4-12-2017

A Comparison of Two Debriefing Methods on Clinical Reasoning Outcomes, Learner Satisfaction with Debriefing and Reflection, Clinical Learning and Clinical Reasoning, and Psychological Safety of Nurse Orientees in Simulation-Based Education

Lori Persico

This research was completed as part of the degree requirements for the Nursing Department at Molloy College.

A COMPARISON OF TWO DEBRIEFING METHODS ON CLINICAL REASONING OUTCOMES, LEARNER SATISFACTION WITH DEBRIEFING AND REFLECTION, CLINICAL LEARNING AND CLINICAL REASONING, AND PSYCHOLOGICAL SAFETY OF NURSE ORIENTEES IN SIMULATION-BASED EDUCATION

MOLLOY COLLEGE

BARBARA H. HAGAN SCHOOL OF NURSING

PH.D. NURSING PROGRAM

A Dissertation

by

LORI PERSICO

MOLLOY COLLEGE

BARBARA H. HAGAN SCHOOL OF NURSING

The dissertation of Lori Persico entitled A COMPARISON OF TWO DEBRIEFING METHODS ON CLINICAL REASONING OUTCOMES, LEARNER SATISFACTION WITH DEBRIEFING AND REFLECTION, CLINICAL LEARNING AND CLINICAL REASONING, AND PSYCHOLOGICAL SAFETY OF NURSE ORIENTEES IN SIMULATION-BASED EDUCATION in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the Division of Nursing has been read and approved by the committee:

Ann Marie Paraszczuk, Ed.D, RNC-NIC, IBCLC Chairperson
Molloy College

Victoria Siegel RN, CNS, Ed.D (Member)
Molloy College

Michael Cassara D.O., CHSE, MSEd (Member)

Associate Professor of EM
Hofstra Northwell School of Medicine
North Shore University Hospital

Veronica D. Feeg, PhD, RN, FAAN
Associate Dean, Director of the PhD Program
Molloy College, Barbara H. Hagan School of Nursing

Date 4-12-17

ABSTRACT

Simulation-based education is a teaching method used successfully in military, aviation, and medical education; however, the evidence rarely indicates how debriefing affects the learners' experiences. Debriefing is an essential component of simulation-based education that fosters conceptual learning, critical thinking, and clinical reasoning. The purpose of this study was to compare the effects of two different debriefing methods on nurses' perceptions of psychological safety, satisfaction with development of clinical reasoning skills, and satisfaction with learning. In this quasi-experimental, posttest study the researcher explored the effect of each debriefing method. Using the 18-item Satisfaction with Simulation Experience Scale developed by Levett-Jones et al. (2011), the researcher measured learners' satisfaction with the simulation learning experience. The researcher developed a visual analog scale to measure the learner's perceived psychological safety. During the simulation learning experience part of an orientation, the researcher used two debriefing methods using the 3D Model of Debriefing: (1) Defusing, Discovering and Deepening (3D-DDD) and (2) the DEBRIEF method. The literature clearly articulates how these models are distinct in how debriefing is executed in the simulation experience. The "debriefers" received appropriate training on the models and were then verified by the investigator for treatment fidelity. After each debrief method, the researcher measured the participants' experiences including psychological safety and satisfaction, as well as clinical reasoning skills. The researcher divided study participants into two groups and administered one of the two debriefing models. By alternating debrief methods, the researcher ensured that all groups in each month were debriefed using the same method. Both methods resulted in psychological safety and satisfaction. There were no statistically significant differences in either debrief method for the SSES, VAS, and case study scores. The analysis did not identify any

meaningful relationships between a learner's characteristics and satisfaction in debriefing and reflection, self-reported clinical reasoning, and clinical learning. The literature recognizes debriefing as a vital teaching strategy, but there remains minimal research on how to debrief, which methods are effective at achieving learning outcomes, and which are best at fulfilling an individual's psychological safety.

DEDICATION

"Be strong and courageous; do not be terrified or afraid of them. For the LORD your God is the one who will go with you; he will not leave you or abandon you". Deuteronomy 31:6

This study is lovingly dedicated to my faith and family, both of these forces held me up and carried my thorough the journey. Your love and support is what carried me through.

ACKNOWLEDGEMENTS

This dissertation had the hands of many lay upon it. A community built this research.

My husband and children, I have nothing but love and gratitude for all your unending support. I will love you to infinity and beyond.

I wish to thank my committee members for the guidance throughout the process. The mentorship provided the foundation for this nurse scholar.

To the participants of the study, I am truly grateful for your volunteerism and support of nursing research. I am very thankful to my colleagues.

The team at the Patient Safety Institute, you were with me every step of the way. There are some special individuals. Bob Kerner, thank you for your belief in me. I am forever grateful for your mentorship and expertise in simulation–based education and photography skills. Joe Lalor, you inspire me every day. The research could not have been completed without your mastery of mentorship and debriefing. Anthony Amorese, you are my biggest supporter. You are an inspiration to me each day as an educator and surprise me every day with your knowledge. John Perrone, you are an excellent role model and thank you for your excellence in technology. James Anglim, your editorial skills and unending support are so greatly appreciated.

I wish to acknowledge nursing education team and its dedication to the research and its process. Thank you for all your time and effort.

Toby and Laura, there are no words to describe the love I have for you and your friendship. I am truly blessed to have you in my life. You were my partners in this journey.

To my parents, you provided me with the foundation of faith, courage and determination. I have infinite love for you both.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

APPENDICES

CHAPTER 1

Statement of the Problem

Introduction

The multifaceted medical regimens and increased patient acuity levels present in health care today require that nurses have a firm knowledge base. With this increase in acuity, complexity, and focus on safety, healthcare systems must have highly skilled, clinically competent nurses to provide quality care. While nursing programs have the responsibility to prepare nursing students for entry into practice, nurse educators within healthcare systems must evaluate and further develop the decision–making ability of newly employed nurses to ensure the provision of safe and high quality patient care. This goal can be achieved with teaching methods, such as simulation-based education, that foster conceptual learning, critical thinking, and clinical reasoning.

Background

Simulation-based education (SBE) is an emerging teaching method used successfully in military, aviation, and medical education. In medical education, it has demonstrated effectiveness in enhancing learning of procedural skills, evidence-based clinical guidelines, teamwork, and communication in a controlled environment. Using technology, learners interact in authentic, replicated clinical situations, engage in independent decision-making, and see the results of their actions without causing harm to real patients (Gaba, 2004; Kaddoura, 2010). Experiential learning enables learners to shift from performing isolated tasks to developing clinical reasoning in complex clinical situations, and provides a safe environment for learners to make mistakes, reflect on clinical performance, and construct the thorough knowledge base needed for nursing practice (Kneebone, Scott, Darzi, & Horrocks, 2004). By contextualizing

coursework to actual nursing practice rather than viewing it abstractly, learners can make connections between acquired and applied knowledge; this enables educators to integrate classroom learning with clinical practice (Benner, Sutphen, Leonard, & Day, 2010).

Post-simulation debriefing, the non-critical, non-threatening, reflective inquiry facilitated by the educator, exposes the thinking that directed actions in simulation and is considered vital to knowledge development (Billings & Halstead, 2009). Debriefing is an essential component of simulation-based education because learning happens during this process (Fanning & Gaba, 2007; Gaba, 2004; Van Heukelom, Begaz, & Treat, 2010). Educators use open-ended questions to guide the discussion and to promote students' reflection on the cognitive and behavioral processes that occurred during simulation. This reflective process is a core element for experiential learning; it is through self-reflection and subsequent analysis that learners build knowledge and improve their practice (Fanning & Gaba, 2007). Through reflection, students move beyond critical thinking toward higher clinical reasoning skills and an understanding of how experience influences subsequent clinical situations (Jasper, 2003; Lasater, 2007b). Debriefing allows students to verbalize what they have learned and which measures can improve patient outcomes.

Statement of the Problem

Nurse educators have an important role in establishing safe and effective nursing practice by fostering critical thinking and the development of clinical judgment in learners. For educators working in healthcare systems, the process, assessment, and development of clinical judgment in newly hired nurses begins during the orientation program. The orientation process presents many challenges. First, it is a process that needs to be accomplished expeditiously; these nurses are usually hired to fill vacant positions and thus need to begin their new roles as soon as

possible once they begin their employment. Second, the nurses within each orientation group can vary widely in experience, from newly graduated and licensed nurses to nurses who have a broad range of work experience. There may also be nurses in orientation who need additional knowledge or a certain skill set beyond that included in generic nursing education programs because they are hired to work with specific populations of patients or in particular roles. Research has identified that nurses with inadequate clinical reasoning skills often fail to detect impending patient deterioration resulting in a failure-to-rescue (Aiken, Clarke, Cheung, Sloane, & Silber, 2003). Clinical judgment is reliant on sound reasoning because it is the conclusion of the cognitive process. The wrong conclusion can lead to adverse patient events. It is imperative for nurse educators to identify orientees' abilities and learning needs in order to help them develop the clinical reasoning and judgment necessary to provide safe and effective patient care.

These issues, in combination with the increasing complexity of healthcare today, require that nurse educators in service areas use effective methods to orient newly hired nurses.

In traditional orientation programs, educators use both classroom with text-based methods and clinical experience to enable learners to acquire the knowledge and skills needed in their new positions. Although these experiences are beneficial, there are still shortcomings. It is often not possible for orientation programs to expose nurses to the different health problems their future patients may have. In addition, orientees' may lack the ability to recognize and manage patient complications that occur infrequently. To address these issues, healthcare institutions incorporate simulation-based education (SBE) into the orientation process. Research has indicated SBE is as a successful teaching strategy with applications along the continuum of learner experience and level of education. The Institute of Medicine's report "Keeping Patients Safe: Transforming the

Work Environment of Nurses" (2004) recommends simulation as a method to support nurses in the ongoing acquisition of knowledge and skills.

A critical component of simulation-based education is debriefing; however, the research in this area is limited. Various debriefing models and methods exist, resulting in differences in the application of this teaching strategy. There is concern among educators that these differences in debriefing methods can directly affect a learner's psychological safety, the attainment of learning outcomes through the development of sound clinical reasoning, and satisfaction with learning. Without sufficient research in debriefing, there is little evidence to direct the development of best practices for debriefing (Dreifuerst, 2009; Fanning & Gaba, 2007; Raemer et al., 2011; Rudolph, Simon, Dufresne, & Raemer, 2006). According to Neill and Wotton (2011), there is a need for nurse educators to better comprehend debriefing in order to establish evidence-based practices.

Purpose of the Study

The purpose of the study is to compare how two different debriefing methods affect nurse orientees' perception of psychological safety, satisfaction with development of clinical reasoning skills, and satisfaction with learning**.** During orientation programs using a simulation learning experience, the researcher measured clinical reasoning skills after each debriefing method by using a case study followed by an examination. The two compared debriefing methods are the 3D Model of Debriefing: Defusing, Discovering and Deepening (3D-DDD) and DEBRIEF method.

Research Questions

This quasi-experimental, posttest study shows the effect of the type of debriefing method on both participants' examination performance and their perceptions after the simulation

experience. The two debriefing methods are the 3D Model of Debriefing: Defusing, Discovering and Deepening (3D-DDD) and the DEBRIEF methods. The researcher investigated these methods during an interprofessional orientation program. Both debriefing models contain the advocacy and inquiry framework. The research questions that guided the study are:

- Is there a difference in posttest score between participants who experienced different debriefing methods following a simulation experience?
- Are there differences in the nurse orientees' satisfaction in debriefing and reflection, self-reported clinical reasoning, and clinical learning for nurse orientees who experience different debrief methods?
- Is there a difference in the perception of psychological safety for nurse orientees who experience different debrief methods?
- What differences do faculty members describe between the two different debriefing methods?
- What is the influence of certain learner characteristics (i.e. culture, gender, age) on satisfaction in debriefing and reflection, self-reported clinical reasoning, and clinical learning for nurse orientees who experience different debrief methods?

Significance of the Study

Benner (1982) identified that advancements in technology, decreased length of hospital stays, and high acuity levels have led to the need for highly experienced nurses who require ongoing career development. Today, nurses are preparing to function in a complex healthcare environment where high-level thinking is necessary to provide safe, quality care (Ironside, 2003). Multiple ways of thinking are necessary; the educational approach should not focus exclusively on critical thinking but also encompass clinical reasoning and clinical judgment.

The overuse of critical thinking leads to excessive doubt; therefore, nurses need to have clinical imagination, scientific theory, and clinical reasoning in order to meet the changing clinical demands of the patient (Benner et al., 2010). Clinical reasoning includes collecting cues and processing information in order to examine and understand an individual patient's specific problem; this in turn promotes the implementation of best practices and best patient outcomes.

Clinical simulations can bridge the gap between knowledge gained in the classroom and clinical practice with patients. A simulation learning experience permits the orientee to apply nursing process, knowledge, and skill in a controlled environment. The nurse demonstrates the capacity to clinically reason by assessing the patient's problems/needs, and analyzing data to accurately identify and frame problems within the context of the individual patient's environment (Murphy, 2004). A guided discussion, or debrief, helps to understand the nursing actions or inactions. This debriefing process is an integral teaching strategy, engaging the learner in an interactive process of guided reflection that reveals students' thought processes (Cantrell, 2008).

Debriefing that follows simulation facilitates the learner's ability to verbalize actions, articulate rationales, identify errors, and correct knowledge and skills (Lasater, 2007a, 2007b)**.** While directly chastising learners may sometimes be efficient, in that it quickly and directly shows learners their errors during simulation, it can degrade students' self-confidence and hinder performance (Rudolph, Foldy, Robinson, Kendall, Taylor, & Simon, 2013). The debriefing facilitator has an influence on the learner's behavior during the debriefing session (Dieckmann, Friis, Lippert, & Ostergaard, 2009). Hence, educators lacking evidence on best practices for debriefing may use methods that can provoke anxiety, consequently affecting psychological safety and learning outcomes**.**

A primary objective during the debriefing discussion is to maintain the psychological safety of the participants by using good judgment and non-threatening open-ended questions. The inquiry is a formative assessment; reflection exposes the challenges of simulation and traces the mental frames that guided the cognitive processes that lead to effective or ineffective /harmful actions, while constructive feedback provides for improvement (Dismukes, Gaba, & Howard, 2006; Meakim, Boese, Decker, Franklin, Lioce, Borum, 2013; Waxman, 2010). Critical thinking is a highly active and specifically directed cognitive process that involves perceiving information, interpreting it based on what is already known, and then reorganizing the information into new insight or understanding (Bastable, 2008). Clinical reasoning depends on recognizing the cognitive processes that occurred during simulation to enhance learning and promote accuracy in decision-making. Clinical reasoning, which is the capacity to identify commonalties in clinical situations and prudently apply learned theories, sustains sound clinical judgment. Debriefing allows for reflection and allows the learner to examine the elements that directed or influenced their clinical judgment. The goal of debriefing is to analyze an event to enhance understanding with the intent of applying the new knowledge to future practice (Jefferies, 2007).

