supported rigour and trustworthiness. Intentional decisions were made to support the theoretical underpinnings of hermeneutics, phenomenology, and idiography. Rationale for decisions were embedded in the description of the methods and are summarized in this section of the paper.

Rigour

Firstly, choosing the appropriate methodology supports rigour in qualitative research. The research question, *What is the experience of Practical Nursing students learning in a deteriorating patient simulation?,* lent itself to IPA methodology. The question aimed to understand the phenomenon of learning. By focusing on a small group of homogenous participants and conducting semi-structured one-on-one interviews, I demonstrated value in the idiographic, or individual, case. The small sample size also allowed for exploration of the

concept of learning in greater depth, rather than trying to understand learning across a wider breadth prematurely.

Honouring the idiographic nature of IPA data collection, one-on-one interviews placed value in the individual participant's experience. To remain immersed in the first case, interview summary notes were made, and researcher reflexivity was documented in a reflexive journal to support trustworthiness. Once data was collected, a hermeneutic approach to data analysis was employed. While carefully studying the way the participant made sense of their learning, I was, at the same time employing reflexivity to consider why I was making the conclusions that I did. This reflexivity is imperative and must be transparent in IPA methodology. As exploratory notes, experiential statements and experiential themes were created, the hermeneutic process was documented and mapped to demonstrate how connections were formed.

Reflexivity

"Reflexivity is a set of continuous, collaborative, and multifaceted practices through which researchers self-consciously critique, appraise, and evaluate how their subjectivity and context influence the research processes" (Olmos-Vega et al., 2023; p. 243). Reflexivity in qualitative research encourages the researcher to explore their positionality in the research process. Reflecting on the influences that are impacting decision-making throughout the research process allows the researcher to consider and address potential biases that may impact the quality of the research or embrace these influences to elevate the quality of the research generated. While some research approaches may attempt to bracket or neutralize certain assumptions, IPA methodology chooses to harness those assumptions to create a deeper understanding of the data (Ortlipp, 2008).

Throughout the planning of this study, reflexivity was used to reflect on and consider the factors, assumptions and biases influencing the research design such as my experience as a certified healthcare simulation educator and my positionality as a PN course instructor. This reflexivity continued to be employed as previously described throughout the research process and the writing up of the results. Reflexivity is imperative in IPA research to support trustworthiness and rigour.

Chapter Summary

Upon approval from both Fleming College and Athabasca University's Research Ethics Board, Interpretative Phenomenological Analysis was employed to explore, describe, and analyze Practical Nursing students' individual experiences learning in a deteriorating patient simulation. Multi-modal data was collected, verified, and interpreted to give voice and make sense of the students' perception of learning in simulation. Guided by IPA methodology, a six-step approach to data analysis was applied, and researcher reflexivity was documented to support rigour and trustworthiness in the research. A detailed narrative approach to writing up the results was taken, weaving together excerpts from the participants' interviews and journal entries with my own analysis of their perceptions of the experience. By illustrating the process of double hermeneutics, the reader is supported in understanding how findings were drawn, supporting rigour and trustworthiness in the results.

Chapter 4. Results

Introduction

The purpose of this research was to gain a deeper understanding of the experience of Practical Nursing students learning in a deteriorating patient simulation. Research questions were carefully designed to understand the essence of learning in a simulation, identify what impacts the experience of learning in a deteriorating patient simulation, and come to know self-perceived implications to clinical practice. Participants were encouraged to take a multi-modal approach to sharing their knowledge to enrich the data collection process.

This chapter examines the three themes that emerged while analyzing the participants' experience of learning in a deteriorating patient simulation. The three themes are stress, connections, and shared knowledge. Excerpts from the participants' reflexive journals and interviews will be shared to support rigour. These excerpts will include a reference to the Excel spreadsheet where the data are organized; the citation will include both the sheet title and the individual cell.

Description of Participants

All participants were upper-level semester students in the PN program at Fleming College. Three students are in semester three, and one student is in semester four of the five-semester program. They have completed at least two clinical rotations, one in long-term care and one or two in acute or subacute units within a hospital. Each participant has engaged with a variety of SBLEs within the curriculum, such as virtual gaming simulations (screen-based simulations), virtual simulations with a simulated participant (SP), and in-person low- and mid-fidelity simulations with a manikin in a simulation laboratory.

At the beginning of the interview, participants were asked to describe themselves both as a person and as a learner. They were also given the opportunity to suggest a pseudonym to represent themselves in the research. Table 4 provides a summary of this information. The semester level refers to the semester they were in at the time of the research.

Table 4

Summary of Participants

Pseudonym	Semester	Gender	Self-Description	Enactment Details
Dolly	3	Female	Organized and analytical	
Matthew	3	Male	Hardworking but procrastinates	Group enactment
Riley	3	Male	Hands-on, active learner	
Energy	4	Female	Prefers to experience learning	Independent enactment

Dolly was a semester three practical nursing student (PNS) who identifies as female. Dolly has experience working as a personal support worker. As a person and as a learner, she likes things to be "very straightforward; no beating around the bush" (Dolly; B25). She takes an organized and analytical approach to learning new concepts, often using mind mapping to organize data which may at first seem disorganized and chaotic.

Matthew was a semester three PNS who identifies as male. He described himself as a hard worker but at the same time criticized himself for procrastinating:

> Sometimes I don't know where to start [when I'm learning something new]. I feel like I want to just leave it there and don't do anything. I feel when it's hard, it's hard to continue on my preparation and I feel lazy a little bit (Matthew; B21).

Riley was also a male semester three PNS. Outside of school, he enjoys activities such as fishing and riding his motorcycle. He shared that he prefers hands-on learning activities, such as simulation, and learns best when he makes his own study notes opposed to reading from a slide deck or listening to a lecture. Riley, similar to Dolly, worked as a personal support worker.

Energy shared that she is an international student who came to Canada a couple of years ago. She, unlike the other participants, was a semester four PNS. As a learner she prefers to experience the learning, "I feel like. . .something I see around myself, or something I hear, or live in in the practice, those things I learn a lot from" (Energy; B16). At the time of the research, she was completing her clinical placement hours in the emergency department and works part-time at a local department store.

Simulation Enactment

To support a safe learning environment, participants were given the choice to enact the simulation independently, or in a small group. Dolly, Riley, and Matthew enacted the simulation as a group of three. Energy enacted the simulation independently. All participants were made aware that they could ask their 'clinical instructor', a role played by the simulation facilitator, to attend the room if additional support was required. To truly understand the participants' perception of learning, I did not observe the simulation. However, it was gathered from the participants' interviews that Dolly, Riley, and Matthew, identified the deteriorating patient's status and vital signs, and then called the clinical instructor to report the critical finding. The clinical instructor supported them with their neurological assessment. Energy identified a change in status and requested support from the clinical instructor early to complete the patient assessment together.

GET 1: Stress

The cognitive demand associated with the deteriorating patient simulation, or perceived to be associated with the simulation, triggered symptoms of stress for all participants. These symptoms were primarily experienced prior to and during the simulation and resolved within the simulation after demonstrating learning outcomes, or in the debrief after discussing the

implications to clinical practice. Despite all participants experiencing some form of stress during the SBLE, participants described these emotions to be both tolerable and an important part of the learning.

Subtheme: Anticipatory Stress

Despite prebriefing and an opportunity to ask questions of the facilitator, three of the four participants seemed to second guess their preparedness for the simulation. This could partly be due to the nature of a deteriorating patient simulation and not being told exactly what will happen in the simulation. Some participants also shared that they felt less prepared after speaking with other participants who seemingly prepared more than they did. Immediately prior to the simulation (after the prebrief), Matthew wrote in his journal, "I felt a little bit scared. I feel like I didn't prepare good" (Matthew, B21). He reinforced his negative feelings with a hand-drawn doodle of a sad face. In the follow-up interview, he was asked to elaborate on the way he felt in this moment:

> My teammate said that maybe the problem came from the IV, or the trops so I said oh my god, I didn't actually care about the IV [while preparing] and I didn't do any [research] about the trops. I feel at that time like I didn't prepare good (Matthew, B24).

Dolly, who submitted evidence of a significant amount of preparation work, described feeling nervous and anxious immediately before heading into the simulation. She appeared to also second-guess her preparation and readiness for the simulation:

> Prior to going in, I am very nervous and anxious. Even though I think I prepared enough, I think I prepared in all the wrong ways. I'm preparing for a curve ball. I'm expecting to find the patient short of breath or something wrong with their heart, or something that we are not expecting at all (Dolly, B39).

Riley and Energy, on the other hand, described feeling confident prior to heading into the simulation. Riley, however, attached a meme to this journal entry which suggested that this confidence may be positive self-talk instead of a true sense of confidence:

Figure 4

Riley's Journal Entry Prior to Simulation

This meme is an image from the movie *What About Bob?* (Oz, 1991). In the movie, when Bob states, "I feel good, I feel great, I feel wonderful!" he is using positive self-talk to overcome symptoms of anxiety. While it is possible that Riley truly did "feel good, feel great, feel wonderful", this meme may have been chosen intentionally to represent the undercurrent of anticipatory stress as he wrote that he was "expecting that there will be a curveball during the assessment, probably a change in condition of the patient or really unsettling vitals" (Riley, B12).

Subtheme: Stress During Enactment

Three participants identified that the fidelity, or realism, of the simulation increased the stress they were experiencing. Matthew described how the reality of the simulation became evident when he entered the room to find the simulated participant (SP) in the hospital bed appearing stressed, "I felt a little bit scared because this is the first time I had met someone who is having a stroke" (Matthew, B23). Energy, who seemed to have experienced the most stress

during the simulation of all the participants, described feeling well-prepared going into the simulation however, she felt her mind go blank the moment she noticed the patient was deteriorating:

> I literally was confident when I entered the room, but as soon as I saw the patient, like, literally having trouble moving her arm and everything, and I saw her having anxiety and not being able to form the whole sentence while speaking, and she was having broken words. So, at that point I was a little afraid. Like, what can I do next to help her? So, at that point, my fear was starting to gradually increase (Energy, B23).

For Energy, it appeared that the fear came from recognizing her own reaction in the simulation and reflecting on the implications to clinical practice.

Dolly, like Energy and Matthew, felt an increase in her anxiety level when she met the patient. However, unlike the other participants who described the situation using negative emotions, she described it as an adrenaline rush with a more positive connotation:

> You know it's a real person. And you know it's a real situation, with real emotions and real feelings. With a manikin you're not experiencing that human connection. . .you don't feel the urgency. You don't feel how serious it is (Dolly, B33).

One participant, Riley, described only "a little bit of anxiety" during the simulation (Riley, B16). In reviewing his reflective journal entries, and in our discussion about simulation, Riley appeared to take a more laid-back approach to SBLEs. "I'm either going to know it, or not know it" (Riley, B15). He embraced the concept that simulation is a safe place to learn, and the fidelity of the simulation does not seem to infringe on that sense of security in the same manner as the other individuals. He stated, "I know that this is not for grades and if I killed the patient at the end of the day, nobody would really care because we were just focusing on the learning

aspect of it" (Riley, B16). When asked to elaborate on this in the interview he shared that the little bit of anxiety that he experienced was associated with the worry that he is not as competent as he perceived himself to be. He shared, "I feel like I'm pretty confident for a semester [three] nursing student, but if I couldn't do this simulation well, then maybe I wasn't as far along with my learning as I thought" (Riley, B16).

Subtheme: Importance of Stress

While all participants reported experiencing stress at some point during the SBLE, all participants shared that they felt this stress was tolerable and an important part of their learning:

> I feel like it's not a fear that [makes] you want to run straight out of the room or something. It's just a fear that we can tolerate. I can't control it, it's just a normal fear like every emergency situation when you fear the person will die or something like that (Matthew, B26).

Dolly described this stress as necessary to prepare for a career in nursing:

> You need to have stress. You need to have the realization and be prepared to deal with it because you're going to have it in the field. Like, there is always some type of stress in healthcare. . .and you need to know how to handle it and address the [situation] appropriately (Dolly, B37).

Energy, throughout the interview, seemed surprised at the stress she experienced during the simulation but was glad to learn about her reaction to stress in a safe environment:

> You actually need to see a patient or person having those symptoms and you being there to [see how you] react, how you calm down, that's the thing (Energy, B24). I still have more things to learn and to be in such situations where I can actually learn and calm

> down my own reactions and anxiety and fear and those feelings so that will give me a space, or you know, like time to think about what you need to do (Energy, B13).

The perception that stress in a deteriorating patient simulation is important may come with the caveat that the stress or fear resolves within the SBLE. Matthew, who felt that the fear experienced during simulation may come from feeling unsure of oneself, believes fear in simulation to be tolerable and self-limiting, resolving when the problem is identified. He exclaimed, “We knew exactly what we need to do so then that fear is not there anymore” (Matthew, B25).

Energy, who shared that her mind went blank during the simulation, felt that her symptoms started to resolve when she called the ‘clinical instructor’ (played by the simulation facilitator) into the room to support decision-making:

> Now I had someone to talk about like what can we do next? So, at that point I felt a little confident. Okay, so I have my instructor or someone that I can talk to if I’m doing something wrong or if I need to help my patient. So that was the moment I felt that the fear is a little bit subsiding, like it’s going (Energy, B28).

Participants shared that stress experienced in a deteriorating patient simulation may stem from a variety of factors such as the anticipation of what to expect, performance anxiety, or the fidelity of the simulation. However, these feelings of stress resolved when the SBLE was complete, regardless of their performance in the simulation. The simulation facilitator played an imperative role in this resolution, playing the role of the ‘clinical instructor’ who provided support with decision-making, and by facilitating the debrief conversation. The participants in this research study believe that experiencing stress in a simulated environment supports self-awareness and readiness for clinical practice.

GET 2: Connections

In analyzing the interview transcripts and reflective journal entries, the theme of making connections continued to recur. For some participants, this involved making tangible connections between theory and simulation. For others, this involved drawing from clinical or work experience to support decision-making in preparing for and enacting the simulation. Connections were perceived to enhance both readiness for the simulation, and readiness for clinical practice.

Subtheme: Connections to Theory

In preparing for the simulation, participants primarily drew from theoretical knowledge to guide how they prepared for, and subsequently made decisions in the simulation. For Dolly, this process is a physical process. She uses mind maps to visualize the connections between theoretical knowledge and identify potential outcomes that may occur during the simulation. When writing about and discussing how Dolly prepared for the simulation, I pictured an explorer looking down several different pathways. On each path, there are things to learn and support success in the simulation. Exploring these pathways (illustrated below) helps her to prepare for the simulation, "I made a mind map to help me visualize important information" (Dolly, B17; Figure 5).