Debriefing brings awareness to the learner's decision-making process. Educators play a pivotal role by asking open-ended questions to guide the student through self-reflection in a safe environment. Although SBE is a valuable instrument in teaching clinical modalities, there are still gaps in the standardization of debriefing methods and the knowledge of the effectiveness of debriefing on the development of clinical reasoning. Educators are cognizant of the benefits of simulation-based education but often report a lack of preparation and consistency in this teaching modality (Dreifuerst, 2009, 2010; Jefferies, 2005).

Knowledge and skills of effective debriefing are as important as knowing how to create and implement simulation scenarios (Dreifuerst, 2009, Dreifuerst 2010; Jefferies, 2005). Currently, there are limited publications in the peer-reviewed literature about important aspects of debriefing such as: length of time to debrief, techniques of how to teach or learn debriefing, which methods of debriefing are most effective in achieving learning, and how to best measure learning (Fanning & Gaba, 2007; Levett-Jones & Lampkin, 2013; Neill & Wotton, 2011). "The paucity of nursing research on evidence-based strategies for efficacious debriefing is a cause of concern considering its importance of simulation debriefing" (Neill & Wotton, 2011, p. e161).

Definitions of terms

- *Advocacy and Inquiry (AI)* – a debriefing framework in which debriefing discussions are delivered from a stance of authentic inquiry accompanied with a supportive environment and dialogue. This is known as debriefing with good judgment.
- *Critical thinking* – a cognitive process needed to review collected clinical data, scientific theory, and nursing knowledge, and their relevance in the clinical presentation prior to nursing action.
- *Clinical reasoning* – a component of the critical thinking, clinical reasoning and clinical judgment continuum in which information is processed in context and a plan is formulated to address the patients' problems.
- *Clinical judgment* – the nursing action after salient interpretation of patient data. Clinical judgment is contingent on familiarity with nursing process and scientific reasoning.

- *3D Model of Debriefing (3D-DDD)* – a debriefing method that utilizes the AI framework and identifies the phases of debriefing discussions as defusing, discovering and deepening.
- *DEBRIEF* – a debriefing methodology that incorporates the following actions: Define rules, Explain learning objectives, Benchmarks for performance, Review what was supposed to happen, Identify what happened, Examine why, Formalize learning.
- *Mental model* – a cognitive process where conscious or unconscious beliefs, ideas, images, and verbal descriptions are used to form a basic assumption. This is a bias that guides behavior and actions or inactions.
- *Orientee* – the learner in the study: a registered nurse employed in the healthcare system who has less than one year of experience or has transferred within the system and has not attended the interprofessional orientation program within the past two years.
- *Psychological safety* – the established environment that provides boundaries and trust allowing the individual to feel accepted and respected.
- *Simulation-based education (SBE)* – an interactive and guided educational process which immerses the learner into a replicated clinical scenario in a controlled and safe environment.
- *Debriefing stance* – a basic assumption or mental frame about the learners; the understanding that participants are intelligent individuals doing their best and want to improve.
- *Circular questions* – questions asked to a third person to explore and describe the relationship between other individuals that participated in a simulated event.

- *IPASS the Baton* – a method of communicating a patient's clinical condition and/or needs from one clinician to another when a transition in care occurs. The acronym stands for: Introduction, Patient, Assessment, Situation, Safety, Background, Actions, Timing, Ownership, and Next.

Conclusion

Nurse educators strive to develop a nurse's clinical reasoning skills and promote transfer of knowledge to the clinical setting. The objective of debriefing is to increase the participants' awareness of their actions and behaviors and the clinical judgments/decisions that motivated them. Instructors play a pivotal role in this process by asking open-ended questions to guide the student through self-reflection in a safe environment. The learner's ability to reflect is contingent on the educator's ability to provide appropriate feedback. Although simulation is a valuable teaching strategy, there are still gaps in the knowledge of the effectiveness of various debriefing methods used in the simulation community. Research is necessary to identify the best debriefing practices to accomplish the goal of developing learners' knowledge through simulation-based education.

CHAPTER 2

Review of the Literature

Introduction

Simulation-based education (SBE) has been widely adopted as an instructional methodology for healthcare professionals and, as a result, numerous published articles describe the various uses of debriefing within the literature. This chapter includes a review of the literature addressing aspects related to this study and is divided into four sections. The first section describes the theory that serves as a framework for the research questions specific to debriefing methods. The second section addresses three concepts that are important to learning in simulation-based education: critical thinking, clinical reasoning, and clinical judgment. The third section describes simulation and debriefing and the learning process as related to clinical reasoning, psychological safety, and learner satisfaction. The chapter concludes with a review of studies of techniques used in debriefing that are known to enhance learning.

Theoretical Framework

The development of simulation as an education strategy is supported by several learning theories. The theory that guided this research was Kolb's Experiential Learning Model. This theory explains how knowledge development occurs through experience and how new knowledge is related to what is known and retained and provides a foundation to learning through simulation and debriefing.

Kolb's Experiential Learning Model

According to experiential learning theory (ELT), knowledge is obtained through a transformation experience. "Knowledge results from the combination of grasping and transforming experience" (Kolb, 1984, p. 41). Kolb describes experiential learning as a process

that involves more than learning a set of facts, etiquette, or ideas. Learning is a continuous process, and knowledge is created by transforming experiences into cognitive frames, thereby altering an individual's thinking and actions (Kolb, 1984). Transformation arises through extension or intention. Extension is a process achieved by active external experimentation, while intention is achieved by internal reflection on the experience (Kolb, 1984; Lisko & O'Dell, 2010). "Learning is a continuous adaptation and resolution of the way a person conceptualizes the world and what a person actually experiences" (Wang, 2011, p. 672). Replicated clinical events offer concrete experiences to learn from, where the participants bring prior knowledge and adapt to the needs of the patient situation. Debriefing explores the mental models that guided behavior and actions.

Experiential learning presents learners with a method for developing and adapting their knowledge, skills, and attitudes. The tenets of Experiential Learning Theory (ELT) are:

1) Learning is a process where the learner is engaged in an active experience.
2) All learning is relearning; it is a method that offers the learner the opportunity to examine their beliefs and ideas and integrate them with new ideas.
3) Learning is a dialectic process promoting reflection, action, feeling, and thinking.
4) Learning is holistic and integrative; it takes into account how the whole person thinks, feels, perceives, and behaves when solving problems and making decisions.
5) Learning is based on lived experience and involves the interaction between person and environment.
6) Knowledge is created by the learning process; social knowledge is generated through personal knowledge.

(Kolb, 1976; Kolb, 1984; Magnolis, Burns, Assudani, & Chinta, 2013; Poore, Cullen, & Schaar, 2014; Wang, 2011). Simulation-based education enables a tangible experience where participants can be fully involved, and that also serves as a medium for theory connection.

Kolb asserts that learning is a continually recurring cycle; each time a learner completes the learning cycle, learning can then occur at a higher more complex level (Davies & Gidman, 2011; Kolb & Kolb, 2009). ELT recognizes the importance of individual learning styles and provides opportunity for each learner to acquire knowledge based on his or her individual preferences (Kolb & Kolb, 2009). In Kolb's model, two pairs of polar opposites comprise four stages. The learning cycle contains four modes (Figure1): concrete experience (CE), reflective observation (RO), abstract conceptualization (AC), and active experimentation (AE) (Kolb, 1976, 2009; Kolb & Kolb 2010). The individual learning style is determined by which two of the four stages a person emphasizes (Billings & Halstead, 2009). Table 1 outlines the four learning styles and preferences.

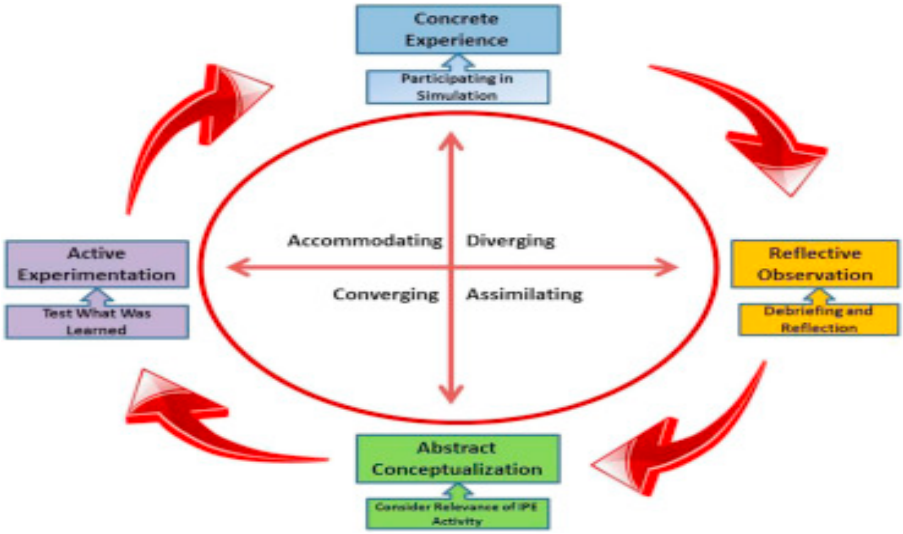
Simulation-based education (SBE) is a teaching strategy that stimulates the learner through Kolb's learning cycle and meets individual learning styles. The simulated scenario provides the concrete experience (CE). Reflective observation (RO) occurs during simulation when the participant actively reflects on clinical actions and the influence that those actions can have on patient responses. In addition, reflective observation (RO) also occurs during debriefing, as the educator explores the clinical decisions the participant has made. Debriefing discussion exposes alternatives, where the learner considers how different actions could enhance clinical outcomes.

Table 1

Kolb's Learning Styles Inventory-(1976)		
Learning Style	Learning Preferences	Learns best through
Divergent	Concrete experience and reflective observation	Reflection, look at the situation through many perspectives, generate ideas, inclined to work in groups, communicative, creative, imaginative
Assimilative	Reflective observation and abstract conceptualization	Organizing the abstract into logic form, analyzes, systematically plans
Convergent	Abstract conceptualization and active experimentation	Problem solving, finding practical use for learned theory or concepts
Accommodative	Concrete experience and active experimentation	Active involvement, prefer hands-on learning to manage a new challenge

According to the theory, learning can be more effective when participants move through each of these four components. As a cycle of learning is completed it leads to another set of experiences, and thus another cycle of learning, ultimately transforming the learner.

Figure 1



(Poore, Cullen, & Schaar, 2014)

Immersive simulation is a planned educational activity in which learners take part in the care of a simulated patient in an environment realistic enough for the participants to feel immersed in the surroundings, suspend disbelief, and manage the scenario as if the patient were

real (Wang, 2011). Simulation events, followed by debrief, moves the learner through the four components of Kolb's learning cycle while meeting the learning style of the participant. Zigmont, Kappus, and Sudikoff (2011a) identified the elements of experiential learning, including: 1) replication of clinical scenarios that provides the concrete experiences whereby the learners identify knowledge gap; 2) debriefing that allows reflective observation, where the learner has an opportunity to reflect on the simulated event and their performance; 3) the educator's guided questioning by which abstract conceptualization is achieved; this process reveals the mental models that lead to behaviors and helps to influence future actions; 4) the active experimentation on the part of the learner that occurs when the mental models are understood and the new learning is connected to future clinical practice.

In this study, participants moved thorough Kolb's four stages of learning while meeting learning preferences. First, the participants participated in a replicated clinical event to experience sepsis, followed by a specific debriefing method. The reflective and supportive dialogue during debriefing help to expose the learner's mental frames that are not observable or identifiable during a simulated scenario. Debrief discussions facilitate reflection on action or lack of action. Post-simulation dialogue compares actual performed nursing actions to established evidence-based practices to uncover cognitive frames and to close the gap between performance and established theory and practice. An individual may not be consciously aware of their internal cognitive processes that led to the action; therefore, the educator must maintain a stance of authentic curiosity throughout the debriefing process to avoid making assumptions about the learner's mental models (Zigmont et al., 2011b). Guided questioning promotes engagement and active retrospection. Debriefing conversations support experiential learning theory because the learner reflects, reviews, evaluates, and tests new knowledge. The learner explores mental

models, and identifies knowledge gaps; this facilitation progresses the learner through concrete observation, reflective observation, abstract conceptualization, and active experimentation. According to Kolb, optimal and meaningful learning occurs once a learner cycles through these four stages. Meaningful learning occurs when the individual extends beyond rote memorization and recognizes links between concepts (Ausubel, 1962, Ausubel, 1968).

Critical Thinking, Clinical Reasoning and Clinical Judgment

Safe nursing practice is dependent on the continuum of critical thinking, clinical reasoning, and clinical judgment. Critical thinking is a broad term encompassing many forms of thinking that nurses employ in clinical practice. Nursing literature synonymously uses the terms clinical reasoning, clinical judgment, problem solving, decision-making, and critical thinking (Benner et al., 2010; Tanner, 2006; Thompson & Dowding, 2002). While these concepts all include elements of both process and outcome, the concept of clinical reasoning specifically focuses on the thinking strategies that a nurse uses to make prudent judgments and resolve problems (Krautz, Kuiper, Pesut, Knight-Brown, & Daneker, 2005; Murphy, 2004).

Although the literature often uses the terms critical thinking, clinical reasoning, decision-making, and clinical judgment interchangeably, they are distinct and vary in meaning. These terms all explain nursing actions, but are different, with each providing its own meaning as described below. Critical thinking is purposeful, self-regulatory judgment that uses cognitive tools such as interpretation, analysis, evaluation, inference, and explanation on which to base a judgment (American Philosophical Association [APA], 1990). In nursing, critical thinking is the purposeful, nonlinear method of collecting, interpreting, scrutinizing, drawing conclusions about, presenting, and evaluating information that is both factual and belief-based (National League for Nursing Accreditation Commission, 2002). Clinicians use multiple cognitive processes when

employing critical thinking. Nurses use questioning, analysis, synthesis, interpretation, inference, inductive and deductive reasoning, intuition, application, and creativity; it is an independent and interdependent decision-making process (American Association of Colleges of Nursing [AACN], 1998). Critical thinking is a higher order of thinking using reflection, critical analysis, and cross-examination to define a patient's problem and to select the best clinical practices (Alfaro-LeFevre, 2013). While reflective critical analysis is important, it can lead to excessive thinking, which can prevent the acquisition of appropriate knowledge; nurses need multiple ways of thinking to move beyond reflective analysis and to incorporate clinical reasoning (Benner et al., 2010). Excessive thinking may cause a nurse to overlook or be distracted from the distinctiveness of the clinical situation. A nurse should develop salience and deliver a plan of care that is specific to the individual needs of the patient or clinical situation.

Clinical reasoning is the antecedent to clinical decision and action. A nurse collects cues, processes the information, comprehends the patient problem or situation, plans and implements interventions, evaluates outcomes, and reflects on and learns from the process (Kraischsk & Anthony, 2001; Lauri, Salantera, Chalmers, Elkman, Kim, Hesook, MacLeod, 2001; Levett-Jones, Hoffman, Dempsey, Joeng, Noble, & Norton, 2010; Tanner, Padrick, Westfall, & Putzier, 1987). Nurses use the gathered information to understand a clinical problem specific to the individual patient or situation, formulate a plan that includes patient outcomes and interventions, evaluate patient progress, and reflect on and learn from nursing actions (Lampkin, Levett-Jones, Bellchambers, & Fernandez, 2010). A nurse using this deliberate cognitive process makes inferences, generates alternatives, weighs them against evidence, and then chooses the most appropriate action (Simmons, 2010; Tanner, 2006; Tanner, Padrick, Westfall, & Putzier, 1987).

According to Benner, this intellectual process stands out as a situated, practice-based form of reasoning that relies on scientific and technological research-based knowledge; it is the capacity to discern the relevance of the evidence and its application to the individual patient (Mitchell, 2008). Clinical reasoning depends on the practitioner's ability to accurately assess and identify problems within the context specific to the individual patient or situation (Murphy, 2004; Simmons, 2010). In using clinical reasoning, a nurse considers the specificity of the patient, taking into account co-morbidities, sensitivities to care interventions, and individual preferences and concerns.

To reason clinically in nursing requires a multifaceted cognitive process, which uses formal and informal thinking approaches to gather and analyze patient information, evaluate the meaning and relevance of this information, and determine the value of alternative actions (Papathanasiou, Kleisiaris, Fradeloa, Kakaou, & Kourkouta, 2014; Simmons et al., 2003; Simmons, 2010). The clinical reasoning process is dependent upon the ability to think critically (Scheffer & Rubenfeld, 2000).

Nursing practice is reliant on situated comprehension and action. Clinical judgment is the deliberation and enactment of the nursing process. Nursing actions require familiarity with both the nursing process and scientific reasoning to promote optimal patient outcomes. These processes are complex in nature, are performed on the spot, and are specific for each individual patient. "Clinical judgments require that the professional be flexible and have the nuanced ability to recognize salient aspects of an undefined clinical situation, interpret their meanings, and respond appropriately" (Tanner, 2006, p. 205). The clinician must recognize the distinctiveness of the patient's responses to illness.

Clinical judgments require a firm knowledge base, meaning the comprehension of theory and its appropriate application. Knowledge is abstract, generalizable, and applicable in many situations and develops from a thorough understanding of science and theory. Clinical judgment improves with nursing experience because applying scientific concepts to clinical practice enhances the instant recognition of clinical states. This cognitive process is highly localized and individualized, drawn from knowing both the individual patient and collective human understanding (Benner, 1982, Benner 1984, Benner, 2004; Benner & Tanner, 1996; Peden-McAlpine & Clark, 2002; Tanner, 2006). Practitioner's prudent interpretation of clinical data with a thorough understanding of concepts related to health, illness, and human nature provides the foundation for safe nursing practice. Urgent clinical situations demand a definitive and swift response. The nurse must draw on knowledge, not abstract categories of clinical information, in order to act according to the demands of the clinical presentation and the best evidence for practice (Benner et al., 2010).

Multiple thinking strategies blend decision analysis and information processing to promote better patient outcomes. Critical thinking is essential for "on the spot" judgments. When combined with clinical reasoning skills, practitioners applying critical thinking are able to accommodate the dynamic nature of clinical settings (Tucker & Bradshaw, 2013). Those with under-developed clinical reasoning skills often fail to perceive or recognize imminent patient deterioration thus resulting in a failure-to-rescue (Aiken et al., 2003). Clinical judgment is reliant on sound reasoning because it is the conclusion of the cognitive process. The wrong conclusion can lead to adverse patient events.

Nurses diagnose human responses to illness by collecting, analyzing, and interpreting patient clinical data. For example, an elevated heart rate is an indicator of many clinical

situations; and increased heart rate is caused by many factors such as anxiety, pain, or shock. Clinical reasoning is evident when the nurse accounts for co-morbidities, prescribed regimens, and the specificity of the patient's clinical condition. A nurse comprehends the distinctiveness of this particular patient's human response to illness; the nurse collects and organizes data, seeking its relevance, then makes an inference and implements a plan of care. Nursing action necessitates multiple complex cognitive processes to draw upon theory, best-practice research, and ethics to provide best patient outcomes. Critical thinking is too expansive a term and does not delineate the various intellectual processes utilized in nursing practice.

Sepsis

Sepsis is a systemic inflammatory response induced by an infectious pathogen that initiates a physiologic response of increased respiration, temperature, heart rate, and white blood cell count. The physiologic responses clinically present in a continuum from sepsis, to severe sepsis, to septic shock. The clinical representation of these stages is progressive and can lead to death. Registered nurses must recognize the clinical deterioration early in order to improve patient outcomes.

Sepsis is the presence of infectious organisms in the blood stream, spreading throughout the body causing systemic physiological responses (Dellinger et al., 2012). Currently, sepsis affects over one million people; the national mortality rate is 28% and the risk of death varies with reported increases based on age, gender and race, costing hospitals 20 billion dollars per year **(**Center for Disease Control and Prevention (CDC), 2011). Sepsis is a potentially life-threatening complication of an infection, especially when left unrecognized. This illness not only creates a financial burden for healthcare but also significantly impacts patients and their families.

The identification of sepsis and the distinct progressive stages of sepsis, severe sepsis, and septic shock are a clinical imperative. Internationally recognized guidelines identify the response to infection, categorize clinical parameters for each stage of sepsis, and outline the bundled evidence-based practices used to address sepsis (Dellinger et al., 2012; Surviving Sepsis Campaign, 2014). Newly established incentive programs from the Center of Medicare and Medicaid Services delineate core clinical guidelines that are obligatory for hospital reimbursement (Morath, 2015).

Table 2

SIRS Criteria	**Sepsis**
Fever of more than 38°C (100.4°F) or less than 36°C (96.8°F) Heart rate of more than 90 beats per minute Respiratory rate of more than 20 breaths per minute or arterial carbon dioxide tension (PaCO 2) of less than 32 mm Hg Abnormal white blood cell count (>12,000/µL or < 4,000/µL or >10% immature [band] forms)	Suspected infection with 2 or more SIRS criteria **Severe Sepsis** Suspected or documented infection and organ dysfunction **Septic Shock** Severe Sepsis and persistent hypotension that does not respond to appropriate fluid resuscitation

Nursing assessment collects and organizes objective and subjective clinical data to diagnose human responses to medical conditions. The identification of sepsis is contingent on sound clinical reasoning and judgment. When infection develops in the body, the inflammatory response system ensues causing physiologic reactions; however, this pattern can occur in noninfectious conditions as well. The term systemic inflammatory responses syndrome (SIRS) delineates the clinical criteria. Sepsis is a systemic inflammatory response arising from a known or suspected infection, leading to widespread tissue injury, multiple organ damage and failure

(Bone, Balk, Cerra, Dellinger, Fein, & Knaus, 1992). The parameters for assessing SIRS include temperature, heart rate, respiratory rate, white blood cell count, and partial pressure of carbon dioxide (Table 2).

To identify sepsis a patient must present two or more of the SIRS criteria, along with suspicion of infection (Amland & Hahn-Cover, 2014; Morath, 2015). The responses to infection encompass three stages: sepsis, severe sepsis and septic shock (Table 2) (Dellinger et al., 2012; Surviving Sepsis Campaign, 2014). Specific bundled treatment protocols should be implemented for each stage of sepsis to prevent organ failure and death. Appropriate clinical management necessitates prudent nursing assessment and clinical reasoning.

Debriefing

The concept of debriefing was established in the military and the aviation industry; its action connotes questioning, interrogating, or examining. When used for military or aviation purposes, a pilot or soldier relays information after a mission, and then there is a factual review of events and individual and unit reactions to those events (Bartone & Adler, 1995). The post-mission analysis contains educational and operational objectives to improve strategies for combat and has become an essential teaching component in simulated military aviation training practices (Dismukes & Smith, 2000; Gururaja, Yang, Yang, & Chauvin, 2012).

Within the field of psychology, debriefing is used in crisis intervention for a traumatic event or natural disaster. Psychological debriefing is a one-time, semi-structured conversation; its purpose is to reduce any possibility of psychological harm by informing people about their experience or allowing them to talk about it (Hanna & Romana, 2007). This type of debriefing may also be used with research subjects to inform them how they were misled during an experiment. This approach ensures the participants are fully informed and are not harmed in any

way by their experience in an experiment, as psychological safety is of high importance (American Psychological Association, 2010).

Academic and professional education programs in medicine and nursing include simulation into curricula and uphold debriefing as an integral component of experiential learning. Simulation-based education in these programs enhance learning in a similar way by conducting debriefing conversations that are structured, supportive, and non-punitive. The use of guided reflections helps to clarify the assumptions of clinical actions and foster knowledge application for actual practice (Ahmed, Sevdalis, Guruaja, and Nestel, 2012; Arafeh, Snyder Hansen, & Nichols, 2011; Dreifuerst, 2010; Fanning & Gaba, 2007; Rudolph et al., 2013).

The debriefing process for healthcare simulation contains some of the characteristics of debriefings in military/aviation, psychology, and academia. Participants and facilitators review and discuss factual events: this is to make connections between the learner's actions and patient outcomes. This discussion engages the learner in an interactive process of guided reflection revealing the learners' thought processes (Cantrell, 2008; Wang, 2011; Waxman, 2010). In health care simulation, another aim of clinical debriefing is to uphold the emotional safety of the learner by guiding the learner with non-punitive questioning, therefore cultivating reflection and critique, while also endorsing compassion for the new learner. Debriefing is an effort to uncover clinical decisions without fear of ramification (Dreifuerst, 2009).

Psychological Safety

Immersion into a simulated scenario evokes emotional responses. Anxiety may be present in some individuals and is cognitively triggered by real or imagined and internal or external threats to an individual's security (Forchuk, 1991). Learning can be hindered if the learner feels humiliated or exposed by the simulated event, especially when the stance of the educator is

punitive instead of unveiling cognitive processes that lead to action or behaviors (Dreifuerst, 2009; Edmondson, Higgins, Singer, & Weiner, 2016; Rudolph et al., 2007, 2013; Rudolph, Simon, Dufresne, & Raemer, 2006; Williams, 2007). Educators should facilitate and create an environment that supports the psychological safety of the learner (INASCL, 2013, Standard V). Established psychological safety provides an environment of trust and boundaries, which allows the learner to feel accepted and respected. Barriers to learning arise when individuals perceive threats to self when taking risks that might embarrass or expose their vulnerabilities, thus inhibiting the ability to adapt or change (Edmondson et al., 2016).

Post simulation debriefing supports the emotional account of events that occurred, and fosters reflective analysis of the participants' actions (Jefferies, 2005, 2007). The educator values the learner's perspective as an individual trying to understand, recognize, categorize, and comprehend their reality instead of simply observing the learner as a performer of correct and incorrect actions (Schon, 1983, 1987). Establishing a safe environment removes the instructor from a disciplinary posture so that the learner can reflect and make links between action/inaction and theory (Lasater, 2007a; Waxman, 2010; Wickers, 2010). In psychology, the fundamental underpinnings for learning involve containing or reducing feelings of insecurity and threat while nurturing feelings of well-being and possibility (Rudolph, Raemer, & Simon, 2014).

In a health care SBE, clinicians participate in a reproduced patient scenario as they would in their professional role while colleagues and faculty observe. This type of experiential learning places these learners in a vulnerable position. Thus, it is imperative for the educator to promote a dialogue that reduces threats to professional and social identity especially when learning in groups (Edmondson, 1999). Participant engagement and learning are inhibited when psychological safety is not upheld. Psychological safety has been shown to be a predecessor to

learning behaviors such as asking questions, sharing one's thinking, and asking for help (Edmondson, 1999; Edmondson et al., 2016; Rudolph et al., 2014).

According to Rudolph and colleagues (2006), debriefing with good judgment is not the averting of performance errors and the associated emotions. When the environment is a psychologically safe container, negative emotions arising from mistakes can, in limited doses, help to motivate learning (Zhao, 2011). "In psychoanalytic disciplines, the metaphor of a safe container in which learners feel secure enough to be uncomfortable or trust that they will have help managing difficult feelings and anxiety has come to be recognized as an important feature of nurturing experiential learning" (Rudolph et al., 2014, p. 340). The open-ended dialogue during debriefing promotes reflection and assists in the comprehension of the actions performed; this facilitation helps make sense of the event and bridges gaps (Dismukes, Gaba, & Howard, 2006; Fanning & Gaba, 2007; Jefferies, 2007; Ramer et al., 2011). It also allows the expression of feelings and the release of emotional tension.