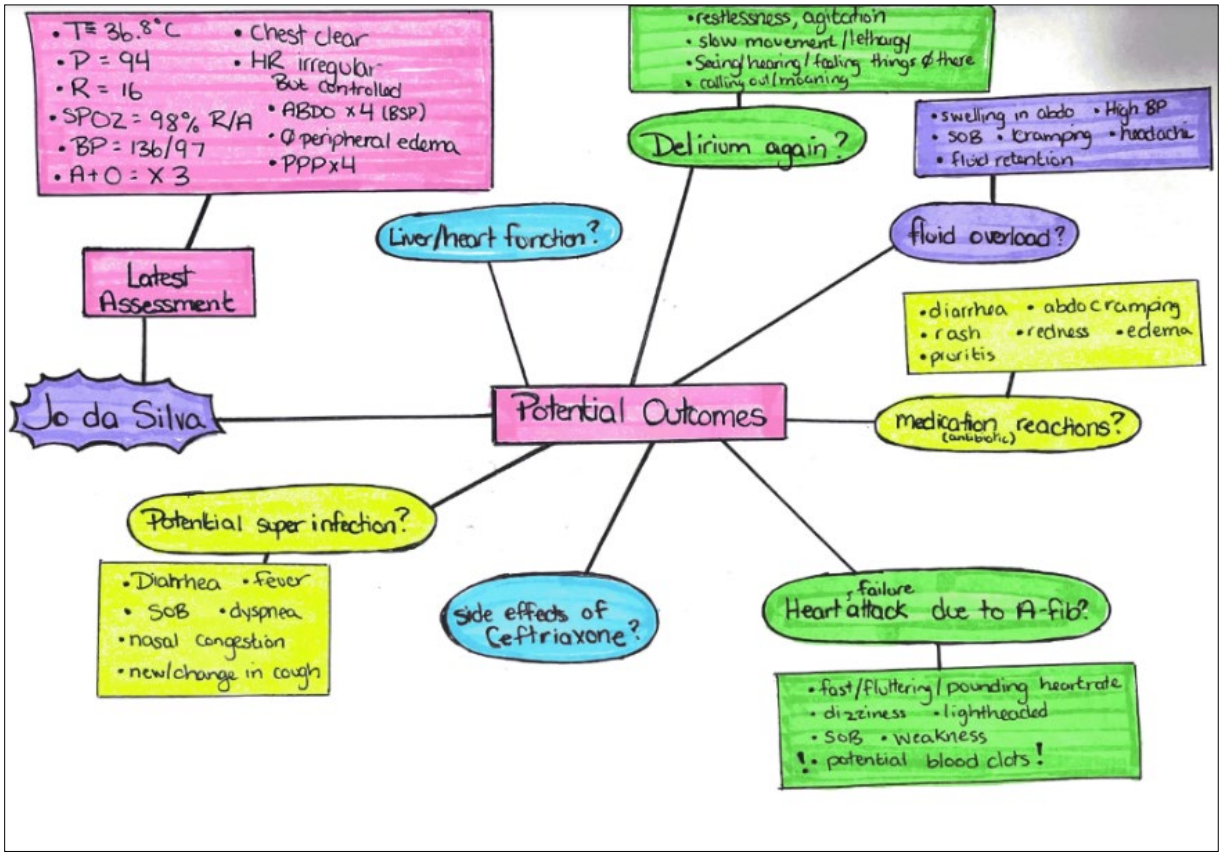
Matthew also describes an exploratory approach to preparing for simulation. He starts by reviewing the information provided, then refers to theoretical content to gain a deeper understanding of the scenario:

> [I read that] they stopped the Rivaroxaban and that's the anti- the blood thinner. They put that on hold. I didn't know exactly what [hold] meant so I searched that, so then I know that the hold is not a permanent stop, they've just temporarily stopped the medication. Then I see they have A. Fib. I researched A. Fib and then I saw that A. Fib can cause a

stroke and I read that the blood thinner is to prevent clots from A Fib. And then I watch a video about stroke and get all the information I need (Matthew, B18).

Figure 5

Dolly's Mind Map



Riley took a more laid-back approach to preparing for the simulation. He revisited his class notes related to health assessment and medications that the patient was taking. However, he decided to keep an open mind when preparing for the simulation. He acknowledged that simulation is a safe place to learn and makes mistakes:

Someone who prepares extremely well for everything definitely could have made preparation, made it more difficult, because [they could] go down every rabbit hole of what could [happen] and just went over absolutely everything. Whereas it made it almost

> easier for me because I was under the assumption that I'm not going to know what the curveball is so there's no point preparing for it. I'm either gonna know [what to do] or not know [what to do]. Be prepared to be unprepared for everything (Riley, B15).

Dolly, Riley, and Matthew indicated that they felt making connections to theoretical content during the preparation phase of the SBLE helped them to be successful during the simulation. All participants described a point during the simulation when their preparation and underlying knowledge came together to support recognizing and responding to patient deterioration. This was described by all participants when asked to journal immediately after the simulation, and before debriefing. When asked the question, what was your biggest "AHA!" moment in the simulation, Dolly wrote:

> Because I prepared and researched her diagnosis and current medications, I was able to quickly see that she was having a stroke and that it was a frontal lobe stroke. Knowing what her medications were for and how they affected her really helped me to quickly know what was wrong (Dolly, B21).

Matthew, Riley, and Energy all expressed similar moments of success. However, Energy's theoretical connections were primarily made in collaboration with the simulation facilitator during debrief. For example, immediately after the debrief, Energy wrote, "The 'AHA' moment was to know why rivaroxaban was on hold. I was actually learning what medications, like why it is for and what not giving it to the patient can do" (Energy, B24).

The moments where these connections are formed are meaningful for the participants. When asked to describe these moments, excitement was evident by inflections in their voices such as pitch and tone. Dolly, smiling, described how she felt when connections were made:

> The moment that everything clicked. . .it was really cool! It was like, oh my goodness, this makes so much sense! Then I knew it was a stroke, and I knew the signs and symptoms of it. I knew what to do next! (Dolly, B27)

Making these connections in simulation was motivating factor to continue to work hard:

> Experiencing [responding to a deteriorating patient in a SBLE] is motivating me even more! I want to have the knowledge to be prepared and be able to help my patients in an accurate and timely manner (Dolly, B14).

For Matthew, making these connections is proof of all the hard work that has precluded the simulation:

> I used to play American football. So we had work every day. We training and then we are training by yourself every day. So at that point we have opportunity to show up for ourself. That's how we show. So, like I say, show right here is you show everywhere you can. . .I show my skill, I show my hard work (Matthew, B20).

In listening to Matthew, I understood that he feels like learning in the nursing program is a very independent experience. He feels like he is training alone. Then, on game day, the simulation, he had an opportunity to demonstrate the knowledge that he has acquired; the proof that all the independent training he has been doing was effective and worthwhile.

Subtheme: Connections to Previous Clinical Practice

Riley and Dolly, who both work as personal support workers (PSW), reported intentions to rely on previous experience in the clinical setting to support their success in the simulation:

> Some things I am hoping will support me through the simulation is my years of experience as a PSW. We know, as PSWs [how] to recognize signs and symptoms of

> UTIs and delirium. I'm hoping that this knowledge will help me to critically think through whatever situation the simulation gives (Dolly, B19).

Riley shared, "I am drawing on some helpful tips I learned during admissions assessments that I believe will be helpful" (Riley, B15).

While Riley and Dolly were able to independently draw from and apply learnings from abstract scenarios to support success in the simulation, Matthew and Energy, who have only been in the clinical setting as nursing students, did not initially anticipate a direct connection between the simulation and clinical practice. However, when asked in the interview, they were able to think of situations that had occurred in clinical practice that were akin to some aspect of the simulation. Matthew described a time at clinical practice when the staff assist button was activated for a medical emergency:

> One time when I go to clinical and in one person's room, they pushed the staff assist button. I don't know why I just know they pushed it and all the units run straight to that room. Everyone, even in the medication room run really fast to get there (Matthew, B14).

Energy described a time at clinical practice when she felt a similar sensation of fear for the patient:

> There was one time where I can remember in second semester of clinical when I tried to help the patient go to the bathroom for daily care and he had weakness, like he was literally shaking and wobbling" (Energy, B18).

All participants made connections to previous clinical experience. Those with more experience in a clinical setting, made connections to clinical practice more readily. Participants with less clinical experience required more prompting to make these connections.

Subtheme: Connections to Future Practice

All participants perceived that responding to a deteriorating patient will support future practice in the clinical setting. Riley and Dolly believe the learning that occurred in the SBLE made a lasting impression. Riley stated, "I will never forget anything that we learned from the simulation for years" (Riley, B20). Dolly believes, "This is definitely going to be something that sticks in my head" (Dolly, B23).

Although all participants shared that they believe the simulation will support future practice, there was evidence in some of the participants' data that knowledge was not fully developed and may not immediately translate to the clinical setting after one simulation. Matthew showed awareness of this knowledge gap in the interview when he recounted what he will do if he happens upon the same situation in clinical practice:

> But if I, when I assess deeper and the person is having a stroke, I feel like in the facility, do we have a stroke button, or not? But I think we just have a code blue button right? So, I will pull the code button right away because I'm a student and I don't know what exactly to do (Matthew, B15).

Energy felt the simulation would support future practice, "Because I know what I can do next if I have the same scenario in my consolidation or event after I become a nurse" (Energy, B29). However, excerpts from her journal indicate that there may be knowledge gaps that require further development. For example, in one reflective journal she wrote that she "now know(s) that rivaroxaban was on hold because of the stroke" (Energy, B24). However, in this simulation, the medication was on hold because of a fall. Holding the medication is what likely contributed to a stroke.

While all participants perceived a connection to future clinical practice, it should be noted that connections to future practice are only anticipated by the learners and cannot be evidenced at the time of the SBLE. However, the participants' ability to connect the SBLE to future practice demonstrates their belief in its meaningfulness. This indicates that they view the SBLE as a beneficial learning experience. This is reinforced by statements such as, "We need to do more of these [simulations]. . .I wanna keep doing this!" (Dolly, B23) and "I really love simulation. This helped me gain [knowledge] and learn from the mistakes I made" (Matthew, B34). As well as, "I feel like simulation help me a lot" (Energy, B21).

Get 3: Shared Knowledge

The concept of shared knowledge was another common theme that emerged during analysis of the data. Knowledge was developed as a community of learners and facilitators. It was evident that the individuals involved in the SBLE guided the learning and shaped the learning outcomes.

Subtheme: Participants Shape Learning Outcomes

For all participants, the debriefing phase was identified as a pivotal learning phase in the SBLE. It was identified that alternative perspectives shared in the debrief by peers, the facilitator, and the simulated participant contributed insight and knowledge that may not be realized without a community of learners. For Dolly, this knowledge came from hearing the perspective of the simulated participant, the facilitator, and her peers:

> After talking in the debrief, I realize my communication to my patient and fellow nurses is key. I didn't vocalize my findings loud enough or firm enough so that my colleagues knew what I thought was happening (Dolly, B25).

When asked to elaborate on how she came to learn this she replied, “Hearing from the patient themselves was really helpful; What they were feeling, the things that they noticed from their perspective” (Dolly, B32). “I definitely learned from my peers as well. They have a different approach [than me]” (Dolly, B29).

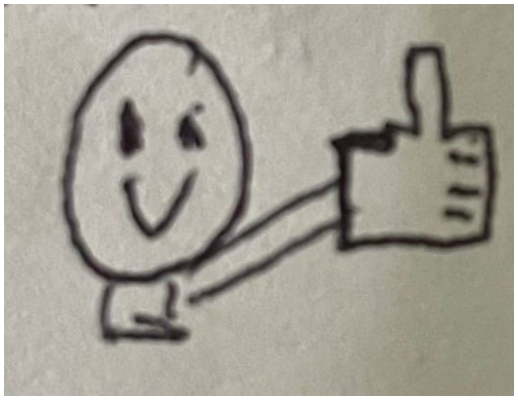
Riley, similarly, referenced the knowledge sharing that occurred in debrief, “We didn’t just talk about simulation. We talked about situations in different hospitals that everybody had [experienced]. Like personal situations” (Riley, B31).

Making connections and learning from one another was a highlight of the SBLE for Matthew. This is described and illustrated in his post-debrief reflective journal:

> I feel great when we did the debrief. I learned a lot from the clarity of the instructor, and I also learned from how my teammates felt. They explained why they did this or did that in the simulation and this helped me to learn a lot (Matthew, B28).

Figure 6

Matthew’s Doodle



Unlike the other three participants, Energy enacted the SBLE as an individual, not as a member of the group. She did report learning from the facilitator (in both the simulation and the debrief), however the concept of shared knowledge building was not evident in her reflective journal entries or interview. While learning still occurred in the SBLE, it seemed to be more

didactic than constructive in approach. This is depicted by the words chosen by the participant such as “I learned it from [the facilitator]” (Energy, B24), and “[the facilitator] explained that. . .” (Energy, B26), as well as “[the facilitator] told me” (Energy, B27).

In reviewing these responses, I recognize the impact that the individual learners and the facilitators have on the learning outcomes that occur in a SBLE. While a simulation may be identical in design, learners (and the facilitators) bring their own unique experiences and perspectives to the SBLE. These perspectives influence what is learned, and how it is learned.

Subtheme: Working as a Team

Depending on whether participants enacted the simulation as a group or as an individual impacted the learning outcomes. As previously mentioned, Energy participated in the simulation independently, and therefore did not identify role clarification and teamwork as a learning outcome of the simulation. However, Riley, Dolly, and Matthew, who completed the simulation as a group, described learning about their own roles and responsibilities as a member of a group, and navigating the challenges of communication in a deteriorating patient simulation. Riley shared that the moment he felt unsuccessful during the simulation, was also one of the most rewarding learning moments for him as he learned from his peer:

> My thought process kind of changed after their vital signs were normal and it was communicated that there were other findings that were not consistent with infection. I didn’t just shut down though. . .I kind of just went to ‘k, not an infection, my friend here knows more about the situation so I should probably communicate with her about this’ (Riley, B29).

Although he shared that he would be interested in completing the simulation again independently, he recognizes that he would not have learned how to communicate with a team if he were to participate in the simulation alone:

> There would not be the same learning benefits for the communication. I think we still would have got the benefit of walking into something unexpected and learning about that situation and being able to communicate to our instructor. But we would only be communicating to our clinical instructor after we found out something was wrong. Really, communicating between us to discover what was wrong was uh, a new experience for all of us (Riley, B28).

Dolly, the 'friend' that Riley mentioned, shared that she was able to quickly identify the reason for deterioration in the simulation and reflects on the challenges of balancing advocating for a patient in simulation while respecting her teammates' right to learn simultaneously:

> I did say 'oh, I think it's a stroke' but I didn't get their attention. I didn't advocate enough, ya know? I don't think I advocated enough and communicated enough to my team that like, 'no, this is really what I think it is!' (Dolly, B30).