Rudolph, Raemer, and Simon (2014) recognized the absence of theoretical or empirical agreement on how to establish and maintain engagement in instructor-led health care simulation debriefings. The authors are experts in simulation and debriefing: their combined debriefing experience includes conducting more than 6000 debriefings and 2000 instances of coaching simulation instructors on the flow of pre-briefing to simulation to debriefing. They conducted a non-protocolized systematic search of the literature to review simulation and debriefing from various disciplines, including: aviation simulation, clinical learning, formative assessment, adult learning, organizational learning, deliberate practice, and the cognitive, emotional, and behavioral disciplines. The authors sought the opinions of additional experts in debriefing, psychological counseling, organizational learning, clinical and general education, and adult

behavior change. They then developed key words to use as search terms in clinical and social databases. Seventy-eight articles organized and framed a set of best practices.

Rudolph, Raemer, and Simon, (2014) identified essential principles that establish a psychologically safe learning environment for instructor-led health care simulation debriefings. “Providing a psychologically safe context includes the practices of clarifying expectations, establishing a ‘fiction contract’ with participants, attending to logistic details, and declaring and enacting a commitment to respecting learners and concern for their psychological safety” (p. 1). The aim is to build a safe container where learners can exhibit learning-oriented behaviors. These behaviors are: asking questions, sharing one’s thinking, and asking for help (Edmondson, 1999). The educators work in partnership with learners to perform these practices; consistency between what instructors say and do may also influence learners’ engagement.

Simulation-based education involves many components when replicating a clinical situation for the safe transfer of theory into clinical practice. Reflective inquiry exposes the learner to their actual clinical practice, allows concepts to be clarified, and links theory to practice (Jefferies, 2005). The aim for clinical debriefing is to guide the learner with nonjudgmental questioning, cultivating reflection and critique while also endorsing compassion for the new learner. A number of debriefing models or methods exist, causing variation in this teaching strategy. The purpose of this study is to compare two approaches for debriefing and measure the learner’s psychological safety using the visual analog scale.

Debriefing Methods

Debriefing approaches associated with simulation in healthcare aim to improve learning, future performance, and ultimately patient outcomes. The reflective dialogue must have a theoretical framework or structure that promotes purposeful reflective inquiry and guides the

debriefing discussion. The literature identifies several concepts that are important to debriefing. One concept identified by Rudolph et al. (2006) is “Debriefing with Good Judgment,” which forms the basis of the Advocacy and Inquiry (AI) model. This inquiry endorses rigorous self-reflection in order to reveal the learner’s internal frames for clinical decisions and behaviors. Providing feedback after a simulated scenario cannot be performed without some judgment by the observer. With this approach, the post simulation analysis is delivered in a conversational style and is presented from a position of genuine curiosity in conjunction with supportive dialogue about the participant’s actions. This Advocacy and Inquiry (AI) model has three aspects:

1) a conceptual model and reflective practice that guides the instructor on how to illuminate the mental models that were salient in guiding trainees’ actions during the simulation.

2) an underlying debriefing stance that unites the apparently contradictory values of curiosity about and respect for the trainee and the clear evaluative judgments about trainee performance.

3) the deliberate use of language to uphold advocacy and inquiry (Rudolph et al., 2006).

The instructor removes him or herself from the observed experience to avoid personal assumptions. The model’s primary aim is for the facilitator to voice reflective dialogue describing the observed actions or inactions during a simulated event thus revealing the participant’s internal frames while preserving the psychological integrity of the student. The conversation is not casual or affable but a coupling of advocacy and inquiry. According to Rudolph et al. (2006), advocacy is an assertion of observed actions and inquiry is the investigation of the educator’s hypothesis. The revealed cognitive frames afford discussion,

enable reflection, and challenge perceived actions; as a result, this approach assists the learner to scrutinize internal assumptions to foster reflective practice and self-correction.

One debriefing methodology that incorporates components of the AI model is the 3D Model of Debriefing: “Defusing, Discovering, and Deepening.” This method presents three evolving phases for post simulation analysis that begin with Defusing. This initial phase allows the learner to release emotion and describe the experience. The second phase, Discovering, prompts the learner to identify and analyze the mental models guiding behaviors and then compares them with new information introduced by participants or the educator. Finally, Deepening allows the learner to apply new information to the clinical environment (Zigmont, Kappus, & Sudikoff, 2011a). Educators probe into the rationale for certain behaviors using the aforementioned AI technique. Pairing objective observation with open, leading questioning exposes mental frameworks. The facilitator maintains a position of genuine curiosity to avoid making assumptions about internal frames that cannot be directly seen (Rudolph et al., 2006).

The aviation and military sectors’ methodology of debriefing has been customized for healthcare education. The Adaptation of the United States Army’s After-Action Review (AAR) debriefing format has been modified for healthcare simulation to include components of the AI model. The acronym DEBRIEF is used to frame the elements of this process. The AAR process includes seven sequential steps as follows:

1) Define the rules of the debriefing.

2) Explain the learning objectives of the simulation.

3) Benchmark performance.

4) Review what was supposed to happen during the simulation.

5) Identify what actually happened.

6) Examine why events occurred the way they did.

7) Formalize learning by reviewing with the group what went well, what did not go well, and what they would do differently if faced with a similar situation in real life

(Sawyer & Deering, 2013, p.390).

The guided discussion after a simulated clinical scenario is an essential period of self-reflection. The educator uses the three elements of AI to expose the internal frames that lead to behaviors, and provide an opportunity to revise imperfect mental models for future clinical practice.

Literature denotes debriefing as the single most important feature of simulation-based education (Groom, Henderson, & Sittner, 2013; Issenberg, McGaghie, Petrusa, Gordon, & Scalese, 2005; Jefferies, 2005, 2007; Levett-Jones & Lampkin, 2013; Neill & Wotton, 2011; Warwick, Hunsaker, Cook, & Waltman, 1979). Reflective dialogue enables insight as it fosters verbalized thinking, an explanation of rationales for action, and assists in the connection of clinical action to existing knowledge (Cantrell, 2008; Fanning & Gaba, 2007; Lasater, 2007; McCausland, Curran, & Cataldi, 2004; Rudolph et al., 2008). Debriefing reassembles concrete representations of clinical interventions and builds on existing knowledge to form cognitive representations of clinical problems through pattern recognition and cognitive inference (Neill & Wotton, 2011). Active interaction occurs between the educator and the learners; the reexamination of individuals' application of knowledge and skills and its congruence with safe and effective practice enhances learning (Dreifuerst, 2009, 2010; Rudolph et al., 2006; Waxman 2010; Wickers, 2010).

Although debriefing is an integral element of SBE, there is wide variation in faculty training, timing, structure, and design. Timing includes whether there is post simulation (terminal) or in-simulation (concurrent) debriefing. Structure of debriefing is the theoretical

framework or the approach of purposeful reflective questioning used to guide the debriefing discussion: for example, AI or 3D-DDD formats. Design contains length, location, and learning environment. Variations in timing, structure, and design can potentially influence an individual's ability to learn.

Debriefing Research

The importance of simulation and debriefing for promoting quality and safety in healthcare is widely recognized and has prompted research on the best practices for managing this experience. Several studies have proposed that a structured debriefing should occur immediately after simulation (Jefferies, 2007; Shinnick, Woo, Horwich, & Steadman, 2010; Van Heukelom, Begaz, & Treat, 2010). There are differing views regarding the ideal length of debriefing: some researchers have proposed that it be limited to ten minutes after forty-five minutes of simulation, while others have suggested it be three times longer than the length of the scenario (Arafeh, Hansen, & Nichols, 2010; Cantrell, 2008; Jefferies 2005, Jefferies, 2007). Researchers have also examined the location for debriefing: some researchers have recommended debriefing in the simulation room while others have used a separate location for a 20-minute debriefing (Arafeh et al., 2010; Cantrell, 2008; Jefferies 2005, 2007).

Although these studies support structured debriefing there is minimal research available on best practices (Fanning & Gaba, 2007; Fey, Scrandis, Daniels, & Haut, 2014; Neill and Wotton, 2011; Rudolph et al., 2007). According to The International Nursing Association for Clinical Simulation and Learning (INACSL), the educator should promote reflection. Reflective dialogue is the conscious consideration of the meaning and implication of an action, which includes the assimilation of knowledge, skills, and attitudes with pre-existing knowledge (Decker, Fey, Sideras, Cabarello, & Rockstraw, 2013). Skill in debriefing feedback is essential;

it helps the learner to reflect on mental frames and is critical to learning (Dismukes et al., 2006; Rudolph et al., 2007; Rudolph, Simon, Raemer, & Eppich, 2008). Learning without guidance could lead the learner to unknowingly transfer mistakes into their practice, repeat mistakes, focus only on the negative, or develop fixations (Decker et. al, 2013). The paucity of nursing research on evidence-based strategies for efficacious debriefing is a cause of concern considering the importance of simulation debriefing (Neill and Wotton, 2011).

The principle behind debriefing is to reveal all of the mental frameworks, or thought structures, that guided both the learner's and debriefer's actions (Arafeh, Hansen, & Nichols, 2010). Nursing researchers have explored the construction of debriefing and the strategies used to organize the structure of debriefing sessions, but there is a paucity of research on debriefing approaches and their theoretical frameworks.

Brackenreng (2004) explored students' perceptions in unstructured versus structured debriefing and found students preferred the structured "action/reflective component" approach. Kuiper, Heinrich, Matthias, Graham, & Bell-Kotwall, (2008) used the structure of the Outcome Present State-Test (OPT) model to improve clinical skills because of its focus on critical thinking, cognitive development, and reflection. The OPT clinical reasoning web and worksheet were the elements of the structure, but the researchers did not identify the debriefing discussion's theoretical framework or methodology. Cantrell (2008) interviewed a focus group of nursing students to assess learners' perceptions of learning between structured and non-structured approaches. In this study, the researchers characterized the debriefing as "oral debriefing" with videotaping; however, neither the method nor the attributes were clearly detailed. Childs and Sepples (2006) examined four laboratory simulation stations followed by a ten-minute debriefing

session, but did not describe the debrief approach. Lasater (2007a) examined the effects of high-fidelity simulation on the development of nursing students' clinical judgment using focus groups. Lasater (2007a) found that learners' prefer the educator to be truthful, supportive, and provide definitive comments; however, the researcher did not explain the debriefing discussion methodology. According to Waxman (2010), the debriefing facilitator should provide a safe environment by asking open-ended questions related to learning objectives and outcomes. These questions should be focused on a specific skill or behavior; this can uncover the rationales related to decision making.

Dreifuerst (2009) described the defining attributes of effective debriefing strategies in a concept analysis. The identified attributes were reflection of the experience, emotional release, reception, integration, and assimilation. These attributes parallel the work of Warwick, Hunsaker, Cook, and Walton (1979). Dreifuerst incorporated these attributes into a conceptual framework called debriefing for meaningful learning. To be successful, the facilitator frames a set of facts through reflective inquiry to explore the learner's internal assumptions and to help scaffold elements into concepts of familiar meaning; the aim is to have recall for future experiences (Dreifuerst, 2009; Rudolph et al.; 2006).

During debriefing sessions, the facilitator should discuss any inappropriate actions and have the responsibility of providing correction (Jefferies, 2007) while upholding the psychological safety of the learner (Rudolph, 2006, Rudolph , 2013). The behavior of faculty affects participants' emotional safety; there have been published studies that investigated the styles that influence debriefing behaviors (Dieckmann et al., 2009). When inadequately executed, debriefing has the potential to cause wrong learning and poor clinical judgment

(Dreifuerst, 2009). The debriefing environment needs to be safe and supportive; the educator should take a stance of genuine curiosity and represent a positive coach-like demeanor in verbal and non-verbal communication (Cantrell, 2008; Lasater, 2007; Rudolph et al., 2006; Rudolph et al., 2007). Facilitators can provide safe learning environments by demonstrating active listening skills, facilitating reflective discussion, using learning objectives, generalizing learning into broader contexts, and using a structured framework (Lusk & Fater, 2013). Learning satisfaction is higher with educators trained in the skill of debriefing (Hallmark, 2010). Although debriefing is an essential teaching strategy, the peer-reviewed literature remains scarce concerning best practices for training, approaches, and how effective specific methods are at achieving learning objectives and goals (Fanning & Gaba, 2007; Fey, Scrandis, Daniels, & Haut, 2014; Neill & Wotton, 2011; Rudolph et al., 2007).

In a systematic review, Neill and Wotton (2011) examined debrief structure, faculty demeanor, environment, and feedback method, timin,g and location. This review on high fidelity simulation in nursing education spanned from 2000-2010 and was representative of qualitative (Brackenreng, 2004; Cantrell, 2008; Lasater, 2007), mix methodology (Childs & Sepples, 2006; Kuiper et al., 2008); Wotton, Davis, Button, & Kelton, 2010), literature review (Waxman, 2010; Wickers, 2010) and concept analysis (Dreifuerst, 2009) approaches. Table 3 contains a summary of these research studies.

Neill and Wotton (2011) reviewed published research reports and revealed six main themes:

1) structured or unstructured debriefing (Brackenreng, 2004; Dreifuerst, 2009; Kuiper et al., 2008).
2) faculty debriefing demeanor (Cantrell, 2008; Lasater, 2007).
3) safe environment (Waxman, 2010; Wickers, 2010).

4) use of probing and cuing questions (Cantrell, 2008; Waxman, 2010; Wickers, 2010).

5) timing for debrief (Cantrell, 2008; Wotton et al., 2010).

6) allocation of time for debriefing (Childs & Sepples, 2006; Waxman, 2010; Wotton et al., 2010).

Table 3

Author	Sample size	Findings
Brackenreng, 2004	9 Nurse Educators	5 used unstructured, 4 used structured. A structured design was suggested as best practice as it provided more time versus an unstructured design. Participants valued debriefing as essential to learning.
Cantrell, 2008	11 senior students	Educator conduct/manner influences learning.Cuing and reflective questioning support learning.
Childs & Sepples, 2006	55 BSN and MSN-students	Learners recognize an adequate amount of time is to be designated for debriefing.
Kuiper et al., 2008	44 BSN-students	Structured debriefing provides the scaffolding for reflection after a simulated event.
Lasater, 2007	39 BSN-students	A faculty's demeanor affects the learner. Feedback is to be honest while endorsing the learner.
Wotton et al., 2010	300 3rd-yr. BSN students	Students preferred immediate debriefing from educator and favored debrief time of longer than 20 minutes.
Dreifuerst, 2009	Concept analysis	Structured debriefings promote suitable learning. The educator advocates for the learner by offering critique intended for improvement. Student strengths and learning are brought forward in a nonthreatening manner, using elements of formative assessment.
Waxman, 2010	Literature review of 6 articles	A safe environment includes the use of open-ended questions, a timeframe where debrief is twice as long as the simulation, and is to occur immediately after the event.
Wickers, 2010	Small literature review in a discussion paper	The instructor creates the safe environment by establishing trust and encouraging engagement by the use of supportive, probing, reflective questions.

In another study, Cheng, Eppich, Grant, Sherbino, Zendejas, and Cook (2014) examined debriefing characteristics in health care education in a systematic review and meta-analysis. The aim was to research studies that included technology-enhanced simulation in education and specifically addressed debriefing activities. Out of over ten thousand articles acquired from MEDLINE, EMBASE, and Scopus databases, only 177 (11,511 learners) studies met the criteria. Additional reviewers evaluated study quality and abstracted information on instructional design and debriefing outcomes. The study included nurses and nursing students (n=3757), postgraduate physicians (n=2990), and medical students (n=2428). Effect size was pooled using random-effects meta-analysis. The systematic review and synthesis of the evidence regarding the use of debriefing in SBE was inconsistent; only a small minority of studies described key debriefing characteristics and debriefing approaches reported mixed or non-significant results. (Cheng et al., 2014).

Cheng et al. coded the extracted data according to debriefing characteristics from Ramer et al.'s (2011) categories of key debriefing characteristics: (who) debriefer, (what) methods/content, (when) timing, (where) environment, and (why) theory. To these characteristics the researchers added duration and educator presence. The results showed that a limited number of studies had all these attributes. The researchers found the following characteristics in the literature: 77% of the articles examined (n=136) duration of debriefing, 13% (n=23) educator presence, 62% (n=109) educator characteristics, 19% (n=34) content of debriefing, 72% (n=127) structure and method of debriefing, and 7% (13) timing of debriefing. Less than 10% of all simulation studies involving debriefing compared one method or approach of debriefing with another.

Cheng et al. (2014) performed a comparative inquiry. The meta-analysis of four studies demonstrated the following: 1) video-assisted debriefing has insignificant effects for skills compared with non-video assisted debriefing (ES=0.10), 2) a non-significant effect in favor of expert modeling with short debriefing compared to lengthy debrief times (ES range= 0.21-0.74). The study concluded that simulation research has inconsistently and incompletely described key debriefing characteristics.

A nonsystematic, critical review of the literature using PubMed, CINAHL, Google scholar and hand searches of bibliographies identified key components to debriefing (Sawyer, Eppich, Brett-Fleeger, Grant, & Cheng, 2016). The sources encompassed descriptive/narrative reports, qualitative and quantitative experimental and quasi- experimental studies, literature reviews, systematic reviews, and meta-analyses. According to Sawyer et al. (2016), a debriefing conversation is a focused discussion using facilitation techniques and debriefing adjuncts. Dialogue techniques included advocacy and inquiry, guided team self-correction, and circular questions (Sawyer et al., 2016). Debriefing adjuncts included debrief scripts, video review, and co-debriefing.

Debriefing is a critical component in healthcare simulation and there is little research on debrief methods and best practice. The critical review spanned from June 2104 to October 2015. This nonsystematic review examined timing, facilitation techniques, conversational structures, and process elements used in healthcare simulation. The review process resulted in four key topic areas: timing, conversation facilitation, conversation structure, and process elements. Table 4 summarizes the topic areas' definitions, components, and some examples.

Table 4

Four topic areas for debriefing	
Timing	Definition – the time in debriefing occurs in relationship to the simulated event. <u>Timeframe</u> • Post simulation vs. during the event.
Conversation facilitation	Definition – the focused guided conversation exploring events that occurred; a discussion of relevant issues in alignment with learning objectives. <u>Types</u> • Facilitator-guided • Self-guided with the use of a cognitive aid
Conversation structure	Definition – the method of how facilitator-guided or self-guided debrief conversations unfold and can include three or more phases. <u>Examples</u> <u>3 phases methods</u> • Debriefing with good judgment - reaction, analysis, summary • 3D Model- defusing, discovering deepening <u>Multiple phases methods</u>

Four topic areas for debriefing	

	• Healthcare Simulation AAR- DEBRIEF
	  o Define rules
	  o Explain learning objectives
	  o Benchmark performance
	  o Review what was expected
	  o Identify what happened
	  o Examine why things occurred the way they did
	  o Formalize learning

Process elements	Definition – the crucial elements used to enhance the learning process and maximize the impact of the debriefing discussion. Essential elements are: • Psychological safety • Debriefing stance or basic assumption • Establishing debriefing rules • Shared mental model • Addressing learning objectives • Open-ended questions • Using silence

Healthcare institutions have adopted simulation-based education to help educate clinical professionals because it immerses the learner into a replicated event and promotes action without harming a real patient. SBE is an experiential event that helps to stimulate all the domains of

learning, but it is the debrief and feedback that is especially crucial for learning because it allows the individual to self-reflect and examine actions or inactions (Dismukes et al., 2006; Issenberg et al., 2005; Jefferies, 2005; Jeffries 2007; McGaghie, Issenberg, Petrus, & Scalese, 2010; Shinnick et al., 2010). Debriefing is a crucial teaching strategy; however, there remains minimal research on how to debrief or which methods are effective at achieving objectives (Fanning & Gaba, 2007). Because research on debriefing is limited, The International Nursing Association for Clinical Simulation and Learning (INACSL) has developed the Standards of Best Practice: Simulation. These standards are designed to "advance the science of simulation, share best practices, and provide evidence based guidelines for implementation and training" (INACSL, 2013). According to INACSL, the implementation of the Standards of Best Practice is a commitment to quality and the application of rigorous evidence based practices in healthcare education to improve patient outcomes. Table 5 outlines the criterion for the debriefing process.

Table 5

INASCL Standards of Best Practice: Simulation Standard VI: The Debriefing Process
Criterion 1: Facilitated by a Person(s) Competent in the Process of Debriefing
Criterion 2: Conducted in an Environment That Supports Confidentiality, Trust, Open Communication, Self-Analysis, and Reflection
Criterion 3: Facilitated by a Person(s) Who Observes the Simulated Experience
Criterion 4: Based on a Structured Framework for Debriefing
Criterion 5: Congruent with the Participants' Objectives and Outcomes of the Simulation-Based Learning Experience

Experiential learning submerges the learner into a "life-like" clinical situation to help motivate all spheres of learning and for the safe transfer of knowledge into a controlled clinical environment. The literature has established debriefing as integral to participants' learning and

many have recognized the need for further research in this area for best practice (Dreifuerst, 2009; Jefferies, 2005; Neill and Wotton, 2011; Zigmont et. al, 2011b). The purpose of this study is to compare the effects of two different debriefing methods on the nurse orientee's perception of psychological safety, satisfaction with development of clinical reasoning skills, and satisfaction with learning using the SSES instrument and VAS scale.

CHAPTER 3

Research Methods

Debriefing frameworks can affect learners' psychological safety, the growth of clinical reasoning skills, and gratification with learning**.** This chapter outlines the design, setting, sampling plan, variables, instruments and procedure, statistical plan, data management, and the protection of human subjects for this study.

Design

This quasi-experimental study used a posttest-only design to compare groups debriefed using two different methods. For this study, there was no control group or random assignment. The independent variables were two different types of debriefing: the 3D-DDD and DEBRIEF methods. The dependent variables were learner satisfaction with debriefing and reflection, clinical learning and clinical reasoning, and psychological safety. The researcher measured clinical reasoning by an examination with questions based on a case study. The administration of this exam immediately followed a simulation clinical learning experience and a debriefing session. A survey measured the learner's satisfaction with the simulation learning experience; the survey contained subscales that measured satisfaction with debriefing and reflection, clinical reasoning, and clinical learning. A visual analog scale measured psychological safety.

Setting

A simulation center was the setting for the research. The center is located in an urban area and is a department of the corporate university of a large health care system. The center provides interprofessional education and orientation for the various health care facilities within the system and serves over 60,000 employees.

The simulation laboratory suite includes the following: simulated hospital with patient rooms, control rooms, conference rooms, and debriefing rooms. The equipment in each simulated laboratory includes: three wall-mounted video cameras, an overhead microphone, a one-way mirror to observe the simulation scenario and its events while in the control room, an audio-video recording playback system, a high-fidelity human-like mannequin simulator (HHMS), and laptops with programming software for the HHMS. The physical layout of each hospital room includes: the HHMS, a patient bed, bedside table with patient supplies, simulated oxygen and medical air delivery, suction, and bedside monitoring.

The center offers interprofessional simulation-based programs. To provide consistency in simulation-based education, the center's faculty undergoes specific debriefing training. To date, all faculty have attended a mandatory simulation instructor course based on the Advocacy and Inquiry (AI) model of debriefing prior to leading a simulation learning experience.

Population

The population for this study included registered nurses newly hired into the health system network and nurses transferring between the network facilities who attended orientation more than 2 years prior to transfer. On average, there are two orientation groups brought through simulation monthly. The groups vary in size between 50 and 90 orientees who are from various professions, including registered nurses, nurse practitioners, and physician assistants. For the registered nurse participants, there was variation in their experience level with some being newly graduated and others with experience of six months or greater. Primarily these nurses were baccalaureate prepared but a smaller number hold an associate or masters’ degree.

Sample

The researcher obtained a convenience sample from an interprofessional orientation program over three months' time; this was the time needed to achieve a sufficient sample size. All registered nurses (RN) participating in the orientation program were invited to participate and there was no exclusion criterion.

A power analysis was conducted to estimate the sample size requirements. To compare two groups using independent sample *t* test, the power analysis indicated a sample size of 128 with 64 in each group was sufficient for a moderate effect size and a significance level of .05.

Instruments

The study included several instruments. The researcher collected demographic data using a printed form (Appendix A). The participants were asked to enter the following data: 1) age in years, 2) highest attained nursing degree, 3) experience as registered nurse in years, 4) whether the participant is new or transferring within the health system, 5) most recent clinical experience 6) ethnicity, and 7) gender.

To measure the learners' satisfaction with the simulation learning experience, the researcher used the 18-item Satisfaction with Simulation Experience Scale (SSES) developed by Levett-Jones (2011) (Appendix B). This psychometric instrument contains 18-items and includes subscales to measure learner satisfaction with debriefing and reflection (nine questions), clinical reasoning (five questions), and clinical learning (four questions). The tool uses a five-point Likert scale, with scores ranging from one (strongly agree) to five (strongly disagree).

Levett-Jones et al. tested the scale with sophomore year (n=268) and junior year nursing students (n=76) from one Australian university. The SSES demonstrated satisfactory internal consistency for the entire instrument ($\alpha = 0.77$), as well as for the subscales, which were:

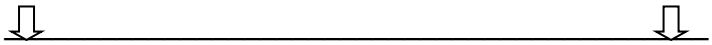
debriefing and reflection $\alpha = 0.94$, clinical reasoning $\alpha = 0.86$, and clinical learning $\alpha = 0.85$ (Levett-Jones et al., 2011). The researchers measured and compared the differences in satisfaction levels between two debriefing methods. The author has permission to use the tool (Appendix C).

A visual analog scale (VAS) measured the learner's perceived psychological safety. This type of scale is appropriate for measuring participants' subjective experience (Polit and Beck, 2012). The visual analog scale (Figure 2) was 100mm in length; the score ranged from one to ten. The provided directions instructed the participants to indicate with an "X" the degree of psychological safety experienced during debriefing. The definition of psychological safety was included with the VAS.

Figure 2.

The definition of psychological safety – the established environment provided boundaries and trust, allowing me to feel accepted and respected.

Please place an "X" on the line below that best scores the psychological safety you experienced *during* debriefing**.**



1 2 3 4 5 6 7 8 9 10

I DID NOT FEEL SAFE AT ALL ***I FELT EXTREMELY SAFE***

The researcher measured clinical reasoning by an examination with questions based on a case study. The participants completed the questions after experiencing a simulated scenario and a debriefing session. The exam questions pertained to sepsis recognition, clinical management, and communication. The learners read a case study and then answered ten multiple-choice

questions in ten minutes. The researcher developed the case study and exam. A panel of experts evaluated the exam for content clarity prior to first use.

Fidelity of Treatment

The simulation center provides a simulation instructor course using the Advocacy and Inquiry (AI) framework. The center mandates that all program faculty members successfully complete this course prior to the initiation of any Simulation-based education (SBE) program. In this study, the faculty consisted of a team of nurse educators. Nurse educators participating in the orientation program had successfully completed this course but had not been trained in the 3D-DDD or DEBRIEF methodologies.

The researcher developed the educational program for the faculty. The researcher is a Certified Healthcare Simulation Educator (CHSE) and trained as a rater for the Debriefing Assessment for Simulation in Healthcare© (DASH) tool. In addition, the researcher has acquired over three years' experience in debriefing interprofessional teams and has provided debrief training for two years.

The researcher trained the team of orientation faculty members in both the 3D-DDD and DEBRIEF approaches of debriefing. The methods of instruction included a reading assignment (Appendix D) for sepsis and the 3D-DDD and DEBRIEF methodology completed prior to the training session. The educators received class instruction outlining the components of the 3D-DDD and DEBRIEF methods. The researcher also gave an overview of the SIRS criteria and the stages of sepsis.

Next, the faculty viewed a training video that demonstrated each method of debriefing. The researcher was present when faculty members viewed the training videos to answer questions. The faculty was required to provide a return demonstration of both the 3D-DDD and

DEBRIEF methodology of debriefing; this was accomplished by having the faculty view a video of a simulated clinical event where the participants' practice was incorrect. The faculty demonstrated how they would conduct the debriefing following this event using the 3D-DDD and DEBRIEF methods. The researcher provided printed guidelines for each debriefing method to the faculty (Appendix E).

Protection of human subjects

In this study, the researcher took provisions to protect and maintain the privacy and confidentiality of the participants: no employment or personal identifiers were collected with the instruments and these were submitted anonymously. The researcher obtained IRB approval from Molloy College (Appendix F) and the North Shore-LIJ Health System (NSLIJ HS) (Appendix G). Participation in the study was voluntary.