It was evident from her tone and body language that Dolly struggled to balance simulation fidelity with teamwork in a learning environment. In reflecting on this myself, I believe Dolly would be more likely to be assertive in a clinical setting or in a simulation independently, however the simulation environment adds an additional expectation: the learner is expected to be a respectful team member sharing the experience with other learners.

Matthew, from his description, took on a more passive role during simulation, observing his peers as they completed their assessments. When asked about this, he explained:

> My thought is because my teammate, she also knows the person have a stroke. My teammate easily goes to do the proper assessment, so I just stand there because what her and I gonna do. . .you prove what you think by assessment, but if you are the same thinking, so you cannot, like, cannot do the assessment at the same time Matthew, B31).

When asked if he would have preferred to enact the simulation independently or in pairs, he affirmed that he felt the group of three was the best way to support critical thinking because of the opportunity to "learn from what other people are doing" (Matthew, B32).

Although role clarity was not identified as an intended learning outcome, when the participants completed the simulation together, they noticed how they interacted with one another, and interacted as a member of the team. It should be noted that these learning outcomes may be influenced by the fact that learners are aware it is a learning environment and feel like they need to share the experience (and the learning) with their peers. Performance, therefore, may not accurately represent the way an individual would interact with a team in a clinical setting.

Chapter Summary

This research explored the experiences of PN students learning while enacting a deteriorating patient simulation. Data collected through reflexive journals and one-on-one semi-structure interviews revealed three main themes: stress, connections, and shared knowledge. The theme of stress was explored, and it was determined that, while all participants experienced some degrees of stress during the SBLE, this stress was tolerable, self-limiting, and an important contributor to learning. Learning in a deteriorating patient simulation also occurs by making connections. This theme explored the connections to theoretical knowledge, previous clinical experience, and when considering implications to future practice. It was also identified that the

learning outcomes that are achieved in a SBLE were a construct of the collaboration between facilitators and the participants, created by sharing knowledge and working as a team.

Chapter 5. Discussion

Introduction

The results chapter of this paper described the key themes identified through the research. Participants shared that the PN students' experience of learning in a deteriorating patient simulation is stressful but meaningful. Additionally, learning happened by making connections between theory and the clinical setting, and learning happens as a group. In this chapter, I will situate these findings within the existing body of literature and make recommendations for practice, and for future research.

Stress

This research study finds that learning in a deteriorating patient simulation is a stressful experience for PN students which is consistent with university-level nursing students' experiences (Ignacio et al., 2015; Small et al., 2018; Yockey & Henry, 2019). This research specifies that stress arises from anticipation of what to expect in the simulation, feeling unprepared, and performance anxiety. Further, the fidelity or realism of the simulation increases stress levels for some participants. However, it is evident in the data that when scaffolded or individualized support was provided, the stress resolved, and students felt better prepared to recognize and respond to a deteriorating patient in a clinical environment. The subthemes of *anticipatory stress, stress during enactment,* and *importance of stress* will be discussed and compared to current literature.

Anticipatory Stress

Data from this research demonstrates that PN students experience anxiety in anticipation of the simulation. This is a common experience for university-level nursing students as well (Hansen et al., 2021; Yockey & Henry, 2019). It is attributed to the sense of being observed, role

preparation, performance anxiety, receiving feedback, and the use of video (Yockey & Henry). Participants in this study confirmed that the sense of being observed, concerns about performance, and feeling unprepared contributed to their pre-simulation anxiety. The SBLE in this research included independently assigned pre-simulation work (preparation), and a discussion about important ground rules of the SBLE (briefing). This is intended to establish a shared understanding of the simulation and promote a psychologically safe learning environment (INACSL Standards Committee et al., 2021b).

There is evidence in the data that some learners may not have the ability to prepare for the simulation independently; this was associated with increased cognitive load or taxing of mental resources, increasing pre-simulation anxiety. Other research demonstrates a decrease in simulation anxiety by preparing learners using expert modelling videos and pre-simulation evaluation rubrics (Dodson & Reed, 2024), preparing with a community of learners (Liu et al., 2021), pre-simulation care plans, and facilitated case deconstruction (El-Hussein & Harvey, 2023). In reflecting on simulation design, it is evident that independent preparation for this SBLE does not adequately prepare all PN learners for the simulation. This research highlights that learners in simulation have diverse self-directed learning strategies which impact their ability to prepare for simulation; the ability to prepare impacts cognitive load and therefore pre-simulation anxiety. Factors to improve and ensure simulation readiness should be incorporated, especially in preparation for highly stressful simulated events such as patient deterioration.

The curve ball. Some participants in this research described anticipating a “curve ball” or unexpected event which contributed to anxiety prior to the simulation. Patient deterioration simulations are, by design, a “curve ball” and are identified as a deceptive educational model (Stephen et al., 2023). One systematic review of medical simulation concludes that some degree

of deception in healthcare simulation is considered a valuable pedagogy which challenges learners by increasing the fidelity of simulated events (Stephen et al.). However, there is acknowledgement of the potential for psychological harm to learners if simulations are not facilitated effectively, or if a sense of distrust is created between the learners and the facilitators, or among the learners themselves (Calhoun et al., 2020). When not properly facilitated, lasting harm, described as training scars, may linger and influence future experiences with simulation, and possibly clinical practice (Aller et al., 2024).

Data from this research demonstrate that the PN participants felt supported in the deteriorating patient simulation knowing that it is a safe place to learn. Stress lessened when they collaborated with their peers, and when individualized support from the simulation facilitator was provided at the time that they requested it; this allowed the learners to identify the amount of support they required to complete the simulation objectives successfully. For example, for Dolly, stress resolved when she could meet the cognitive demands of the simulation. For Matthew and Energy, stress resolved when they received support from the facilitator in identifying deterioration and responding appropriately. For Riley, stress was minimal knowing that he was working with his peers who were able to support decision making. These are factors which are demonstrated to decrease cognitive load or cognitive stressors in nursing students (Fraser et al., 2015; Rogers & Franklin, 2021) and were imperative to the resolution of stress for the PN participants. This reinforces the importance of balancing the deception of a deteriorating patient simulation with simulation design factors that optimize cognitive load (Rogers & Franklin).

Stress During Enactment

Stress during enactment of a deteriorating patient simulation is described in university-level nursing students (Abelsson et al., 2020; Ignacio et al., 2015; Nakayama et al., 2018, Small

et al., 2018; Yockey & Henry, 2019), medical students (Barbadoro et al., 2023), and health sciences students (McGuire & Lorenz, 2018). The data in this study identify that PN learners experience stress during enactment of the simulation as well. Participants in this study shared that the fidelity of the simulated participant increased their perceived stress when compared to previous high-fidelity simulations with a manikin. This is inconsistent with Ignacio's findings which conclude no significant difference in measurements of stress when comparing a high-fidelity manikin to a simulated participant. However, the PN student participants in this study had not previously enacted an in-person simulation with a simulated participant. This could explain the perception of increased stress related to the simulated participant as the addition of unfamiliar simulation components may be a trigger of stress in simulation literature (Nakayama et al.).

Participants in this study also reported experiencing stress when they identified that the patient's condition was deteriorating. A sense of responsibility for the patient's well-being (Dolly, Energy, and Matthew) and the perception that they did not have the knowledge to respond appropriately (Energy and Riley) triggered this stress. Stress from a sense of responsibility and the perception that knowledge does not correspond to demands is consistent with findings in university-level nursing students (Abelsson et al., 2020). Rogers and Franklin (2021) explain that mismatched simulation objectives to learner ability and simulation fidelity are two factors which increase cognitive load in nurses during simulation. Increased cognitive load may increase stress and impair performance in simulation (Say et al., 2019). This is evident in data collected from Energy who described her mind "going blank" during the simulation when the gravity of the situation was realized (Energy, B32).

Results of this study indicate that stress experienced in simulation is alleviated when learners receive support from the clinical instructor and from their peers. Energy described a resolution of stress when the clinical instructor supported her decision-making. This is akin to Chapelain et al.'s (2015) findings that cueing by an instructor via an earpiece is associated with decreased stress and improved decision-making. The data also reveals that working together to achieve the learning objectives of the simulation lessens stress. Expressions of feeling safer in a group align with El-Hussein and Harvey's (2023) findings that working together to "fill in the gaps" and "[working] with each other's weaknesses" is a reprieving practice for third year nursing students that contributes to the sense of a safer learning environment. The findings of this research indicate that factors which alleviate stress during a stressful SBLE include support from the simulation facilitator and from peers.

Importance of Stress

Despite all participants reporting some degree of stress before or during the deteriorating patient simulation, they felt that this stress helped to prepare them for the clinical setting and was a valuable learning experience. This is congruent with findings in university-level nursing students (Cantrell et al., 2017; Ignacio, 2015; Small et al., 2018). Although excessive stress is often associated with impaired learning and performance (Reed & Ferdig, 2021; Rogers & Franklin, 2021; Say et al., 2019; Yockey & Henry, 2019), results from this study align with Rudland et al.'s (2019) proposal that some stress, that does not advance to distress, may contribute to stress-related learning and growth. There is evidence in the data that indicate that providing the learners the opportunity to realize and reflect on their own response to a stressful clinical event did support some PN students in stress-related learning and growth. However, while data in this research suggest that stress experienced in a deteriorating patient simulation is

consistent with stress that would be experienced in clinical practice, Bong et al. (2016) note that stress experienced in simulation may be higher than stress experienced in clinical situations. This research proposes that the simulation facilitator can (and should) be leveraged to help students to function in the context of anxiety (Reed, 2022), and to avoid training scars from stressful simulated events (Aller et al., 2024).

While this current research does impart that experiencing stress in a deteriorating patient simulation is perceived to be a valuable learning experience for PN students, the participants all shared moments where it was evident that their stress resolved. It seems logical that this resolution of stress contributed to the sense of value in experiencing stress. Similarly, one study with diploma- and university-level nursing students in Norway purported that resolution of stress is associated with students self-reported competence and a feeling of security (Hansen et al., 2021). Moreover, practices that contribute to reprieve of stress, such as facilitated prebriefing, scaffolded enactment, and structured debriefing are associated with a sense of safety in university nursing students (El-Hussein & Harvey, 2023). This sense of safety is evident in the data and considered essential to optimizing learning in simulation (Turner & Harder, 2018).

The findings noted within the *stress* group experiential theme affirm that, consistent with university-level nursing students, learning in a deteriorating patient simulation is a stressful experience for PN students. The findings indicate that this stress results from feeling unprepared and anticipating that the cognitive demands of the simulation will exceed the student's cognitive resources or capacity. Furthermore, stress may be heightened by the fidelity of the simulation, particularly the realism of a simulated participant or the sense of responsibility. However, when a safe learning environment is fostered and the facilitator and peers provide scaffolded support, the stress experienced in a deteriorating patient simulation resolves and is perceived to be a valuable

learning experience. It is imperative that simulations are designed to prioritize a psychologically safe environment and optimize cognitive load. This study identifies that PN students may require a high degree of scaffolded support, particularly during the prebrief, to reduce stress and therefore improve psychological safety. Furthermore, the resolution of stress during enactment and in debrief is essential to create a positive learning experience.

Connections

When exploring the PN students' experience learning in a deteriorating patient simulation, the theme of making connections is associated with knowledge synthesis. Most participants were able to make connections to the theoretical curriculum. Some participants drew on previous work or clinical experiences to prepare for the simulation. Others required prompting to make connections between the simulation and clinical practice. This research finds that the learning that occurs by making these connections in the deteriorating patient SBLE is perceived to be a relevant and meaningful learning experience to help impact future clinical practice.

Connections to Theory

Participants in this research study indicated that they learned by making connections to theoretical knowledge before, during, and after the SBLE. The data in this research offers insight into the uniqueness of each participant's approach to preparing for a simulation. While all participants reported making connections to theoretical content during the preparation phase, they approached preparing for the simulation in very different ways, resulting in them feeling more or less prepared than their peers. There is variation in the time spent preparing and the depth to which they studied the preparation content. This variance in self-directed learning skills is described in university-level nursing students as well (Kunjukunju et al., 2022).

It is evidence in the data that connections to theoretical content were not always made independently. When a shared mental model is not established prior to enactment of the simulation learners feel inadequately prepared for the educational content of the SBLE (INACSL Standards Committee et al., 2021b). The Healthcare Simulation Standards of Best Practice™ Prebriefing document recommends the simulation facilitator *consider* additional preparation activities on the day of the SBLE such as a student planning session (INACSL Standards Committee et al., 2021b). However, based on the experience of the PN participants in this study, this should be a mandatory component of simulations that are anticipated to have a higher cognitive load. This is consistent with recommendations that facilitators take an active role in preparing students for deteriorating patient simulations (Mohammed, 2020). This reinforces the importance of the simulation facilitator in ensuring a shared understanding of the simulation is achieved prior to enacting the simulation (Boese et al., 2013; Solli et al., 2020). Additionally, it emphasizes the importance of assessing independent learner readiness for simulation (INACSL Standards Committee et al.).

As evidenced in the data, the simulation facilitator plays a pivotal role in supporting participants to make connections between theoretical content and the simulation not only in the prebriefing period, but also during simulation enactment and during the debrief. This reiterates the importance of having a person competent in the process of debriefing, and well-versed in the SBLE's intended learning outcomes to lead the debrief (INACSL Standards Committee et al., 2021a). An integrative literature review (Carless-Kane & Nowell, 2023) echoes the importance of a supportive and knowledgeable educator to facilitate the transfer of theoretical content to the clinical environment. Furthermore, Carless-Kane and Nowell propose that providing strategies to promote connections between theory and practice further enhances the ability to transfer this

knowledge to the clinical setting. Given that PN students are novice learners with typically only an introductory level of clinical experience and variance in self-directed learning skills, a facilitated preparation and planning session, as well as a rigorous debrief, are strongly recommended to support PN students in making connections between theoretical content and the simulation.

Connections to Clinical Practice

This research finds that some learners prepare for enactment of the simulation by reflecting on previous and similar clinical experiences. The data reveals that this was easier for PN students with more clinical experience (for example as a PSW). This is consistent with Benner's Novice to Expert Theory (1984) whereby novice nurses, in this case novice nursing students, with minimal experience rely heavily on guidelines to support their clinical judgement and actions. As experience is accrued, novice nursing students start to draw from previous experiences to guide their clinical judgement. This was echoed in Riley and Dolly's data who were able to draw from previous clinical and work experiences quite readily to support preparation and enactment of the simulation.