The recruitment of subjects occurred on the first day during the introduction component of the orientation program. The researcher explained the purpose of the study, design, instrument, and the rights of the research subjects. The researcher then distributed consent forms (Appendix H), and the participants were allowed to read the consent form, and ask any questions regarding the study. The participants were informed of their rights as research subjects. Although the center requires all orientees to participate in the simulation experience and debriefing as part of their orientation, participation in this research study was voluntary. Those who intended to participate submitted a signed consent form, which the researcher then reviewed for completeness and placed in a designated secured collection box. The consented subjects then picked a card at random that indicated a numeric code; participants were instructed to enter this numeric code and the date into all research instruments.

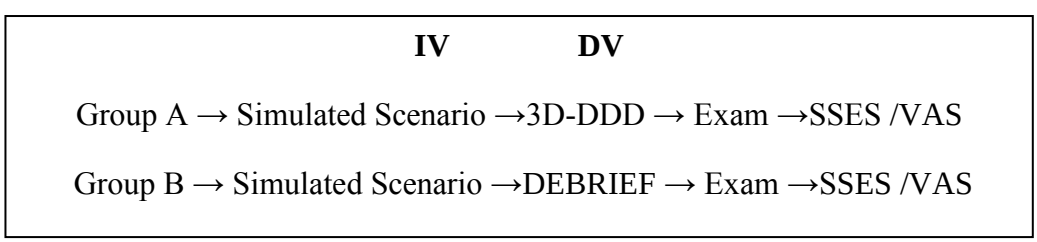
The study did not disrupt or manipulate the normal life experiences of subjects, incorporate any form of intrusive procedures, or involve deception. Subjects were notified they could withdraw at any time. The NSLIJ HS Employee Assistance Program was available to any individual with expressed or identified psychological distress.

Intervention

On hire, registered nurses attend a general orientation program that introduces them to the clinical practice of the healthcare system. This program has a multimodal approach; the curriculum contains lecture, online modules, skill practice, and simulated clinical scenarios. As part of this program, the orientees' participate in two simulated clinical experiences. These occur on day one and day three.

In this study, the researcher only collected data from the simulation experience conducted on day one of the orientation program. The researcher divided the sample into two groups, with one of the two methods of debrief used for each group. Group A received the 3D-DDD model and group B received the DEBRIEF method. Debrief methods alternated so that all orientation groups in each month were debriefed using the same method. All employees in each group who had agreed to participate were given a case study followed by a 10-question multiple-choice exam, the SSES with VAS, and demographic forms after each debriefing method. The researcher used the same simulated clinical scenario for both groups. Figure 3 displays the sequencing used for each group.

Figure 3.



Procedure for Simulation

Appendix I describes the preparation of the simulated environment. Laerdal software for SimMan™ was used to program the clinical events and trends for the replicated clinical scenario. The simulation center's staff programmed the scenario into the laptop computer for the HHMS. The researcher validated that the computer programming matched the written scenario's clinical script. The nurse educators ran the computer software program for the HHMS. The faculty performed the voice of the patient via the HHMS and answered the orientees' questions.

Nurse educators verbalized their fundamental belief that the orientation program would uphold the learner's psychological safety. This belief was that all learners are intelligent, talented, and caring professionals committed to excellence and self-improvement. During the introduction to the orientation program, the faculty shared this fundamental belief.

Prior to the orientation program, the faculty sent to all new hires an on-line video link to preview the simulated clinical setting and the use of the HHMS. The on-line introduction to the HHMS showed: the pupil responses; carotid, radial, femoral, and pedal pulses; heart, lung and abdominal sounds; cyanosis; vital signs; and the voice of the human-like mannequin simulator. In addition, on the first day of the orientation program the faculty introduced the simulated hospital room and patient simulator. The introduction included; the alcohol-based hand gel dispenser, the simulated sink, oxygen and medical air flow meter, bedside monitor for displaying pulse oximeter tracing, and the bedside nightstand equipment (nasal cannula, bag-valve mask, hand held nebulizer and linens). They also reviewed the placement of audio-visual equipment, which included the three camera units, microphone, and overhead intercom speaker.

Orientees attended this general orientation program prior to performing patient care for the clinical unit of hire. The faculty grouped the new hires into cohorts and each cohort remained intact during the formal orientation program. For simulation, each cohort divided into teams. The minimum number of members in a team was four. When the orientation group was large or when there were an odd number of orientees in a cohort, the number of members in a team increased to a maximum of five. The roles in the simulated scenario when there were four team members were: the primary nurse, secondary nurse, licensed practitioner, and a family member. Teams with five members included an additional familymember. The faculty handed out role cards facedown and the orientee self-selected the role (Appendix J). The faculty addressed any questions about the roles and later collected the role cards at the debriefing session.

The faculty explained a specific way in which the team entered the simulated scenario. First, the primary nurse entered the simulated environment. The secondary nurse, the licensed practitioner, and family member were instructed to enter the simulated environment only when the primary nurse directed the team to do so. The faculty addressed any questions about the team flow. At the start of the session, a faculty member escorted the primary nurse into the simulated environment and gave the nurse a bedside handoff (Appendix K). The nurse educator managed the voice of the patient and the laptop computer's HHMS program for the clinical scenario that represented severe sepsis (Appendix L). The announcement to begin and end the simulated case scenario was scripted (Appendix M). The simulated scenario ran for ten minutes and was measured by an electronic timer.

Procedure for Debriefing

Once the simulation session ended, the faculty escorted the orientees to the debriefing rooms. There were no video recordings of any of the simulation sessions; therefore, videos could

not be used during the debriefing sessions. The teams were debriefed using the 3D-DDD or DEBRIEF method based on the group assignment by month. The researcher gave the nurse educators debriefing guides for the 3D-DDD (Appendix N) and the DEBRIEF (Appendix O) approaches. The resource guide outlined the clinical parameters for the systemic inflammatory response system (SIRS) criteria during sepsis and the stages of sepsis (Appendix P). The length of the debriefing for each method was twenty to thirty minutes. An electronic stopwatch measured the time of debriefing.

Data Collection

At the end of each debriefing session, the consenting participants moved to a designated area and received an unmarked envelope that included the exam, the SSES with VAS, and a demographic form. Participants were instructed to write the numeric codes and the date on each of the forms in the packet. They were also reminded not to enter any employee identifiers on the forms. First, the participants completed the exam; they were given ten minutes and an electronic stopwatch measured the time. Then participants completed the remaining forms. The completed exam, instruments, and demographic form were returned to the envelope and then placed in a designated secured box. On leaving the room, the participants were instructed to discard the cards that contained the code numbers.

Subsequently, the educators provided feedback on the two debriefing methods. Once all simulation and debriefing sessions finished, the researcher sent an email with an electronic link to the faculty. Faculty members accessed the electronic link to read a consent form that explained the study and their rights as participants (Appendix Q). Those who agreed received instructions to activate the link to the electronic survey. The educators responded to five open-ended survey questions about the simulation learning experience and the 3D-DDD and DEBRIEF methods of

debriefing (Appendix R). The surveys were submitted anonymously with implied consent to participate for those who submitted a completed survey.

Proposed Analysis

The researcher manually entered the data from each instrument into the Statistical Package for the Social Sciences (version 20.0). Several statistical analyses proved useful in addressing the research questions. The researcher analyzed the demographic data to determine the characteristics of the sample, and computed the measures of central tendency and dispersion. All instruments were analyzed for reliability. The research questions that guided the study are:

- Is there a difference in posttest scores between participants who experience different debriefing methods following a simulation experience?
- Is there a difference in the participants' satisfaction in debriefing and reflection, self-reported clinical reasoning, and clinical learning for participants who experience different debrief methods?
- Is there a difference in the perception of psychological safety for participants who experience different debrief methods?
- What differences do faculty members describe between the two different debriefing methods?
- What influence have certain learner characteristics (i.e. culture, gender, age) on satisfaction in debriefing and reflection, self-reported clinical reasoning, and clinical learning for nurse orientees' who experience different debrief methods?

For the first three questions, the researcher used an independent sample t-test to identify whether there were significant differences between the mean scores of participants. The researcher descriptively analyzed the research questions on the faculty questionnaire. To identify significant

relationships between learner characteristics and the dependent variables, the researcher employed correlation procedures.

Procedure Data Management

All collected forms were stored in a secured and locked drawer and accessible only to the researcher. Any electronic data were stored on devices with password protection. The research data files did not contain any personal or professional identifiers; the files contained only the arbitrary numeric codes used on the instruments. This research data will be retained for a minimum of 6 years beyond the termination of the study. Results from this study may be published in a professional journal or may be presented at a professional meeting. Anonymity was maintained, as the participants cannot be identified in any way.

Conclusion

This study compared two different debriefing methods to determine significant differences in exam performance, learner's satisfaction with debriefing, clinical reasoning, clinical learning, and perception of psychological safety. The exam scores after 3D-DDD and DEBRIEF methods measured clinical reasoning. The SSES tool and its subscales measured the satisfaction with debriefing, clinical reasoning, and clinical learning. The VAS scores determined level of perceived psychological safety felt during debriefing. In these ways, the researcher ascertained and compared the effectiveness of the two debriefing methods.

CHAPTER 4

Results and Findings

In this study, the researcher examined the effect of an intervention on learners' development of clinical reasoning skills, satisfaction with learning, and perception of psychological safety**.** The researcher investigated registered nurses' responses on these variables after a simulation experience during an interprofessional orientation program. The 3D Model of Debriefing: Defusing, Discovering and Deepening (3D-DDD) and the DEBRIEF methods were the two types of debriefing methods investigated in this study**.** The researcher used a case study and exam to measure clinical reasoning skills after each debriefing method. After administering the instruments to Group A and Groups B, the researcher loaded the results into the SPSS program. Results for the sample and for each group were analyzed using t-tests and analysis of variance (ANOVA). Statistical analysis for each group revealed the relationships between the scores of the SSES, VAS, and case study using Pearson's correlations. Also the researcher examined the relationships of learner characteristics.

The researcher examined the relationships between a) age, b) gender, c) degree, d) years of experience, e) simulation-based education (SBE) experience, and f) race/ethnicity and the variables of interest. Both of the debriefing models in this study contain the advocacy and inquiry frameworks. The 3D-DDD model is a structured methodology outlining different phases of debriefing. The DEBRIEF methodology has the following actions incorporated into the process: Define rules, Explain learning objectives, Benchmarks for performance, Review what was supposed to happen, Identify what happened, Examine why, and Formalize learning.

The study included registered nurses participating in an interprofessional orientation program from May 2016 to August 2016. The researcher divided the sample of 149 nurses into

two groups: 67 nurses participated in the Simulation-based education with the DEBRIEF model; 81participants were in the group that debriefed using the 3D-DDD model. Assignment to groups was by the date the participants attended orientation.

The following research questions guided this study:

Q1. Is there a difference in posttest scores between participants who experience different debriefing methods following a simulation experience?

Q2. Is there a difference in the participants' satisfaction in debriefing and reflection, self-reported clinical reasoning, and clinical learning for participants who experience different debrief methods?

Q3. Is there a difference in the perception of psychological safety for participants who experience different debrief methods?

Q4. What influence have certain learner characteristics (e.g. culture, gender, and age) on satisfaction in debriefing and reflection, self-reported clinical reasoning, and clinical learning for nurse orientees who experience different debrief methods?

Q5. What differences do faculty members describe between the two different debriefing methods?

Description of the Participants

The research was conducted at a simulation center where there is a bi-monthly interprofessional orientation program. The orientation program is an introduction into clinical practice program (ICP) for registered nurses and mid-level providers. The population in the study consisted of registered nurses newly hired into the health system network or nurses transferring between the network facilities who attended orientation more than 2 years prior to transfer. For the registered nurse (RN) participants, there was variation in their experience level with some

recently graduated and others with more than 10 years' experience. Most of these nurses were prepared at the bachelor's degree level; however, a smaller number were diploma, associate's degree, or master's degree prepared.

One hundred forty-nine registered nurses voluntarily consented to participate. Participants in the study completed an exam with questions pertaining to a case study, and submitted a survey and a visual analog scale. The demographic data collected for the sample consisted of: age, gender, education degree, years of experience, hiring status, SBE experience, and race/ethnicity.

Most of the respondents answered the questions for age and gender. 141 registered nurses reported age. The range in age for this group was 42 years. The age of the youngest participant was reported as 21 years of age and the oldest participant was 63. Table 6 displays the distribution of this sample by age. The median age was 30 years and although there was a wide range in age, 56% of the sample were 30 years of age or less. One hundred forty-two respondents reported their gender; of these 92.3% were female and 7.7% were male.

Table 6

Age in Years and Percentages for the Sample

21-25 years	24.9 %
26-30 years	30.5%
31-35 years	16.3%
36-40 years	10.4%
41-45 years	7.1%
46-50 years	8.5%
>51 years	2%

The collected demographic data also included hiring status and level of education. Participants reported if they were transferring within the system or if they were newly hired. The majority of this sample of orientees was new to this healthcare system; 88% were just starting their employment, whereas 12% were transfers. The reported results for the highest level of nursing degree identified a variety of educational degrees achieved by participants in the sample. For educational preparation, only 2.1% reported having a diploma in nursing, whereas 13.3% held associate's, 74.1% bachelor's, and 10.5% master's degrees out of the 143 participants that reported on this variable.

Clinical experience ranged from less than one year to twenty-nine years. A total of 142 of the 149 participants reported the years of clinical experience as a registered nurse. The largest group of RNs, 34.9% of the sample, had less than one year of nursing experience. The distribution for the RNs with greater than one year of experience was: one to five years, 27.4%; five to ten years, 20.3%; and 12.6% reported greater than ten years of experience.

Participants answered questions about their clinical areas of nursing experience. The reported areas included working in homecare, medical surgical units, critical care/intensive care units (ICU), emergency departments, and oncology, psychiatric, maternal-child, and pediatrics units. The three areas of nursing experience with the largest distribution of participants were: medical surgical (35.4%), critical care (14.1%), and other (22.2%). Fifty percent of the 149 participants did not report an area nursing experience. Thirty-nine percent of the nurses reported less than one year of experience; this position for which they were being oriented was likely their first RN position.

The simulation learning experience was not new for some participants. Of the 143 responses to this item, 37.8% of the participants had simulation-based education (SBE) in

academic and employment areas, 35.7 % experienced simulation in the academic area, 11.9% of the group experienced simulation at an area of employment, and a small percentage (14.7%) did not have any experience with SBE. A total of 113 nurses rated their past simulation experience: 73.5 % reported the experience as positive, 21.2 % as neutral, and 5.3% as negative. This variable had the largest amount of missing data as 36 participants (24.2%) did not respond to this item.