In the context of Kolb's Experiential Learning Theory (1984), it is likely that more experienced practitioners apply previously synthesized knowledge to the current SBLE, whereas less experienced practitioners are essentially starting the learning process from the beginning. Kolb explains that the experiential learning process takes practice to develop and shares that experienced learners (or practitioners in this case) have a larger body of experiences to draw from which may allow them to engage more deeply with the learning process. This research finds that PN student learners with less experience are, however, still able to make connections to previous clinical placement experiences. This requires prompting from the simulation

facilitator in debrief and may require follow-up reinforcement after the simulation. Similar findings are discussed by Chernikova et al. (2020) who conclude that learners with previous experience may require only scaffolded support – a temporary shift in control of the learning process from learner to teacher – during simulation. Whereas learners with a low level of prior knowledge benefit from increased support and guidance.

Thomas and Kellgren (2017) propose that Benner's Novice to Expert Model be applied to simulation design to determine what resources need to be employed to scaffold the SBLE appropriately based on learner level. This study adds that this should be carefully considered not only at the program level of the learner, but within the context of the individual learner themselves. The HSSOBP™ emphasizes the importance of having a skilled facilitator who can create a safe learning environment which supports learning and allows for flexibility based on different learners (INACSL Standards Committee et al., 2021b). This research highlights the importance of that flexibility in supporting learners with diverse clinical experiences to make connections between previous experiences and the SBLE.

Connections to Future Practice

Data in this research purports a direct correlation between the simulation and future practice clinical practice. PN students believed that participating in a deteriorating patient SBLE would support their future clinical practice. They reported feeling more confident and more prepared to recognize and respond to a deteriorating patient in the clinical setting. This is consistent with the literature for university-level nursing students (Chadwick & Withnall, 2016; Dix et al., 2021; Goldsworthy et al., 2019; Goldsworthy et al., 2021; Ignacio et al., 2015; Kelly et al., 2014; Liu et al., 2021; Lucktar-Flude et al., 2015; Merrimen et al., 2014; Small et al., 2018) and a small sample of Enrolled (diploma-level) nursing students (Kelly et al., 2014).

Participants also sensed that learning about their own reaction to a stressful event in a simulated clinical environment helped them to be aware of how they may react in a clinical setting. This is similar to Ignacio's (2015) findings which describe that the learners perceive deteriorating patient simulations supported the development of their emotional intelligence to manage stressful events in the clinical setting.

While the data identifies that PN students believe that learning in a deteriorating patient SBLE will impact their future practice, actual implications to clinical practice were not measured and impact on patient safety outcomes remain a gap in the literature (El Hussein & Cuncannon, 2022; Franklin & Luctkar-Flude, 2020). While there is evidence from some participants that knowledge and critical thinking would likely translate to the clinical setting, there is also indication in the data that some participants did not attain (or retain) the intended learning outcomes after the SBLE and may require repetition of the SBLE to support intended learning outcomes. There are instances where participants demonstrated awareness of the knowledge gaps, and examples where participants remained unaware of the knowledge gaps. The role of the simulation facilitator is a resource to support recognizing these limitations when leveraged appropriately (INACSL Standards Committee et al., 2021a). Consistent with university-level nursing students, repetition of deteriorating patient simulations may be required to demonstrate mastery of learning outcomes (Goldsworthy et al., 2022; Lucktar-Flude et al., 2015; Merrimen et al., 2014). This should be considered and evaluated in PN students in future research.

The participants in this research shared that the deteriorating patient SBLE was a meaningful learning experience. This is evident when discussing the "AHA!" moments associated with making connections to theoretical curriculum and clinical practice (past, present, and future), and when asking them about how they prefer to learn. This is consistent with current

simulation literature that demonstrates a high degree of learner satisfaction in primarily university-level nursing students (Bashaw et al., 2016; Liaw et al., 2014; Liu et al., 2021; Lucktar-Flude et al., 2015; Merrimen et al., 2014; Staynt et al., 2015). Small et al. (2018) also note similar qualitative findings in university-level nursing students who report feeling more prepared for clinical practice and describe wanting more simulation experiences.

The findings within the *connections* theme demonstrate that PN students learn by making connections to theoretical knowledge and their clinical experience, and by applying this to future clinical practice. Consistent with simulation literature and nursing education literature, the simulation facilitator has an important role in facilitating these connections (Carless-Kane & Nowell, 2023; Decker et al., 2013; INACSL Standards Committee et al., 2021a; INACSL Standards Committee et al., 2021b; Verkuyl et al., 2018). The simulation facilitator should have the skills to support learners in meeting intended learning outcomes before, during, and after the SBLE (INACSL Standards Committee et al., 2021c). The data emphasizes that varying levels of scaffolded support are required for each individual learner depending on previous experience and approach to preparing for the SBLE. Further, while making connections increases PN students' perceived self-confidence and self-efficacy in recognizing and responding to a deteriorating patient, direct implications to the clinical setting were not measured. In addition, there is evidence that exposure to one deteriorating patient in simulation may not be adequate in supporting all PN students in recognizing and responding to a deteriorating patient in the clinical setting. Based on these findings, further research is needed to determine if repetitive exposure to deteriorating patient simulations improves the ability to recognize and respond to this clinical situation in both simulated and real-world environments.

Shared Knowledge

The results of this study indicate that not only does learning occur when individual participants make connections to theory and practice, learning also occurs from the connections between the participants, the simulated participant and the simulation facilitator. The data demonstrates that learning is experienced differently between learners who enact the simulation as a group, and learners who enact the simulation independently. In this research, the independent learner learned through reflection and communication with their simulation facilitator, however, the data showed that this learning was more didactic in nature. Whereas leaners who enacted the simulation as a group used words that are more collaborative in nature to describe the learning. Per the data, when simulation is enacted as a group, it also provides an opportunity to gain a better understanding of their role as a member of the group. The subthemes within the shared knowledge theme will be discussed in the context of the literature.

Participants Shape the Learning Outcomes

In simulation, learning occurs when conceptual knowledge and experiences are integrated through meaningful reflection (INACSL Standards Committee et al., 2021a). While reflection typically occurs during the debriefing phase (INACSL Standards Committee et al.), the data in this research described that enacting the simulation as a group promotes learning from others at all points of the SBLE: the prebrief, the simulation enactment, and the debrief. PN students described that their experience learning was deepened when conceptual knowledge and personal experiences of the other participants, their facilitator, and the simulated participant were incorporated into the SBLE. The learning experience was guided by the conversations that were initiated by the individual participants. Therefore, it can be deduced that the same learning experience would not necessarily be replicated with a different group of students or by another

learner enacting the simulation alone. Further, data from the participant who enacted the simulation independently, used more passive words to describe the learning experience. This indicates that the experience may be more didactic than collaborative in nature for independent learners.

The impact of team-based learning in nursing simulation is associated with increased knowledge and teamwork (Roh et al., 2020), an improved sense of safety (El-Hussein & Harvey, 2023), and improved perception of the individual learning process (Mestre et al., 2022). However, these studies look solely at team-based interventions and do not compare their findings to individual prebriefing, enactment, and debriefing. One study that compares individual versus collaborative pair enactment of a virtual reality simulation found that pairs outperformed those working individually (Edwards et al., 2023). In a systematic review and meta-analysis of the literature, Au and colleagues (2023) conclude that high-fidelity simulation group size should be limited to under six to be effective in developing knowledge and skills. However, the smallest groups included in this systematic review were groups of two. Notably, there appears to be a gap in the literature that compares self- vs group-enactment in an in-person SBLE and its impact on learning.

Some participants in this research study believed there would be benefit in enacting the simulation as a group, as well as independently. No current literature describes the actual experience of learning independently in a high-fidelity simulation. This would be worthwhile to explore given that literature related to virtual gaming simulations does describe some perceived advantages to independent enactment depending on the scenario (Verkuyl et al., 2022). In addition, independent enactment may provide learners with a clearer picture of their own knowledge base.

Working as a Team

This research finds that participants who enacted the simulation as a group, identified *learning to work as a team* as a learning outcome of the SBLE. This is described as both a challenging and rewarding experience, which is consistent with findings in university-level nursing students (Bashaw et al., 2016; Bogassian et al., 2014; Small et al., 2018). The data also reveals that it can be challenging to the learner to balance individual performance while sharing the learning experience with peers in simulation; learners are expected to play the role of the PN student responding to a deteriorating patient, and they are also expected to balance this with playing the role of a student learning as a group, sharing the learning experience with their peers. This is evident in Dolly's data when she shared that she found it hard to act quickly in the simulation. This was not because she did not know what to do. It was because she did not want to take away from the learning experience of others by identifying the issue too quickly. So, she waited. In the end, she felt this hesitation impacted her performance in the simulation. This finding indicates that performance in group simulation may not equate to how a learner would perform in independent enactment of a simulation or in the clinical setting. Comfort with role playing has been previously identified as a factor that influences the simulation experience (Lẽsa et al., 2021). Lẽsa et al. found that the degree to which a student is comfortable acting or role playing in a group impacts their experience. Data from this study reinforces Lẽsa et al.'s findings, but also provides insight that comfort with role-playing and balancing dual roles may also affect performance.

Lesa et al. (2021) also describes that the personalities of other learners may impact the simulation experience. This is evident in this research's data when Matthew described taking on an observatory role in the simulation because the participants with whom he is sharing the

learning experience with took on a more assertive approach. While individual personalities and team cohesiveness have been described as influential to decision-making in a deteriorating patient simulation (Bucknall et al., 2016), the impact of shared learning experiences on individual performance appears to be a gap in current simulation literature and worthy of further exploration.

The findings noted within the *shared knowledge* theme demonstrate that group size, composition, and group cohesiveness impact PN students' experiences learning in a deteriorating patient simulation. Engagement with peers and the simulation facilitator influence what is learned and how it is learned. Playing dual roles in group enactment of a simulation also impacts the learning experience and likely impacts performance. Because of the influence that the group members have on simulation prebrief, enactment, and debrief, it is reasonable to assume that independent enactment is a different experience altogether. Further exploration of this is recommended.

Importance of the Simulation Facilitator

The importance of the simulation facilitator was evident in all aspects of the SBLE. Firstly, the simulation facilitator played an important role in the resolution of stress. They accomplished this by 1) establishing a psychologically safe environment, 2) playing an active role in the simulation, 3) supporting the participants to meet the intended outcomes of the simulation, and 4) facilitating an effective debrief. Additionally, as previously discussed, the simulation facilitator could be leveraged to pre-emptively decrease stress by ensuring a shared mental model is established during the prebriefing period.

The simulation facilitator was imperative in supporting participants to make connections between theory and the SBLE, and the SBLE and practice. While participants with previous

experience were able to make these connections more readily, there was evidence in all participants' data that the simulation facilitator deepened their understanding and facilitated the sharing of knowledge. These findings are consistent with literature by Solli et al. (2022) who describe the three primary actions of the simulation facilitator in BN students' SBLEs: 1) emotional influence, 2) practical support, and 3) guiding communication. While Solli's research did identify that the facilitator may have a positive or negative influence on emotions, the data in this research study demonstrates only a positive impact on the experience. These conflicting results suggest that there may be traits of the simulation facilitator or learners that influence the perception of the simulation facilitator's impact on emotions. Additionally, the complexity of the simulation or its cognitive load may dictate the learner's perception of the role of the simulation facilitator.

Scaffolding

Scaffolding is the instructional approach of providing individualized support to learners when the learning outcomes may not be able to be achieved independently (Coffman et al., 2023). This research study employed scaffolded support to ensure participants met the intended learning outcomes of the simulation. Scaffolding was performed by the simulation facilitator. It was achieved during the enactment of the simulation when the simulation facilitator played the role of the clinical instructor, and during the debriefing period when the simulation facilitator supported the participants in making theoretical connections and connections to clinical practice. This scaffolding was learner-driven, meaning that the learners dictated when and how much support was required. This was an intentional choice to decrease cognitive load and facilitate psychological safety. Additionally, it more accurately depicted the role of the PN student in

clinical practice who would call and report to their clinical instructor for support in the event of patient deterioration.

In this study, the data demonstrated scaffolding to be an overwhelmingly positive component of simulation design. However, Solli et al. (2020, 2022) describe a delicate balance between active and passive facilitation among BN students. Acknowledging the diversity in learners' needs, Solli et al. emphasize the important, yet complex role of the simulation facilitator in assessing each learner's dynamic needs throughout the course of the SBLE. The data in this research adds that the level of support required may not be consistently driven by the learners' stage within the nursing curriculum. It was also influenced by previous clinical experience, work experience, self-directed learning strategies, and the impact of stress on cognitive load. While data in this research found that all participants perceived the facilitator's role to be a positive influence on learning, it was evident in the data that some participants in this study did not need as much support as others. This highlights the importance (and complexity) of the simulation facilitator's role in assessing the dynamic needs of a diverse group of learners to determine the appropriate amount of support or scaffolding required to optimize the learning experience.

Implications

This research introduces the experience of PN students learning in a deteriorating patient simulation. Analyzing their experience demonstrates that learning in a deteriorating patient simulation is a stressful yet meaningful learning experience. All participants perceive that the experience provides a realistic learning opportunity that mimics the emotions, actions, and consequences of encountering a deteriorating patient in the clinical setting. Participants also perceive that the simulation will improve their ability to recognize and respond to a deteriorating

patient in a clinical setting in the future. In addition, it provides an opportunity for self-assessment of nursing skills and abilities in the present. Exploring the participants' experiences idiographically demonstrates the uniqueness of each individual learner and the influences on their learning. The experience of learning is impacted by how the learners prepare for the simulation, their previous experiences, and by the group of learners themselves. Furthermore, and arguably most importantly, facilitation of the simulation, impacts the experience of learning. This underscores the importance of the role of the simulation facilitator. These findings have implications for nursing education, clinical practice, and nursing research.

Implications for Nursing Education

This research has significant implications for nursing education as it identifies that PN students may not have the ability to recognize and respond to a deteriorating patient independently. This emphasizes the need to identify opportunities to improve this ability to safeguard patients. This study proposes that deteriorating patient simulations can be implemented effectively to support PN students' professional practice. Although stressful, they are perceived to be a meaningful learning experience and participants felt motivated to learn using SBLEs. Additionally, they are perceived by learners to improve the ability to recognize clinical deterioration, thereby offering a potential solution to this patient-safety issue.

Nursing educators and stakeholders can learn from this research, recognizing that successful implementation of simulation hinges on effective simulation design and facilitation. This involves planning SBLEs that are tailored to the individual learners and may include providing additional support to individual learners as indicated. Although many educators may be inspired to implement SBLEs to support students in recognizing and responding to a deteriorating patient, it is imperative that these are designed and implemented with the support of

an educator experienced in simulation to ensure optimal cognitive load and psychological safety. In addition, the effectiveness of the simulation facilitator is integral to establishing a psychologically safe environment and supporting the students in achieving the intended learning outcomes. This role should therefore be reserved for experienced simulation facilitators. Simulation facilitators should use strategies such as coaching, offering scaffolded support, and creating a psychologically safe learning environment before, during and after the simulation to reduce stress and help participants achieve learning goals.

Additionally, the research reveals that a lack of shared understanding during the prebrief phase can increase pre-simulation stress for some learners. This is likely influenced by varying levels of self-directed learning skills and clinical experience. It is important for simulation educators to be aware that not all learners have the same self-directed learning strategies to prepare for the SBLE independently. Furthermore, preparedness may be impacted by their clinical experience, or lack thereof. To optimize cognitive load and decrease stress associated with a deteriorating patient simulation, PN student participants must be supported by an experienced simulation facilitator who assumes the role of facilitating a shared prebrief, ensuring individual participant readiness for simulation, and assessing for resolution of stress and achievement of learning outcomes after the SBLE.

Implications for Clinical Practice

This research study finds that most PN students did not have the ability to recognize and respond to a deteriorating patient in a SBLE without the support of the simulation facilitator, or their peers. This finding should be concerning for PN students, nurse educators, and community partners as it underscores potential implications for patient safety. It suggests that the incidence of failure to respond will continue to be a risk to patient safety unless effective strategies are

implemented to improve this capability. This is important for clinical instructors and preceptors to be aware of as PN students, even those approaching the end of their education, may not be able to recognize and respond to clinical deterioration in clinical practice and should therefore not be expected to do so independently. Further, the literature review provided insight that this may be true for new graduate nurses as well. Patient safety will continue to be compromised if signs of clinical deterioration are overlooked in clinical practice. This could result in increased morbidity or mortality for patients, and psychological harm to the PN student. This finding highlights the importance of the clinical instructor or preceptor in mentoring students to support practice gaps and overseeing practice to promote patient safety. Further, it offers an opportunity for clinical instructors to seek out opportunities to educate PN students about clinical deterioration in the context of promoting patient safety.

Importantly, this research offers that all PN participants described increased self-confidence and self-efficacy after participating in this SBLE. This illustrates SBLEs potential as an effective learning experience that PN students are likely to engage with. However, although all PN participants felt that this SBLE would translate to clinical practice, there is evidence in the data that not all participants had mastered the ability to recognize and respond to clinical deterioration by the end of a single SBLE. Subsequently, it is important to assess translation to the clinical setting to determine impact on practice and patient safety. Additionally, it would be valuable to determine if strategies that are effective in improving RN students' ability to recognize and respond to clinical deterioration in simulation, such as repetition of SBLEs, are effective for PN students as well.

Implications to Research

As previously demonstrated in the literature review, PNs and PN students are underrepresented in simulation research, and research activities in general (Snobelen, 2021). This research answers the call of WeRPN, the Registered Practical Nurses Association of Ontario, to create a broader body of knowledge by encouraging representation of PNs in research and demonstrating the impact of PNs on the health system (Snobelen). This is important because PNs represent 30% of the number of CNO registrants in Ontario (CNO, 2024) and nursing educators should want to know more about their experiences. Understanding their experience can help identify needs, priorities, and preferences, as well as gaps in current literature.

This research has identified the important role that PNs have in recognizing and responding to patient deterioration. It has also explored the experience of PN students to gain a deeper understanding of perceived implications to clinical practice, and to identify what impacts the experience of learning in a deteriorating patient simulation. The research determined that SBLEs are perceived to support the ability to recognize and respond to a deteriorating patient and are therefore a meaningful learning experience for PN students. The knowledge gained about what impacts learning can be leveraged and applied to simulation design, facilitation, and debriefing to support PN students in developing their ability to recognize and respond to clinical deterioration in the clinical setting, and thereby ultimately improving patient outcomes. This research also describes additional opportunities to broaden the body of knowledge about PN students and simulation.

Recommendations

It is important to first iterate the recommendations that address safety in the clinical setting. As described, some PN students may not have the ability to recognize and respond to

clinical deterioration independently. Clinical instructors, preceptors, and nurse educators in the clinical setting should be aware of this knowledge gap. They should provide a level of oversight and support that prevents patient harm, while promoting practice growth and development. Further, clinical instructors and preceptors should look for opportunities in the clinical setting that support PN students in developing their ability to address clinical deterioration.

Through understanding the experience of PN students learning in a deteriorating patient simulation, the following recommendations are strongly encouraged to enhance the learning experience. Firstly, the simulation should be designed and facilitated in alignment with HSSOBP™. An experienced simulation facilitator should be appointed to facilitate the simulation. The simulation facilitator should take responsibility for facilitating an informed prebrief which includes establishment of a shared understanding of the simulation. To optimize cognitive load thereby decreasing anxiety, I recommend that the simulation facilitator gauge individual readiness for the simulation, offering scaffolded support as necessary to ensure preparedness. With the awareness that not all PN students can recognize and respond to a deteriorating patient independently, the simulation facilitator should observe the simulation and offer support as necessary during enactment to support the PN students to be successful in the simulation. In this simulation, this was achieved by having the facilitator play the role of the clinical instructor, modelling appropriate actions as necessary. After the simulation, a debrief that aligns with HSSOBP™ should be facilitated to ensure the resolution of stress and achievement of learning outcomes, again determining the individual needs of the PN students. Finally, I recommend that deteriorating patient simulations continue to be explored to identify simulation design factors that strengthen the learning experience, such as repetition and preparing synchronously as a group.

Future Research

As previously described, future research should aim to explore whether perceived self-confidence and self-efficacy in responding to a deteriorating patient simulation translate to clinical practice. Such future research should consider both the students' perspectives and the impact on patient safety outcomes. Additionally, it would be valuable to assess if interventions that have proven effective for university-level nursing students can also support PN students. Specifically, practices such as repeated SBLEs, preparing with a community of learners, deconstruction of the case in the prebrief, and using virtual gaming simulations to prepare could be evaluated for their effectiveness in enhancing PN students' preparedness for real-world scenarios.

This research also identifies gaps in the research related to independent vs group enactment in a deteriorating patient simulation, role composition, and role conflict when PN students are learning as a group in simulation. These areas should be further explored with future research as this was not the explicit focus of this study and were therefore not examined in depth. Future research should aim to understand how PN students perceive their role as a learner who shares a learning experience with their peers. This may provide insight into decision-making, learning outcomes, and actions taken in the SBLE.

Limitations

As a novice researcher, I must acknowledge that my limited experience conducting interviews may have affected the data collected from the participants. In transcribing the results section of this research, I identified several opportunities where follow-up questions may have enriched the quality of the data, thereby deepening the understanding of the experience of PN students learning in a deteriorating patient simulation. Furthermore, as a novice researcher

practicing interpretative phenomenological analysis (IPA) for the first time, interpretation of the data may also be underdeveloped in comparison to experienced IPA researchers.

Another significant limitation of this study is that I conducted this research study at my place of employment where I am a professor to nursing students that were potential participants in this study. To minimize the impact of this on my research findings, I declined teaching contracts for semester three and semester four nursing courses (the specified population) at the time of the research study. Additionally, I had a third party, their coordinator, provide details about the research study to the students. As a graduate student completing my Master of Nursing while working full-time, it was not possible for me to step away from my career for the purpose of the project. Given that IPA research employs double hermeneutics, my experience teaching nursing students was leveraged to assist me in the research design and interpreting responses, and I reflected on the influence of my interpretation as previously mentioned.

This research initially intended to have participants enact the simulation in pairs. However, due to organizational constraints, simulations were offered on two separate days to maximize the number of participants in the study. Because of this, there were an uneven number of participants on each simulation day. The decision was made to provide participants with the option to enact the simulation as a group of three or independently. Three participants enacted the simulation as a small group; one participant enacted the simulation independently. Allowing participants the option to choose to enact the simulation as a group prioritized psychological safety and ethical research. However, because the simulation was enacted with one group of three participants and another with a single participant, the experience was not identical in design. This likely impacted their perception of the experience and influenced the research results.

Finally, given that the SBLE was offered in addition to the PN curriculum, the research study likely recruited participants with an affinity for simulation. This was helpful in recruiting a homogenous sample which aligns with IPA research. However, it may limit the transferability of some of the findings.

Chapter Summary

This chapter situates the results of this research study within the current simulation literature which is predominantly in the context of university-level nursing students. The discussion shares that PN students, like university-level nursing students, believe learning in a deteriorating patient simulation is a meaningful, although stressful, learning experience. Consistent with university-level nursing students, PN students may not have the ability to recognize and respond to a deteriorating patient in simulation. However, akin to university-level nursing students, PN students report an increase in confidence and self-efficacy after the deteriorating patient SBLE. This study finds that PN students learn by making connections to theory, previous clinical experience, and future clinical practice. The ability to make these connections is influenced by their peers, the simulated participant, and the facilitator, as well as their previous clinical experience and their preparation prior to the SBLE. Strategies for scaffolding support to improve the experience of learning in simulation are proposed. These strategies should be explored for efficacy in the context of PN SBLEs, and to identify whether perceived self-confidence and self-efficacy in responding to a deteriorating patient simulation translate to the clinical setting. These findings have implication for nursing education, clinical practice, and nursing research.

Chapter 6. Conclusion

This research is driven by a sense of commitment to improve patient outcomes and support nursing students to recognize and respond to a deteriorating patient. Recognizing the gap in literature related to PN students learning in simulation, interpretative phenomenological analysis was used to facilitate a detailed understanding of the experience of PN students learning in a deteriorating patient simulation. The findings explore the essence of the learning experience, details about what impacts learning, and implications to clinical practice.

This research describes learning in a deteriorating patient simulation as a stressful yet meaningful experience for PN students. However, with effective facilitation, this stress was reported as tolerable and believed to be important to learning. The stress experienced in deteriorating patient simulations happened predominantly before and during enactment of the simulation. Most notably, stress was a result of feeling unprepared, simulation fidelity, and a sense of responsibility for the patient. Stress resolved by making correct decisions and taking effective action in the simulation. For some learners, this may require scaffolded support from their peers or the simulation facilitator. In addition, it is imperative that a safe learning environment is fostered; an environment in which learners feel permitted to learn and make mistakes.

Learning in a deteriorating patient simulation is impacted by several factors. Firstly, the individual learners themselves. The learners' self-directed learning strategies influenced preparedness for the simulation. Actual and perceived preparedness for the simulation impacted both performance and stress before and during the simulation. Further, this research finds that the ability to make connections between theory, the simulation, and clinical practice was impacted by previous clinical experience. Learners with previous work experience in the clinical setting

were able to make these connections more readily. Whereas those with less experience required support from the facilitator or their peers. Learners also reported learning from the group. How and what they learn from the group was impacted by the group composition, including group size and individual group members. These factors may also influence performance in the simulation.

The simulation facilitator is another influential element that impacts the process of learning. Facilitators can be leveraged to offer scaffolded support to be successful during simulation enactment, and to support the students in making connections between theory and practice in the debrief discussion. They are essential to the resolution of stress, and results indicate that there is benefit to the simulation facilitator playing an active role in cueing learners during enactment of the simulation. Additionally, the data infers that there would be benefit to the simulation facilitator playing a more active role in facilitating the prebrief and ensuring readiness for the SBLE prior to the simulation to optimize cognitive load.

The findings of this study have implications to clinical practice. As noted, PN students may not have the ability to recognize and respond to a deteriorating patient independently, reinforcing this ongoing risk to patients that needs to be addressed. Clinical instructors, preceptors, and mentors should be aware of, and provide scaffolded support to bridge this gap in the clinical environment. This research demonstrates that deteriorating patient simulations have positive implications to clinical practice; they are perceived by the learners to increase confidence and self-efficacy. Further, they may support awareness of one's own reaction when faced with a stressful event in a simulated clinical environment. Therefore, deteriorating patient SBLEs show promise in preparing PN students to recognize and respond to a deteriorating patient in simulation, though actual impact to clinical practice was not evaluated in this research and is recommended for future research.

In conclusion, PN students like BScN students may not have the ability to recognize and respond to a deteriorating patient. However, when scaffolded support is provided and a psychologically safe environment is fostered, deteriorating patient simulations, although stressful, may be used to support PN students to connect theoretical knowledge to the clinical environment. This is perceived by PN students to develop their ability to recognize and respond to patient deterioration in the clinical setting. Therefore, based on the findings in this research, it is recommended that deteriorating patient SBLEs be incorporated into the PN curriculum in a well-supported and rigorously facilitated manner to enhance professional development. Deteriorating patient simulations have the potential to improve the ability to recognize and respond to patient deterioration which may lead to faster recognition and response in the clinical setting. Faster recognition and response to clinical deterioration will ultimately improve patient outcomes.

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Appendix A

Data Analysis and Presentation

Author/Year/ Country/Aim	Study Design/ Participants	Simulation Method	Outcome & Measurements	Results	Key Findings
Bashaw et al. (2016) United States To determine the experience of nursing students in a peri-operative deteriorating patient (DP) HFS.	Qualitative. 9 third-year undergraduate nursing students.	A HFS in the OR with faculty acting as the surgeon. Students responded to a deteriorating patient (DP) with malignant hyperthermia.	The debrief responses were evaluated by faculty to identify key themes. Faculty reported key themes reported by the students.	• HFS with the faculty in the role of the surgeon allows faculty the opportunity to assess students in simulation • Students felt the experience was a positive learning experience • Role clarification in peri-operative emergencies is essential	A peri-operative HFS r/t a DP was found to be a positive learning experience for students.
Bogossian et al. (2014) Australia To identify the characteristics that may predict outcome of clinical performance, teamwork, and situation awareness in a HFS related to a DP.	Mixed methods. 97 final-year BScN students from 3 universities.	HFS with an SP experiencing sudden deterioration. Simulation was video recorded with prebrief and debrief using photo-elicitation.	The simulation was evaluated using an OSCE checklist, Team Emergency Assessment Measure and Situational Awareness Global Assessment Technique.	• Only 1% of students passed the OSCE • The average score using the TEAM checklist was 38% • The average score using the SAGAT was 41%	Students' performance with a DP HFS yielded that students may not have the pre-requisite knowledge and ability to respond to a DP independently or with a team of peers.