The data from the 127 RNs who reported on race and ethnicity revealed some diversity in the sample; Table 7 displays this data. The results indicated that 55.9% were White, 18.1% were Asian, 15% were Black African American, 6.3% were Hispanic/Latino, 3.9% were Multiracial, and 0.8% were Native Hawaiian or Pacific Islander. The largest group represented in the sample was White-Non-Hispanic. This variable had missing data for 22 participants; 14.8% did not report race/ethnicity.

Table 7
Race Ethnicity

Categories	Frequency	Valid Percent
Asian	23	18.1
Black African American	19	15.0
Native Hawaiian or Pacific Islander	1	.8
Hispanic or Latino	8	6.3
White	71	55.9
Multiracial	5	3.9
Total	127	100.0

The researcher conducted further analysis to identify if there were statistically significant differences in the demographic variables between the two debriefing groups. A convenience sample was a known limitation to the study; participants were assigned to groups according to

date of hire. The highest educational degree earned by the participants was the only demographic variable for which there was a statistically significant difference between the two groups. A Chi-Square test for independence revealed a significant relationship between group and degree earned χ^2 (3, n =143)) =12.923, p=.005. The Cramer V indicated that this was a small effect size. Upon further investigation, the researcher determined that all three of the participants who reported having a diploma in nursing were in the 3D-DDD group; this group also had a larger percentage of nurses with an associate's degree when compared to the DEBRIEF group.

Examination Results for the Sample

Immediately after a simulated scenario and debriefing, participants completed an examination. For this examination, participants read a case study then answered ten multiple-choice questions. There was a forced answer for each question; there were no short answer responses. The exam focused on sepsis, stage of sepsis recognition, interventions, and communication. The mean score for the sample of 147 participants who completed this exam was 45%. Fifty-one percent of the group scored 40% or less. The scores for other participants were as follows: 21.8% scored a 50%, 18.4% scored a 60%, 7.5% scored a 70%, 0.7% received a score of 80%, and 0.7% received a score of 90%. The achieved overall mean was below the passing score for the exam, which was set at 70%. Table 8 lists the results for each of the posttest items.

As evidenced by the results displayed in Table 8, five of the scores hovered around the midpoint. For item four, which had the lowest score (6.2%), the participants needed to recognize the stage of sepsis; in this question the patient was experiencing severe sepsis. The scores for items three, seven, and ten indicate knowledge gaps in the clinical indicators of sepsis, antibiotic use, and the 2-challenge rule. Conversely, in item nine, most nurses (96.6%) correctly identified

the use of the Situation, Background, Assessment, Recommendations (SBAR) format to communicate concern over worsening clinical condition to the practitioner.

Table 8
Case *Study Posttest Question Results*

Questions and correct answers	Total Valid N	Valid Percent
1. The criteria used to determine sepsis: *Systemic Inflammatory Response System	147	44.9
2. Number of predisposing risk factors associated with sepsis: *Three	146	56.2
3. Select the specific clinical data used to indicate sepsis: *White blood count, heart rate, respiratory rate, temperature	148	33.8
4. The case study above represents a patient presenting with: *Severe Sepsis	145	6.2
5. Organizing the plan of care the nurse would first: *Perform lactate and 2 blood culture	148	43.2
6. What management would be most appropriate for this stage? *Admin of normal saline 500ml in15 mins, broad spectrum antibiotics and repeat lactate	148	50
7. Which of the following regarding blood cultures and antibiotics is false? *Adopting organized and clustered therapies worsens pt. outcomes	148	33.8
8. The patient (pt) received antibiotic therapy and intravenous fluids; vital signs worsen and the patient has not voided, and becomes confused to place and time, patient's condition is: *Septic shock	148	60.8
9. The RN is concerned with the worsening clinical condition. The RN best communicates to the practitioner by: *SBAR	148	96.6
10. The practitioner does not order additional therapies and recommends reassessing vital signs, level of conscious and urine output in 30 minutes. RN is concerned with the recommendation provided. Next best method of communication is: *2 challenge rule	148	29.1

Additional analyses of examination results.

The researcher conducted further analysis to ascertain if there were relationships between the demographic variables and the case study scores. Pearson Correlation analysis revealed no significant correlation between age, gender, and number of years of experience with performance on the case study exam. However, there was a statistically significant positive correlation

between hiring status and scores on the case study exam (r = .17, n = 141, p = .04). The mean for the participants who were transferring within the network's facilities was higher than the mean for those who were just beginning their employment in the healthcare system, but the transfers were fewer in number. It is plausible that those participants who had been working in the healthcare system would be more familiar with the sepsis protocol in use. The researcher performed an analysis of variance (ANOVA) to determine if there was a relationship between the case study score and each of the variables with multiple categories including area of previous RN experience, previous SBE experience, ethnicity, and highest nursing degree earned. There were no statistically significant relationships between area of previous RN work experience and previous SBE experience and the case study score. The researcher did note a statistically significant relationship in the case study scores by ethnicity, but post hoc analyses could not be performed for ethnicity because there was a group with less than two people. Under these circumstances, the accuracy of the ANOVA could not be established. The researcher also performed an ANOVA that revealed a statistically significant relationship between case study scores and nursing educational degree: F (3,138) = 3.4, p =.02. The post hoc analysis revealed a statistically significant difference between the three nurses in the diploma category and the associate's degree and the master's degree nurses. The discrepant numbers in the diploma category as compared to the other degree categories limit the ability to interpret the ANOVA results in this case.

Instrument Results for the Sample

The Satisfaction with Simulation Experience Scale (SSES) measured learners' satisfaction with the simulation learning experience. The SSES instrument contains 18-items and includes subscales to measure learner satisfaction with debriefing and reflection, clinical

reasoning, and clinical learning. The Cronbach reliability statistics for the 18 items resulted in α of .917. The tool has a five-point Likert scale, with scores ranging from one (strongly disagree) to five (strongly agree). A total of 149 instruments were collected; 137 (91.9%) of the participants responded to all 18 items, while 12 (8.1%) of the participants omitted from one to four items on the instrument. The mean score for the Likert-scale responses on the survey was 4.38. Inter-item correlations mean was .544. Table 9 displays participants' responses to the SSES.

Table 9

Satisfaction with Simulation Experience Scale Scores

Debriefing and Reflection	Valid N	Mean	SD
1. Facilitator provided constructive criticism	147	4.37	.812
2. Facilitator summarized important issues	145	4.56	.686
3. Had opportunity to reflect on and discuss my performance	147	4.51	.806
4. Debriefing provided opportunity to ask questions	147	4.49	.855
5. Facilitator helped develop my clinical reasoning skills	144	4.65	2.60
6. Reflecting on & discussing simulation enhanced learning	145	4.57	.798
7. Facilitator questions helped me learn	146	4.55	.771
8. Received facilitator feedback during debriefing helped me learn	144	4.45	.860
9. Facilitator summarized important issues	147	4.59	.792
Clinical Reasoning	Valid N	Mean	SD
1. Simulation developed clinical reasoning skills	147	4.26	.812
2. Simulation developed clinical decision making ability	147	4.17	.686
3. Simulation enabled to demonstrate clinical reasoning skills	145	4.18	.806
4. Simulation helped recognize patient deterioration early	147	4.20	.855
5. This was valuable learning experience	146	4.39	.858
Clinical Learning	Valid N	Mean	SD
1. Simulation caused me to reflect on my clinical ability	147	4.26	.812
2. Simulation tested my clinical ability	145	4.17	.686
3. Simulation helped me to apply what I learned from case study	146	4.18	.806
4. Simulation helped me to recognize my clinical strengths and weaknesses	147	4.20	.855

The SSES results indicated that participants were satisfied with the simulation learning experience. Since this scale did not specifically address an individual's perception of

psychological safety, the researcher developed a visual analog scale (VAS) to measure the learner's perception of psychological safety (Figure 2). Specifically, the participants were asked to mark the level at which they felt the environment had provided boundaries and trust, allowing them to feel accepted and respected. The scale ranged from one to ten. Overall, the mean for the 148 participants that entered a value on this scale was 9.23 with a *SD* of 1.13. Eighty percent reported a nine or higher, indicating that they perceived a high level of psychological safety. Twenty percent selected an eight or below on the VAS, indicating that these participants did not perceive as high a level of psychological safety.

Table 10
3D-DDD Correlations

Instruments	N	Pearson Correlation	Sig. (2-tailed)
VAS and SSES	62	.641**	.000
VAS and Case Study Score	66	.160	.200
Case Study Score and SSES	61	-.060	.647
**Correlation is significant at the 0.01 level (2-tailed).			

Table 11
DEBRIEF Correlations

Instruments	N	Pearson Correlation	Sig. (2-tailed)
VAS and SSES	75	.297**	.01
VAS and Case Study Score	81	.025	.822
Case Study Score and SSES	75	.098	.405
**Correlation is significant at the 0.01 level (2-tailed).			

In further statistical analysis, the researcher explored the relationship between the scores of the instruments. A Pearson's correlation was conducted between the mean scores of the case study, SSES, and the VAS. There was a positive and significant correlation for all respondents between their VAS score and their SSES average scores (r=.426, n =137, *p* =.000). There was no significant correlation between the VAS and participants' case study scores (r =.081, n = 147, *p* =.326) and the SSES average and case study scores (r = .041, n = 137, *p*=.637). Correlations

between the scores of the VAS, the SSES, and the case study were performed for the 3D-DDD (Table 10) and the DEBRIEF (Table 11) groups.

The 3D-DDD group scores showed a positive and significant correlation (r=.641, p=.000) between their VAS score and their survey average scores. Similarly, the DEBRIEF group VAS and the survey average had a positive and significant correlation (r=.297, p=.001).

Research Question One

Question 1: Is there a difference in posttest scores between participants who experience different debriefing methods following a simulation experience?

The researcher analyzed the scores on the case study examination for each sample using an independent samples *t* test. The results for each model were as follows: DEBRIEF (M=44, *SD* 15) and the 3D-DDD (M=47, *SD* 14), *t* (145) =1.09, *p*=.279. The mean difference in the two scores was 2.688 with a 95% confidence level ranging from a lower bound of -2.19 to an upper bound of 7.57. There was no significant difference between the people who were in the DEBRIEF and 3D-DDD groups regarding how they scored on the case study.

The passing score for the case study was a score of 70%. The DEBRIEF method had 81 participants. Only 7.5% of the DEBRIEF group had passing scores and 92.6 % received a 60 or below. The 3D-DDD model had 66 participants; 10% passed the case study exam and 88% received a score of 60 or below. Although the sample had variation in age and in the years of work experience, there were no identified statistically significant relationships between previous work experience and age and the case study scores in either group.

Research Question Two

Question 2: Is there a difference in the participants' satisfaction in debriefing and reflection, self-reported clinical reasoning, and clinical learning for participants who experience different debrief methods?

Independent sample *t* tests compared the scores of the SSES's subscales – debriefing and reflection, clinical learning, and clinical reasoning – between the two debriefing methods. The results indicated that there were no statistically significant differences between the two groups for each of the subscales. The results for the survey subscale of debrief and reflection were: 3D-DDD (M=40.67, SD=5.28) and DEBRIEF (M=40.15, SD=7.83, *t* (145) =.464, *p* =.643, two-tailed). The results for the clinical learning were: 3D-DDD (N=67, M=17.15, SD=2.88) and DEBRIEF (M=16.6, SD=3.5), t (145) =.909, *p* =.365 two-tailed). The clinical reasoning results were: 3D-DDD (M=21.3, SD=3.60) and DEBRIEF (M=20.94, SD=4.22), t (145) =.598, *p* =.551 two-tailed).

Research Question Three

Question 3: Is there a difference in the perception of psychological safety for participants who experience different debrief methods?

The researcher measured the perceived level of psychological safety for each debriefing method using a visual analog scale (VAS); the score indicated the degree of psychological safety experienced during debriefing. Independent sample *t*-test compared the VAS scores for the groups debriefed the different methods. For this variable, the Levene's test for equality was significant between the two groups; therefore, the variances between the two groups were not equal. When using the values for equal variances not assumed, the result was not significant. The results for this independent sample *t*-test were: 3D-DDD (M=9.0, SD=1.6) and DEBRIEF

(M=9.42, SD= 0.97) t (103.9) = *p*.065, two-tailed). The magnitude of the differences in the means (means difference = -.420, 95% CI-.866 to .026) was very small (eta squared = .02). Discrepancies in the sample size between the two groups may have contributed to the range in variances between the two groups.

Participants in the DEBRIEF group's VAS scores showed that 84% felt psychologically safe with scores reported above nine and 16% of the respondents scored an eight and lower. The results for the 67 participants in the 3D-DDD method had 76% of its scores greater than nine and 24% had VAS scores of eight or less. When comparing the two groups, a greater percentage of participants in the DEBRIEF group reported higher scores, but the difference in the means between the two groups was not statistically significant.

Research Question Four

Question 4: What influence have certain learner's characteristics (e.g. age, gender, and ethnicity) on satisfaction in debriefing and reflection (DR), self-reported clinical reasoning (CR), and clinical learning (CL) for nurse orientees who experience different debrief methods?

The study used Pearson's correlation coefficients to analyze the relationship between age and learners' satisfaction using the subscales score of the SSES and the VAS scores. The correlations results for the overall SSES survey scores and age indicate no statistically significant differences (r = - 0.13, n =131 p= .825). There were no significant relationships between participants' age and the SSES' subscales: DR (r = -0.001, n=140, p=.989), CR (r = -.032, n = 140, p=.709), CL (r =.063, n = 140, p=.462), and VAS scores (r = -0.89, n = 141, p= .289).