Author/Year/ Country/Aim	Study Design/ Participants	Simulation Method	Outcome & Measurements	Results	Key Findings
Bucknall et al. (2016) Australia To examine the decision-making of nursing students during team-based patient deterioration simulations.	Descriptive exploratory using cued recall during video review. 97 final year nursing students at 3 universities.	Each team of 3 students participated in 3 8-minute simulations (related to cardiac, shock, respiratory) with an SP. Audio and video were recorded for cued recall afterwards.	Descriptive model for qualitative research was used to focus on the process of decision-making.	• 11 difference types of decision types evident • Decision types (below) are consistent with RN and NP decision-making • Information seeking, patient assessment, diagnostic, intervention/treatment, evaluation, escalation, prediction, planning, collaboration, communication, reflective	In DP simulation, nursing students are influenced by patient characteristics, individual and team knowledge and the context of the situation to guide their decisions.
Chadwick & Withnall (2016) United Kingdom To determine whether a high-fidelity human patient simulation is effective in developing mental health student nurses' confidence in recognizing and responding to a DP.	Quantitative – survey 95 third-year mental health nursing students	Students were assigned to participate in a high-fidelity human based simulation related to a MH patient experiencing deterioration.	Pre and post-test questionnaires were administered to assess students' perceived level of confidence using a likert scale after the intervention.	• 90% of participants felt their confidence had improved after the intervention • The majority of participants indicated they felt moderately and highly confident after the intervention • Students level of confidence was highest related to the ability to "handle whatever happens…"	High-fidelity human-based simulation helps to increase mental health nursing students' perceived confidence when a mental health patient experiences sudden physical deterioration.

Author/Year/ Country/Aim	Study Design/ Participants	Simulation Method	Outcome & Measurements	Results	Key Findings
Dix et al. (2021) Australia To explore final year nursing students' ability to transfer clinical judgement skills to clinical practice setting following immersive simulation.	Qualitative semi-structured interview using natural philosophical approach to data collection. Six undergraduate nursing students. Four clinical nurse educators.	Students participated in an immersive high fidelity simulation r/t a deteriorating post-operative patient and a patient with a pulmonary embolism. Their role was to portray a newly graduated nurse. The simulation lasted 15-25 min.	Semi-structured interview questions focused on clinical judgement in simulation and impact on clinical judgement in clinical placement.	• Students identified four key connections between the simulation and clinical practice • Safely collecting data, understanding that data, increased emotional intelligence, and challenges in roles because they were asked to act out of their scope in the simulation.	Immersive high-fidelity simulations contribute to students feeling more prepared to recognize and respond to a DP in clinical practice.
Goldsworthy et al. (2019) Canada To determine the effect of a hybrid simulation intervention on nursing students' confidence and competency in recognizing and responding to patient deterioration.	Quasi-experimental pre- and post-test study. 59 third-year B.N. students were assigned to either a treatment or control group.	The experimental group participated in two 8-hour clinical simulation days where they practiced responding to DPs (adult and paediatric patients) over six different scenarios. The scenarios were repeated two weeks later. Students also completed 2 virtual simulations related to a deteriorating patient with the 2 week time frame.	Pre- and post-tests: clinical self-efficacy survey and a knowledge test.	• Students perceived self-efficacy demonstrated statistically significant improvement with the intervention • Students' knowledge increased related to responding to an MI, septic shock and asthma • The virtual simulations focused on MI and asthma	The simulation intervention demonstrated that student self-efficacy increased and students' knowledge related to paediatric asthma, responding to a myocardial infarction and recognition and response to septic shock improved.

Author/Year/ Country/Aim	Study Design/ Participants	Simulation Method	Outcome & Measurements	Results	Key Findings
Goldsworthy et al. (2022) Canada, Australia, England, Scotland To explore the impact of a DP virtual simulation on undergraduate nursing students' ability to recognize and respond to a DP.	Mixed methods study; quasi-experimental pre/post design and focus groups. 88 third or final year undergraduate nursing students from 4 different counties.	Students completed six virtual simulations r/t DP over a three-week period. Students were provided with debriefs after each simulation.	Clinical self-efficacy scale, 20 question multiple choice knowledge test (pre- and post-), qualitative data gathered from focus groups.	• The experimental group had statistically significant increased level of clinical self-efficacy and knowledge from pre- to post- test. • Students felt more confident and that repetition helped to dec. stress and increase performance in clinical practice	Repetition of DP virtual simulations were shown to increase self-efficacy and knowledge, and students believed the repetition allowed them to feel more confident in clinical practice.
Hart et al. (2014) United States To evaluate the effectiveness of a structured education curriculum with simulation in improving BScN students' ability to recognize and respond to a DP.	A quasi-experimental, repeated measures study. 48 BSN students enrolled in an elective course titled "Acute Patient Deterioration."	The course involved lecture, repeated simulations with video review and debriefing.	• Videos were reviewed using the Emergency Response Performance Tool and the Patient Outcome Tool.	• Significant improvement in Response Performance time when comparing pre- to post-invention scores • Significant improvement in Patient Outcome measurement tool when comparing pre to post-intervention scores	A simulation course designed to support the recognition and response to acute patient deterioration improved the response times and patient outcome measures in BScN students.
Ignacio et al. (2015) Singapore To compare the effects of using	A mixed method randomized controlled trial (RCT) with pre	Students were randomly assigned to participate in a DP simulation	• Pre- and post test used the Rescuing a Patient in Deteriorating	• No significant difference in performance using RAPIDS assessment tool between groups	DP simulations with either a HFS or an SP are an effective tool for helping students prepare for the stress of recognizing and

Author/Year/ Country/Aim	Study Design/ Participants	Simulation Method	Outcome & Measurements	Results	Key Findings
(Ignacio et al. cont'd) simulated participants (SPs) vs high fidelity simulators (HFS) on student nurses' stress levels and performance, and their perspective of the modalities within deteriorating patient (DP) simulations.	and post-test objective measures as well as post-test qualitative findings. 57 third year university nursing students.	with either a high-fidelity simulator or an SP.	Situations (RAPIDS) tool. • Salivary amylase (a biomarker for SNS activity) was measured pre- and post-test Focus group discussions 9 weeks after simulation	• No significant difference in post-test salivary amylase biomarkers between two groups • Students felt stress in the simulation better prepared them for managing a DP in the clinical setting (SP > HFS) • Working with an SP better prepared them to deal with the emotional stress of a DP • Prioritize realism regardless of modality	responding to a DP in clinical practice. An SP may better prepare students to deal with the emotional stress associated with a DP. The modality should be chosen based on realism.
Kelly et al. (2014) Australia To assess the impact of DP simulation experiences on students' technical and communication skills and to determine whether there is a difference in benefit to different studies of program.	Pre- and post-test survey. 57 final year nursing students; included 3-year BN program, 2-year Enrolled Nurse program, and 2-year Graduate Entry).	Students were assigned to participate in a HFS with a manikin. They participated in one as the observer in in the other as an active participant.	• Pre- and post-intervention survey evaluated self-efficacy, response to a DP, communication, and teamwork.	• Overall, all students felt more positive about their ability to recognize and respond to a DP • Students self-reported an increase in the ability to recognize a DP • Some increase in confidence to approach some members of the interprofessional team	Students, irrespective of the program they are enrolled in, benefit from participating in a deteriorating patient simulation.

Author/Year/ Country/Aim	Study Design/ Participants	Simulation Method	Outcome & Measurements	Results	Key Findings
Liaw et al. (2014) Singapore To compare the efficacy of a virtual simulation vs a patient simulation in efficacy.	Randomized, controlled trial (RCT) with pre- and post-test design. 57 third-year university nursing students.	Students were randomly assigned to participate in a 2 hour DP simulation session in groups of 6 (control group) or a virtual patient simulation which lasted approximately 2 hours.	• Pre-test using a simulation-based manikin and 2 post-tests using simulation-based manikin (1-2 days after and 2.5 months after). • Survey to evaluate learning experience.	• Post-test scores increased for both groups 1-2 days after test; experimental more than the control group; • Post-test scores for the experimental group decreased significantly for experimental group, but not significantly for control group. • Post-test scores for both experimental and control scores at two months were not significantly different • Students were highly satisfied with the virtual simulation experience	Both the virtual simulation and the manikin-based simulation are effective in teaching nursing students how to recognize and respond to a deteriorating patient. Students who participated in the virtual simulation had a significantly higher increase in post-test scores but at 2.5 months after, both groups had similar test scores.
Liu et al. (2021). China To determine the effectiveness of a community of learning on nursing students' learning gains in a sudden patient deterioration model.	Pre- and post-test design. 233 fourth-semester nursing students in a four-year baccalaureate nursing program.	Students were randomly assigned to either a face to face lecture with lab practice with DP simulation (control) or a self-directed group learning module with virtual case studies, learning group discussions and then lab practice with DP simulation (experimental).	• Student Assessment of Learning Gains (SALG)survey • Post-test test questions • Comprehensive experimental evaluation checklist to assess practical ability	• SALG scores were higher in experimental group • Experimental group had slightly higher scores on the post-test test questions (not significant amount) • Experimental group performed better than the Control group in the practical skills test	A preparation model designed with a COI design may support nursing students in being able to recognize and respond to a DP

Author/Year/ Country/Aim	Study Design/ Participants	Simulation Method	Outcome & Measurements	Results	Key Findings
Lucktar-Flude et al. (2015) Canada To describe learner experience, confidence, knowledge and performance of assessments and interventions for the unresponsive patient.	Cross-sectional study. 239 2nd, 3rd, and 4th year nursing students in a four-year BScN program.	Four simulations were introduced into the 2nd year health assessment course which focused on assessment and response to a DP r/t narcotic overdose, witnessed and unwitnessed cardiac arrest, and hypoglycemia.	• Self-confidence scale • Critical Behaviour Problem Checklist • Satisfaction Scale • Experience Scale	• Knowledge scores increased for 2nd year nursing students • Performance times, although were still underdeveloped, increased across all semesters • Students were satisfied with the learning experience and felt their knowledge skill and confidence when recognizing and responding to a deteriorating patient improved	Repetitive exposure to unresponsive and/or DP simulations is needed to support mastery of response to these situations. 2nd year nursing students' knowledge increased after introduction of these simulations in their year two health assessment course.
McKenna et al. (2014) Australia To explore nursing students' situation awareness while engaging in simulated patient deterioration scenarios.	Mixed methods. 97 third-year nursing students in the undergraduate nursing program at 3 Australian universities.	Three HFS with SPs experiencing acute deterioration were participated in and video recorded.	• Pre- and post-test knowledge questionnaire • Review of video • OSCE Evaluation • Team Emergency Assessment Measure • Situation Awareness Global Assessment Technique (these questions were asked in rapid succession immediately after the simulation)	• Only details of SAGAT were discussed • Overall, SA scores were low • Physiological perception was particularly low (what is the BP/HR/RR now?)	Final year nursing students may not have the situational awareness to recognize and respond to a deteriorating patient

Author/Year/ Country/Aim	Study Design/ Participants	Simulation Method	Outcome & Measurements	Results	Key Findings
Merriman et al. (2014) United Kingdom To determine whether simulation is more effective than didactic lecturing in teaching assessment skills required to recognize and respond to a deteriorating patient.	Randomized, controlled trial. 34 first-year undergraduate nursing students.	Students were randomly assigned to a 1-hour lecture on assessment of a DP or a 2-hour demonstration and simulation involving a DP using a HFM.	Pre- and post- OSCE checklist evaluation of the students responding to a DP in simulation, and self-reported confidence and self-efficacy questionnaire. Students were also asked to rate their level of satisfaction with the learning.	• Experimental group has higher post-test OSCE scores • Both control and experimental groups rated themselves similarly in the pre- and post-test self-efficacy and self-reported confidence questionnaires. • The experimental group were highly satisfied with their learning, compared to the control group.	Simulation is more effective than classroom-style teaching in teaching a student nurse how to recognize and respond to a deteriorating patient. It is also a preferred method of learning compared to classroom-style learning.
Mohammed (2020) Saudi Arabia To provide an in-depth analytic interpretation of an authentic simulation session to develop a more instructive understanding of simulation practices.	Discourse analysis. 54 undergraduate nursing students in Saudi Arabia enrolled in a critical care nursing course.	Students were put in to groups of nine. They participated in three scenarios back to back: primary survey, managing sudden hemodynamic changes, and managing cardiopulmonary arrest. The simulation lasted 25 minutes total.	Detailed analysis of one of the groups' simulation scenarios, focusing on communication and response.	• Lack of harmony among team members was noted • Lack of role understanding or assignment • Difficulty communicating with the deteriorating patient	As responding to a DP can be overwhelming and challenging for nursing students, it is recommended that faculty take an active role in briefing and participation in the simulation to avoid poor outcomes.

Author/Year/ Country/Aim	Study Design/ Participants	Simulation Method	Outcome & Measurements	Results	Key Findings
Sapiano et al. (2018) Malta To investigate the effectiveness of virtual simulation in improving student nurses' knowledge and performance during rapid patient deterioration.	Pre- and post-test design. 166 nursing students enrolled in either the 3 year diploma or 3 year B.N. program.	Students completed 3 virtual simulations related to a deterioration patient (cardiac, respiratory, shock).	A pre- and post-test was completed before and after to assess knowledge (11 question knowledge test). Performance during the simulation was also evaluated.	• Students performed better in the third scenario indicating that knowledge was transferred from one virtual simulation to the next • Overall, students' post-test scores were higher than their pre-test score demonstration learning growth	• Virtual simulations are an effective way for nursing students to learn how to recognize and respond to a deteriorating patient.
Small et al. (2018) Canada To learn about baccalaureate nursing students' lived experience of HFS of a pediatric cardiac arrest.	Phenomenol ogical qualitative research. 12 third year BN students enrolled in a clinical nursing course.	In groups of 3 or 4 nursing students, students participated in a HFS with a manikin where a pediatric patient developed anaphylactic shock which progressed to cardiac arrest.	24 interviews were conducted with 12 students. The first interview asked broad open-ended question. The second interview was to clarify points made in the first interview.	• The simulation was surprisingly realistic • The manikin's fidelity contributed to realism • Feel more prepared for clinical • Developed the art and science of nursing • Felt relief after mounting stress	• When simulation is implemented in alignment with best practices, HFS provide a realistic opportunity to teach recognition and response to a DP
Staynt et al. (2015) United Kingdom To determine the effectiveness of clinical simulation in improving the clinical performance of recognizing and managing a DP in hospital.	Randomized controlled trial. 98 first-year BSc Nursing students.	Students were assigned to the control group (which received a lecture on the DP) or the experimental group (which participated in a DP simulation). The exp. group received in-lab demonstration and practiced with a medium fidelity manikin.	Pre- and post- test OSCE, General Perceived Self-Efficacy and Self-Reported Competency, student evaluation of teaching	• Post-test OSCE scores were significantly higher for the intervention group compared to the control group • Both control and intervention group had similar increase in GPSEC scores • The intervention group was significantly more satisfied with their teaching	• Teaching recognition and response to a DP using simulation yields a significant increase in performance compared to traditional lecture-style teaching. Students are more satisfied using simulation as a teaching strategy.

Appendix B: Certification of Ethical Approval

Athabasca University

CERTIFICATION OF ETHICAL APPROVAL

The Athabasca University Research Ethics Board (REB) has reviewed and approved the research project noted below. The REB is constituted and operates in accordance with the current version of the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans (TCPS2) and Athabasca University Policy and Procedures.

Ethics File No.: 25634

Principal Investigator:
Ms. Melissa Sherrer, Graduate Student
Faculty of Health Disciplines\Master of Nursing-Generalist Program

Supervisor/Project Team:
Dr. Venise Bryan (Supervisor)

Project Title:
The Practical Nursing Student's Experience of Learning in a Deteriorating Patient Simulation

Effective Date: March 12, 2024 **Expiry Date**: March 11, 2025

Restrictions:

Any modification/amendment to the approved research must be submitted to the AUREB for approval prior to proceeding.

Any adverse event or incidental findings must be reported to the AUREB as soon as possible, for review.

Ethical approval is valid *for a period of one year*. An annual request for renewal must be submitted and approved by the above expiry date if a project is ongoing beyond one year.

An Ethics Final Report must be submitted when the research is complete *(i.e. all participant contact and data collection is concluded, no follow-up with participants is anticipated and findings have been made available/provided to participants (if applicable))* or the research is terminated.

Approved by: **Date: March 12, 2024**

Paul Jerry, Chair
Faculty of Health Disciplines, Departmental Ethics Review Committee

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Athabasca University Research Ethics Board
University Research Services Office
1 University Drive, Athabasca AB Canada T9S 3A3
E-mail rebsec@athabascau.ca
Telephone: 780.213.2033

Appendix C: Certification of Approval

March 21, 2024

Melissa Sherrer
Contract Faculty, Fleming College
School of Health & Community Services

Re: Submission to Fleming Research Ethics Board for Approval of Research Application

Dear Melissa,

The Fleming College Research Ethics Board (REB) received your application to do research involving humans and determined your application met the conditions for delegated review. The Chair has concluded with a decision of **Approved as Submitted.**

Title: "The Practical Nursing Student's Experience of Learning in a Deteriorating Patient Simulation."

Approval #20240321

This approval expires March 21, 2025. Should you require an extension please contact the REB one month prior to your approval expiration.

Upon conclusion of your project you are requested to complete the "End of Study" report form that is attached with this email. You will receive a confirmation email once this form is received by the REB.

Please note your responsibilities under section 6 of Fleming College's Policy 2-216 including that you are required to report any changes from your research protocol, any adverse events, any unforeseen harm, or any unanticipated risks or problems.

Best wishes in your research.

Sincerely,

Todd Hataley, Ph.D.
Chair, Research Ethics Board

Peterborough
599 Brealey Dr.
Peterborough, ON K9J 7B1
T. 705-749-5530
F. 705-749-5540

Lindsay
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T. 705-324-9144
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Haliburton
297 College Dr., Box 839
Haliburton, ON K0M 1S0
T. 705-457-1680
F. 705-457-2255

flemingcollege.ca

Appendix D: Letter of Support

November 9th, 2023.

To Whom it May Concern,

It is with great pleasure that I provide a letter of support for Melissa Sherrer, RN. Melissa's proposed research aligns with the priorities of the School of Health & Community Services and we are happy to provide access to our simulation resources for the purposes of Melissa conducting this research.

If you have any questions, please contact me directly.

Sincerely,

Nick Stone

Dean, School of Health and Community Services
Fleming College
599 Brealey Drive
Peterborough, Ontario
K9J 7B1

Email: nick.stone@flemingcollege.ca
Phone: 705 749 5530 x 1861

Appendix E: Recruitment Poster

Appendix F: Letter of Information and Consent

LETTER OF INFORMATION / INFORMED CONSENT FORM
Practical Nursing Students' Experience of Learning in a Deteriorating Patient Simulation

[Date]

Principal Investigator (Researcher):
Melissa Sherrer, RN, BScN, CHSE
MN Student
Athabasca University

melissa.sherrer@flemingcollege.ca
msherrer1@learn.athabascau.ca

Co-Supervisors:
Dr. Barbara Wilson-Keates, PhD, RN, CCSNE
BScN Faculty Instructor
Red Deer Polytechnic

barbara.wilson-keates@rdpolytech.ca

Dr. Venise Bryan, PhD, RN
Faculty of Health Disciplines
Athabasca University

vbryan@athabascau.ca

You are invited to take part in a research project entitled *'Practical Nursing Students' Experience of Learning in a Deteriorating Patient Simulation'.*

This form is part of the process of informed consent. The information presented should give you the basic idea of what this research is about and what your participation will involve, should you choose to participate. It also describes your right to withdraw from the project. In order to decide whether you wish to participate in this research project, you should understand enough about its risks, benefits and what it requires of you to be able to make an informed decision. This is the informed consent process. Take time to read this carefully as it is important that you understand the information given to you. Please contact the principal investigator, Melissa Sherrer, if you have any questions about the project or would like more information before you consent to participate.

It is entirely up to you whether or not you take part in this research. If you choose not to take part, or if you decide to withdraw from the research once it has started, there will be no negative consequences for you now, or in the future. Participation in this research will not affect your grade or progress in the program.

Introduction
My name is Melissa Sherrer and I am a Master of Nursing student at Athabasca University. As a requirement to complete my graduate degree, I am conducting a research project about the experience of learning when responding to a patient who is deteriorating in a simulated learning

environment. I want to understand the Practical Nursing students' perspective and learn from their experiences. I am conducting this project under the supervision of Dr. Barbara Wilson-Keates and Dr. Venise Bryan.

Why are you being asked to take part in this research project?
You are being invited to participate in this project because you are a Practical Nursing student at Fleming College, in a program that embeds simulation into the curriculum. You are an upper-level student (semester 3, or 4) and have some clinical experience in an acute care setting.

What is the purpose of this research project?
This research project intends to empower the voice of Practical Nursing students to gain a better understanding of the students' perspective of learning in simulation, and expand the literature related to Practical Nursing students learning with simulation. It is guided by the question, *what is the experience of Practical Nursing students learning in a deteriorating patient simulation?*

What will you be asked to do?
If you consent to participate in this research project, you will be asked to participate in a high-fidelity simulation-based learning experience, reflective practice, and a one-on-one semi-structured interview. An overview of each of these components is described below:

Simulation-Based Learning Experience (150 minutes)
The simulation-based learning experience will include preparation work, a prebrief immediately before the simulation, the simulation itself, and a group- and self-debrief. The group debrief will be facilitated by a simulation facilitator and is not part of the data collection. The simulation will be audio/video recorded and will be sent to you and your simulation partner(s) to review and reflect on after the simulation. The simulation-based learning experience including all of the aforementioned activities will take you approximately 150 minutes to complete.

Reflective Journal (20-120 minutes)
Throughout the learning experience, you are asked to journal your thoughts, feelings and emotions in an electronic reflective journal which will be shared with the researcher. You will be prompted at critical times during the research study to journal. You may also choose to create journal entries when thoughts about the experience cross your mind. Reflective journal entries may include items such as written work, poetry, images, doodles, memes, emojis, gifs, etc. Choosing creative methods which help you process the learning and your understanding of the learning are encouraged. As reflective journaling is very personal, it is challenging to estimate the length of time you will spend journaling. You will be encouraged to complete at least 4 journal entries. Each journal entry is estimated to take you between 5-30 minutes.

One-on-One Semi-Structured Interview (60-90 minutes)
Within one to two weeks after the simulation, you will be asked to participate in a virtual interview with the primary researcher. Please note, this interview is different from the debrief in that data will be collected from the interview. The interview will be arranged at a time that is convenient for you and is expected to take approximately 60-90 minutes. The interview will take place via Microsoft Teams as Teams is supported by both Athabasca University and Fleming

College. The interview will be audio and video recorded for accuracy. Audio will be transcribed using Microsoft Teams transcription. The primary researcher will review and revise the transcript for accuracy, describing the video as deemed pertinent. Although video recording can be helpful in qualitative research, if you are uncomfortable with a video recording, please indicate that in your consent.

Once the interview is transcribed, you will have the opportunity to review the transcript for accuracy and request changes or clarify your responses within 1 week.

What are the risks and benefits?
While simulation-based learning experiences strive to be a psychologically safe environment, the simulation content does address changing patient acuity and medical distress which may cause you to have unsettled feelings. To decrease the risk of potentially adverse effects, you may choose to stop the simulation at any time. You will also be offered the opportunity to debrief the simulation with a trained facilitator immediately following the simulation. Should you continue to have unsettled feelings after the simulation, you are encouraged to access the college-specific mental health resources.

The benefit of participating in this study is giving you the opportunity to make your voice heard by nursing education, simulation, and health care communities. Providing your lived experience through research can help create change, helping nurse educators and simulationists to better understand how to support nursing students as they near entry-to-practice. If you choose to participate in this research project, you will receive hours towards your co-curricular record (CCR). In addition, once the one-on-one semi-structured interview is complete, you will receive a $50.00 gift card to Walmart or No Frills. If you are unable to complete the interview for any reason, you will not be entitled to the gift card. However, once you have completed the interview, you will not be expected to return the gift card should you choose to withdraw from the study.

Do you have to take part in this project?
As stated earlier in this letter, involvement in this project is entirely voluntary. If you choose to participate, you are not obligated to answer any of the questions in the interview.

If you decide to withdraw your consent at any point, data collected up to that point will be discarded. However, it should be noted that given that the simulation and the debrief discussion occur in small groups, your contributions to those activities may be reflected in answers from other participants. Should you consent to take part in this research project and later withdraw your consent, this risk will be assumed.

You may choose to withdraw consent up until the point that data is anonymized. This will happen approximately 7 - 14 days after the one-on-one interview. To withdraw consent, you must contact the principal investigator with your written intent to withdraw from the study at one of the following email addresses: msherrer1@learn.athabascau.ca or melissa.sherrer@flemingcollege.ca.

Participants who do not complete the one-on-one interview will not be entitled to the [$50] reimbursement.

How will your privacy and confidentiality be protected?
The ethical duty of confidentiality includes safeguarding participants' identities, personal information, and data from unauthorized access, use or disclosure.

This study will use Microsoft Teams to collect data, which is an externally hosted cloud-based Canadian service. When information is transmitted over the internet privacy cannot be guaranteed. There is always a risk your responses may be intercepted by a third party (e.g., government agencies, hackers). Further, while the researcher(s) will not collect or use IP address or other information which could link your participation to your computer or electronic devices without informing you, there is a small risk with any platform such as this of data that is collected on external servers falling outside the control of the research team. If you are concerned about this, we would be happy to make alternative arrangements (where possible) for you to participate, perhaps via telephone. Please contact Melissa Sherrer for further information.

When you are participating in the simulation, a video of the simulation (including audio) will also be recorded. This is recorded and saved to cloud-based service that requires Fleming students to enter their single sign-on to review the video. Videos of your simulation are intended to be accessed only by you, and any other students that participate in the simulation at the same time as you do. The simulation operations technician will be responsible for recording the video and emailing you a password protected link to access the video. These videos are deleted by the simulation operations technician at the end of each institutional semester.

The one-on-one interview via Microsoft Teams will be restricted to you and will require a meeting access code that is only shared with you. Throughout the interview, the audio/video call application's safety features will be used in full to ensure that risks are minimal and to ensure your privacy is protected. The interview will be recorded using Microsoft Teams. Teams' transcription services will be used to generate a transcript. Once transcription is complete, you will have the opportunity to review the transcript for accuracy and request changes or clarify your responses within one week. After one week, the video will be deleted, and the transcript will be anonymized. To learn more about Microsoft Teams privacy policies, visit: https://learn.microsoft.com/en-us/microsoftteams/teams-privacy.

How will my anonymity be protected?
Anonymity refers to protecting participants' identifying characteristics, such as name or description of physical appearance. Given that the simulation and group debrief occur in small groups, anonymity from other participants cannot be guaranteed. The information that you choose to share in your reflective journal entries and one-on-one semi-structured interviews will be anonymized using a pseudonym. However, demographics, experiences, and specific characteristics that you choose to share in the reflective journal entries or semi-structured interview may make you identifiable to some.

Every reasonable effort will be made to ensure your anonymity; you will not be identified in publications without your explicit permission.

How will the data collected be stored?

This study will use Microsoft Teams to collect data, which is an externally hosted cloud-based service. As previously mentioned, when information is transmitted over the internet privacy cannot be guaranteed. There is always a risk your responses may be intercepted by a third party (e.g., government agencies, hackers). Further, while the researcher(s) will not collect or use IP address or other information which could link your participation to your computer or electronic devices without informing you, there is a small risk with any platform such as this of data that is collected on external servers falling outside the control of the research team. If you are concerned about this, we would be happy to make alternative arrangements (where possible) for you to participate, perhaps via telephone.

Video (and audio) of your simulation which is available for you to view after the simulation are stored on the cloud-based server and deleted by the simulation operations technician at the end of each institutional semester. This video is not considered data however you may choose to describe what you notice in the video in your journal entries.

Journal entries will be stored in a password-protected cloud-based Microsoft application until data is anonymized. At that time, the journal entries will be saved to a cloud-based, password-protected file for 5 years after the research study concludes.

Interview recordings (audio/video) will be saved in a password protected cloud-based storage to allow you and the researcher to confirm and/or clarify the transcript (one week). After one week, the video will be deleted, and the transcript will be anonymized. The transcript will be anonymized and saved to a cloud-based, password-protected file for 5 years after the research study concludes.

A document with participant pseudonyms will be maintained in a password-protected file on the aforementioned cloud-based service.

Please note that it is the expectation that participants agree not to make any unauthorized recordings of the content of a meeting / data collection session.

Who will receive the results of the research project?

The existence of the research will be listed in an abstract posted online at the Athabasca University Library's Digital Thesis and Project Room and the final research paper will be publicly available. Furthermore, the results of this research project will strive for publication in an academic journal. Results of the research may also be presented at conferences, group forums, or within special-interest groups.

Participants will be provided with an executive summary of the findings once available.

What will be published?
The results of this research will include data from participants' journals and one-on-one interviews. Given that the aim is to include multiple representations of knowledge, this may include direct quotations, images, doodles, memes, poetry, gifs, photos, etc.

Who can you contact for more information or to indicate your interest in participating in the research project?
Thank you for considering this invitation. If you have any questions or would like more information, please contact me, (the principal investigator) by e-mail at msherrer1@learn.athabascau.ca or melissa.sherrer@flemingcollege.ca. Alternatively, you may contact my supervisor(s) by email at barbara.wilson-keates@rdpolytech.ca or vbryan@athabascau.ca.

If you are ready to participate in this project, please complete and sign the attached Consent Form and return it by [date] to Melissa Sherrer, via email at melissa.sherrer@flemingcollege.ca.

Thank you.

Melissa Sherrer

This project has been reviewed by the Athabasca University Research Ethics Board. Should you have any comments or concerns about your treatment as a participant, the research, or ethical review processes, please contact the Research Ethics Officer by e-mail at rebsec@athabascau.ca or by telephone at 780.213.2033.

Informed Consent:

Your signature on this form means that:

- You have read the information about the research project.
- You have been able to ask questions about this project.
- You are satisfied with the answers to any questions you may have had.
- You understand what the research project is about and what you will be asked to do.
- You understand that you are free to withdraw your participation in the research project without having to give a reason, and that doing so will not affect you now, or in the future
- You understand that if you choose to end your participation **during** data collection, any data collected from you up to that point will be destroyed
- You understand that if you choose to withdraw **after** data collection has ended, your data can be removed from the project at your request, up to the point of anonymization
- You understand that your data is being collected anonymously, and therefore cannot be removed once the data collection has ended.

	YES	**NO**
I agree to be audio-recorded	☐	☐
I agree to be video-recorded	☐	☐
I agree to the use of direct quotations dissemination	☐	☐
I agree to the use of journal entries (such as poetry, images, doodles, gifs, memes, etc) in dissemination	☐	☐
I am willing to be contacted following the interview to verify that my comments are accurately reflected in the transcript.	☐	☐

Your signature confirms:

- You have read what this research project is about and understood the risks and benefits. You have had time to think about participating in the project and had the opportunity to ask questions and have those questions answered to your satisfaction.

- You understand that participating in the project is entirely voluntary and that you may end your participation at any time without any penalty or negative consequences.

- You have been given a copy of this Informed Consent form for your records; and

- You agree to participate in this research project.

_____ _____

Signature of Participant Date

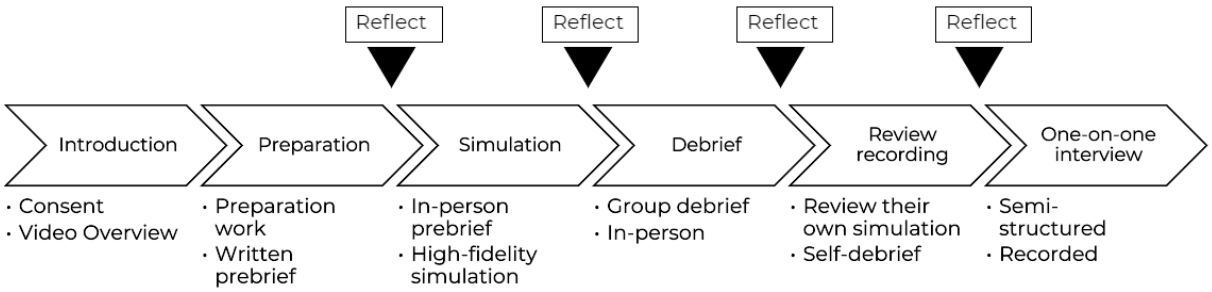
Principal Investigator's Signature:

I have explained this project to the best of my ability. I invited questions and responded to any that were asked. I believe that the participant fully understands what is involved in participating in the research project, any potential risks and that he or she has freely chosen to participate.

_____ _____

Signature of Principal Investigator Date

Appendix G: Simulation Design



Appendix H: Prebrief

Prebrief Document

Semester 3/4 Clinical Simulation Day

Faculty: Melissa Sherrer
Facilitator: Stephanie Devitt
Course: N/A
Course Code: N/A
Simulation Activity: High-fidelity simulation with an SP
Location: Simulation Lab (A1126)

Welcome

Purpose: Welcome all learners when they arrive. Introduce yourself and other facilitators.
Include: Faculty, Simulation Operations, etc.

Basic Assumption

"It is our belief that you are intelligent, capable, care about doing your best and want to improve."

We include this basic assumption to remind learners that simulation is a safe space to learn from and with your peers. It is okay to make mistakes. These mistakes become an opportunity for learning.

Psychological Safety

The following simulation will immerse you in a situation where you are responsible for recognizing and responding to clinical signs and symptoms. While the simulation may cause mild and temporary feelings of discomfort or stress, these symptoms should resolve quickly. At any time during the simulation, you may choose to step out of the simulation to prioritize your own health. Should these symptoms persist, please access the Fleming College Wellness resources available through the Student Portal.

This session will be recorded however it is not graded or reviewed by the researcher. The recording will be sent to you within 7 days of the simulation for you to review and reflect on your performance independently. Upon completion of the simulation, you will be provided with the opportunity to debrief as a group. This is an opportunity to reflect on your thoughts, feelings, and emotions that arose during the simulation, and consider how the simulation

Prebrief Document

applies to the clinical setting. The group debrief will not be recorded or reviewed by the primary researcher.

Overview of the Simulation

The purpose of this simulation is to provide you with an opportunity to respond to a clinical scenario. It is intended to challenge your critical thinking, teamwork and problem solving skills. By participating in this simulation, you will have the opportunity to:

- Assess a patient, identifying and mitigating issues which compromise safety
- Recognize and respond to critical findings within your individual scope of practice as a semester three or four nursing student
- Apply critical thinking skills to better understand the patient and the clinical situation
- Demonstrate group leadership by contributing to a community of learning

Confidentiality

During this simulation, we ask you to be non-judgmental and open to learning from both the simulation, your facilitator(s), and fellow learners who are debriefing the simulation. It is however important to remember that "what happens in the simulation stays in the simulation". By maintaining confidentiality related to the virtual simulation experience and others' choices or comments, you help to create psychologically safe learning environment and effective experience for all learners.

Any breach in confidentiality regarding the simulation environment is considered a violation of academic integrity equivalent to plagiarism, under the Academic Integrity Policy and Procedure (2-201A). It could also be considered a breach as this translates to professional practice.

Fiction Contract

In this simulation, you will be asked to play the role of a nurse, practicing within your individual scope of practice as a semester three or four nursing student. We ask you to do your best to stay in character to support the learning from and with your peers.

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Simulation Logistics

Timeline
The simulation will begin when you enter the room, and you will have 15 minutes to complete the assigned tasks. You will know that your time is up, as you will hear "Time" over the intercom. You will be asked to complete your scenario at that time.

Recording
This simulation will be recorded. The recording will begin when you enter the space. Within seven days of completing the simulation, the simulation operations technician will provide you with a password-protected link to review and reflect on the simulation.

Roles
You will be assigned to play the role of a nurse, entering the clinical environment with a peer. as the participant or observer. We encourage you to work as a team and discuss your thinking out loud with your simulation partner to determine next steps.

Debrief
A group debrief will take place after the simulation in room [enter room] at [enter time]. The debrief will last approximately 60-90 minutes. You are expected to attend and participate in the group debrief discussion.

Room Details
When you enter the simulation, you will see a hospital bed with a patient in the bed. The patient in the bed is a simulated participant – an individual who has been coached to play the role of the patient. At the head of the wall, you will see a simulated head wall with oxygen. A supply room will be stocked in one corner of the room. In another corner of the room, you will find the patient's medication administration record and medications which may be needed. In the medication area, you will also find a phone which will call in to the physician if you need to report an abnormal finding or ask for an order.

Equipment

[Simulation Operations Technician to provide details about the equipment required for this simulation and instructions on its use].

Equipment #1
Description

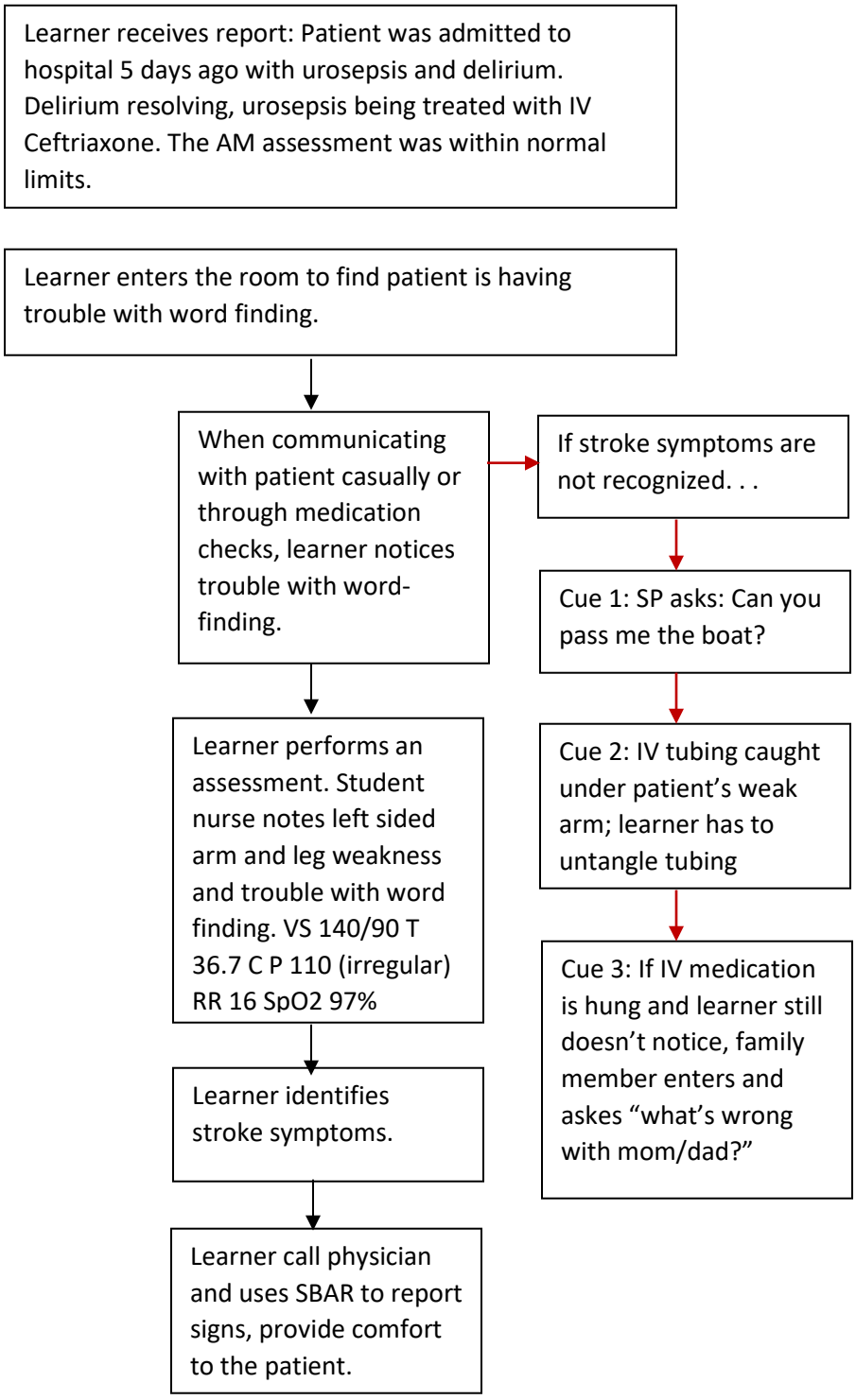
Prebrief Document

Equipment #1
Description

Review Case Description

Jo da Silva is an 84-year-old patient admitted to the hospital 5 days ago with urosepsis and delirium. The delirium is resolving and the urosepsis is being treated with IV Ceftriaxone. You receive report that assessment findings and vital signs were within normal limits this morning. You are heading in the room to perform a morning assessment and hang their final dose of IV Ceftriaxone. If abnormal assessment findings are noted, you are expected to call the physician and report the abnormal findings using SBAR format.

Appendix I: Simulation Overview



Appendix J: PEARLS Debriefing Tool

Debrief Document

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PEARLS Debriefing

Faculty: Melissa Sherrer
Facilitator: Stephanie Devitt
Course: N/A
Course Code: N/A
Simulation Activity: High fidelity simulation with a simulated participant
Location: Simulation Lab (1126)

Introduction

The "Promoting Excellence and Reflective Learning in Simulation (PEARLS)" allows the learners to debrief their reactions to the experience, describe the event, analyze their behaviours or performance during the simulation, and apply new knowledge to professional practice.

Prebrief the Debrief

Let's spend 60 to 90 minutes debriefing. Our goal is to improve how we work together and care for our patients. Everyone here is intelligent and wants to improve.

To encourage fulsome discussion, it's important that all information shared in the debrief remains confidential.

Reactions

Purpose: Explore feelings before, during and after the simulation.

Prompt questions:

1. How are you feeling?
2. Any initial reactions?

Description

Purpose: Clarify facts.

Prompt questions:

1. Can you please share a short summary of the case?
2. Does everyone agree?

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Analysis

Purpose: Explore a variety of performance domains. You may choose to approach this using 1 or all 3 of the following approaches depending on time and what is most beneficial to the learners.

Learner Self-Assessment

1. What aspects of the simulation do you think you managed well?
2. What aspects of the simulation would you want to change?

Directive Feedback and Teaching

1. I noticed you *insert performance gap here.* Next time you may want to *close gap* because *provide rationale.*

Facilitation (e.g. Advocacy-Inquiry)

1. What specifically would you [the learners] like to talk about?

Application/Summary

Purpose: Identify takeaways.

Learner-Centred

1. What are the key takeaways from this discussion for our professional practice?

Instructor-Centred

1. The key learning points for the case were [insert learning points here].

Resources

For a thorough overview of the PEARLS Debriefing Tool or suggestions for additional prompt questions, access the full complement or resources below:

Bajaj, K., Meguerdichian, M., Thoma, B., Huang, S., Eppich, W., & Cheng, A. (2017). The PEARLS healthcare debriefing tool. *Academic Medicine*. https://debrief2learn.org/pearls-debriefing-tool/

Appendix K: Interview Guide

Identity

1. How would you describe yourself as a person?
2. How would you describe yourself as a learner?

Simulation

1. Describe this learning experience to me.
    a. Prompt: Imagine you are describing the experience to a friend who knows nothing about simulation. What would you tell them?
2. What do you believe you learned by participating in this simulation experience?
3. In your opinion, when/where/how did this learning occur?
4. Describe your experience preparing for the simulation. What thoughts, feelings, and emotions did you experience while preparing for the simulation?
5. What thoughts, feelings, and emotions did you experience during the actual simulation? How did they evolve over the course of the simulation?
6. How did you make decisions during the simulation?
7. Describe a moment in which you felt successful during the simulation. What contributed to this success?
8. Describe a moment in which you felt unsure of yourself during the simulation? What led you to feel unsure of yourself?
9. What activities did you complete after the simulation? How did these activities impact your learning?

Clinical Outcomes

1. Does simulation support your clinical practice? Why or why not?

2. Can you describe an experience you have had in clinical placement which is similar to the situation you experienced in the simulation?
3. If you were to encounter a patient in clinical practice next week who was deteriorating, do you feel this simulation would impact your response? Why or why not?

Appendix L: PETs and GETs