One hundred and forty-two reported their gender: of these 92.3% were female and 7.7% were male. An independent *t*-test showed there were no differences between sex/gender for debriefing and reflection, self-reported clinical reasoning, and clinical learning. The results for

gender for DR scores were: males (*n*=10, M=38.50, SD=5.986) and females (*n*=131, M=40.31 SD=6.67; *t* (139) =.832, *p*=.407, two-tailed). The CR scores were: males (N=10, M=21.30, SD=3.093) and females (N=131, M=21.11, SD=4.034; *t* (139) = -142, *p*=.887, two-tailed). Nursing orientees' scores for CL according to gender were: males (N=10, M= 21.3, SD=3.093) and females (N=131, M=16.85, SD=3.340: t (139) = -.321, *p*=.749, two-tailed). The VAS scores for males (N=10, M=9.18, SD=1.079) and females (N=131, M=9.24, SD=1.34, t (140) = .131, *p*=.896, two-tailed) were also not significant. The magnitude of the difference in the means for each of the SSES subscales and VAS tool was very small as was the number of males in the sample.

The differences in means for the subgroups by ethnicity and educational preparation and the SSES' subscales, and VAS tool were also analyzed. An Analysis of Variance (ANOVA) examined the effect of degree and ethnicity had on learners' satisfaction reported on the survey subscales: debriefing and reflection (DR), self-reported clinical reasoning (CR), and clinical learning (CL) and number reported on the VAS. For the DR and the VAS, the Levene statistic was significant indicating that the variance was not homogenous. The only analysis that yielded statistically significant results was for the DR variable by ethnicity but post hoc test could not be conducted because some ethnic groups had few participants. The low number of participants in certain ethnic groups and the lack of homogeneity of variance on the DR affect the accuracy of ANOVA.

Research Question Five

Question 5: What differences do faculty members describe between the two different debriefing methods?

Eight faculty members for the interprofessional orientation program received training for both debriefing methods, but only six participated in the study. The faculty described the perceived differences between the two different debriefing methods with a narrative response using an electronic survey. The group was 100% female, the ages ranged from 35 to 60 years, and they were all master's prepared nurses. They also reported race and ethnicity: two were White, one was Asian, one was Black/African American, one was Native Hawaiian/other Pacific Islander, and one was Hispanic/Latino. The number of years as a nurse educator ranged from one to forty years. The researcher collected data for years of experience with simulation-based education (SBE) and the responses varied. SBE experience ranged from one year to 17 years of experience, three had one year, one educator reported three years, another seven, and the most experienced answered 17 years.

The survey questioned educators about the positive attributes of the 3D-DDD model. Humanism was the common theme identified for this debriefing model. The respondents expressed that simulation can be anxiety provoking and this model has a focus of humanism that facilitated learner discussion in a safe environment container. In summary, the educators responded that the 3D-DDD was a humanistic method that takes into account the learner's perception especially when identifying performance gaps and helping to promote reflective thinking. The educators expressed that the most challenging components of the 3D-DDD model were: 1) expression of emotions and having the learner explore their feelings in front of a group and 2) asking the open-ended questions to deepen conversation to express those feelings related to simulation.

The researcher also obtained faculty opinion on the positive attributes of the DEBRIEF model. Responses from the educators stated that the positive features of DEBRIEF model were:

1) it was structured and systematic, easy to use, 2) provided a greater focus on clinical aspect rather than a humanistic approach, and 3) the “Benchmarking” and “Review” gave an opportunity for discussion and dialogue centered on learning objectives. The most challenging components of the DEBRIEF model were: the lack of a humanistic approach, the inability to keep the conversation focused to meet the time constraints, and having the opportunity to have the learners reflect like the 3D-DDD model. Two educators did not find this model challenging; one of these educators reported having less than one year of experience and the other had seven years of experience.

The survey asked the educators to report which debriefing method they believed led to the achievement of the learning outcomes and to give examples. The learning objectives for the scenario were teamwork, communication, and recognition of sepsis and its stage. Two educators responded that both methods were equal for promoting achievement of the stated learning outcomes and one stated that the 3D-DDD model was better, but did not give an example. One respondent expressed that the 3D-DDD model provided the best learning outcome, however the educator defined the learning as more participant interaction during debriefing and not achievement of specific learning objectives. Similarly, another response indicated the 3D-DDD as the preferred model, not because of the stated learning outcomes, but because participants were able to verbalize individual feelings about clinical practice when meeting the needs of the patient and family.

The educators answered questions about what changes they believed were needed in the simulated scenario. One of the reported observations was that the case had subtle signs of sepsis which made it difficult to assess. Other recommendations were: 1) to use the IPASS the BATON for the patient report, 2) create a sense of urgency by increasing the patient symptoms, and 3)

have doctor available. The interprofessional program does not provide orientation for physicians however; nurse practitioners and physician assistants participate in the simulation as mid-level providers (Appendix J).

The SIRS criteria and sepsis indicators were the clinical guidelines used to program the clinical case (Appendix P). The patient's initial symptoms (Appendix L) included three SIRS clinical indicators. The simulated scenario was programmed for ten minutes; this was to allow the participants the opportunity to recognize, report, and to treat the clinical condition of progressing sepsis. The simulated patient in the scenario had elevated temperature, respiratory rate, a source of infection, low blood pressure, and a change in mentation to indicate sepsis progressing to severe sepsis over a four-minute timeframe.

The final item on the survey asked the educators to specify what changes could be made to the debriefing methods. The responses from three of the educators focused on the simulation experience held on the fourth day of the orientation program, and did not address the debriefing that this study examined. One educator responded "none", and one other suggested increasing the debrief time to 30 minutes. The last respondent identified the DEBRIEF method as the preferred model.

The survey items obtained data on the faculty's perceived level of competency with the 3D-DDD and DEBRIEF methods. Each educator reported the same level for each method of debriefing; these were described as advanced beginner (N=2) and competent (N=1), novice (N=1), comfortable (N=1) and good (N=1).

The survey responses provided by the educational team described what differences they identified between the two different debriefing methods. The six faculty members were a diverse group with variation in age, level of nursing education experience, SBE experience, and

ethnicity. The results from the survey described the educator's perception of the attributes and challenges of each debriefing method. Although two educators described that both methods met learning objectives, they preferred the 3D-DDD approach. According to the survey's results, the DEBRIEF methodology provided structure, a focused dialogue, and the "Benchmarking and Review" centered the conversation on learning objectives; however, this method did not allow the learners to express feelings or reflect on the simulated event. The 3D-DDD model was described as a humanistic approach because participants were able to verbalize individual feelings, and for this reason, the orientation program adopted this model.

Summary

The researcher designed this study to compare the effect of two different debriefing methods on learner's development of clinical reasoning skills, satisfaction with learning, and perception of psychological safety. The 3D Model of Debriefing: Defusing, Discovering, and Deepening (N=67) and the DEBRIEF (N=81) method were the two debriefing methods examined during an orientation program for registered nurses hired into a healthcare system. The researcher used a case study exam to measure clinical reasoning skills. The researcher examined the differences in the scores for the Satisfaction with Simulation Experience Scale (SSES) to ascertain if there was a difference in satisfaction in debriefing and reflection, self-reported clinical reasoning, and clinical learning for participants debriefed using the different debrief methods. A visual analog scale (VAS) measured self-reports of psychological safety. The researcher also investigated whether there were relationships between certain participant characteristics and exam performance, satisfaction with learning, and perception of psychological safety.

CHAPTER 5

Summary

Introduction

The purpose of this quasi-experimental study was to compare how two different debriefing methods affected nurse orientees' development of clinical reasoning skills, satisfaction with debriefing and reflection, satisfaction with learning, and perception of psychological safety. The two debriefing methods investigated during the interprofessional orientation program were the 3D Model of Debriefing: Defusing, Discovering and Deepening (3D-DDD) and the DEBRIEF method. Both of the debriefing models used in this study contain the advocacy and inquiry framework.

A simulation center was the setting for the research. The center provides interprofessional education and orientation for the various health care facilities within a very large health system network. The researcher obtained a convenience sample from this interprofessional orientation program. This program was chosen because the orientation program is conducted at regular intervals and a large number of nurse orientees participate each month. The researcher conducted this study over a three month period.

The researcher trained the orientation faculty in both the 3D-DDD and DEBRIEF approaches of debriefing. The simulated case represented a patient with sepsis progressing to severe sepsis. The researcher provided resources for the educators in a binder for each simulation based education (SBE) session. Resources included scripts for the case (Appendix L), handoff (Appendix K), and debriefing method (Appendix N, Appendix O). Also, participants' role cards (Appendix J), and the SIRS criteria and clinical indicators for the stages of sepsis (Appendix P) were included.

The researcher divided the sample into two groups with each group using one of the two methods of debrief. Group A received the 3D-DDD model and Group B received the DEBRIEF method. Debrief methods alternated so that all orientation groups in each month were debriefed using the same method. All employees in each group who had agreed to participate received a case study followed by a 10-question multiple-choice exam, the survey instrument with a visual analog scale (VAS) (Figure 2), and demographic forms after each debriefing method. Participants signed a consent form (Appendix H) prior to filling out the instruments.

The researcher used the Satisfaction with Simulation Experience Scale (SSES) (Levett-Jones, 2011) to measure satisfaction with SBE (Appendix B). The researcher obtained the author's consent (Appendix C). This psychometric instrument contains 18-items and includes subscales to measure learner satisfaction with debriefing and reflection, clinical reasoning, and clinical learning. The tool uses a five-point Likert scale, with scores ranging from one (strongly disagree) to five (strongly agree).

Levett-Jones (2011) tested the instrument in a study with second and third year nursing students. Levett-Jones designed the tool to measure and compare differences in satisfaction levels between nursing students exposed to medium and high fidelity human patient simulation manikins. In the original study, the scale demonstrated satisfactory internal consistency (alpha 0.77). Exploratory factor analysis yielded a three-component structure termed Debriefing and Reflection, Clinical Reasoning, and Clinical Learning; each subscale demonstrated high internal consistency: 0.94, 0.86, and 0.85 respectively.

Since the scale demonstrated satisfactory internal consistency and construct validity, the researcher used the instrument with nurse orientees to measure satisfaction levels for debriefing and reflection, clinical reasoning, and clinical learning. The SSES does not measure perceived

psychological safety. The researcher developed a VAS measurement tool for participants to measure the level of psychological safety.

The instrument also did not measure clinical reasoning skills. The researcher developed a case study followed by an exam; this was the instrument used to measure clinical reasoning. The case study focused on the recognition of Systemic Inflammatory Response Syndrome (SIRS) criteria and stage of sepsis, interventions, and communication. The literature supports that debriefing is where learning takes place (Fanning & Gaba, 2007; Gaba, 2004; Van Heukelom et al., 2010). The researcher used the case study and exam to measure the application of clinical reasoning skills after participation in a debriefing with either the 3D-DDD or DEBRIEF method. The researcher used a demographic survey (Appendix A) to collect data for age, gender, educational degree, years of experience, clinical area of experience, hiring status, previous SBE experience, setting of SBE experience, rating of previous simulation-based education (SBE), and race/ethnicity.

Educators provided feedback on the two debriefing methods. Once all simulation and debriefing sessions were completed, the researcher sent an email with an electronic link to an anonymous survey (Appendix Q) to the faculty. The educators responded to five open-ended survey questions about the simulation learning experience and the 3D-DDD and DEBRIEF methods of debriefing (Appendix R). The researcher surveyed the faculty in this way because they were only six of them and it was thought subjective data would provide a different perspective and insight.

Discussion

The demographic data collected indicated that although there was a range of responses on many of the variables, there were larger groupings in some participant characteristics. When

considering several factors, the distribution of the demographic variables of this sample was representative of the nurses that attend the interprofessional orientation program for this network. The largest proportion of participants in this sample was under 30 years of age and reported having less than one year of experience. It is not uncommon, especially in the summer months when the data collection for this study was conducted, for large numbers of orientees to be those who were recently graduated from college.

The majority of the nurses in the study reported having a bachelor's degree, which is consistent with the hiring preference of the network facilities for nurses using this educational preparation. But there are exceptions; nurses with associate's degrees and diplomas may transfer within the system or be hired with the stipulation that they complete a bachelor's degree in nursing within 5 years. Few of the nurses in the sample held a master's degree in nursing; for the facilities in this network, the majority of hired nurses are needed to fill staff nurse positions rather than advanced practice positions. The orientation program is a bi-monthly program and nurses are hired according to need; therefore, when a new program or practice is established within the system, nurses with similar education or background may be needed. In this study, assignment to the debrief groups was done based on the date of hire. One group had all three diploma nurses and a larger number of associate degree nurses because they were hired at the same time. Traditionally, diploma nurses are not hired for the positions in acute hospital settings but rather are employed in practice or outpatient settings.

Nursing experience ranged from less than one year to over ten years. The RNs in the sample identified many areas of clinical experience, but the majority were previously employed in a hospital setting. Most the participants were newly hired into this health care system, which is consistent with hiring patterns for health care facilities in the summer. A small percentage were

transfers who were required to attend the orientation again because it had been more than two years since they were in their previous position in the healthcare system. Participants reported SBE experience and the majority had SBE in academic or hospital settings; a little more than half rated these experiences as positive. Although this rating is a cause for concern in SBE, the researcher did not collect data regarding the reasons.

The distribution of nurses in this sample clustered into groups of unequal sizes based on gender and ethnicity. The participants were predominantly females and the ethnic group with the most reported responses was White-Non-Hispanic. Other various race/ethnic groups were represented in smaller numbers. According to the Bureau of Labor Statistics (2015), only about 10% of the nursing work force is male, and the distribution of employed nurses by ethnicity is 12% African American, 9 % Asian, and 6.6 % Hispanic/Latino.

Preliminary analyses revealed that the only variable for which there was a statistically significant difference between the groups was educational preparation. There were only three diploma nurses in the sample, all of whom were hired at the same time and hence placed in the same debriefing group. This study used convenience sampling, hence there was no random assignment of participants to different debrief groups. This is one of the limitations of this study. For all the other variables, there were no significant differences between the two debriefing groups.

The researcher performed additional correlations to identify the relationships between instruments' scores and learner's characteristics. Educational degree earned by the participants was the only demographic variables for which there was a statistically significant difference between the two groups.

Five research questions guided the study. To address, the first three questions, the researcher conducted statistical analysis to compare results between the two debriefing groups.

Question 1. Is there a difference in posttest score between participants who experienced different debriefing methods following a simulation experience?

The researcher examined the results between the two groups to determine if there were differences in performance based on group assignment on an examination that followed a case study. The scores of the independent *t*-tests for the case study showed no significant difference between the two groups. There were several possible explanations for these results, which pertain to the test, the SBE experience, and other factors. The researcher developed the case study and exam and used a panel of experts for the validation of the content and question construction. This instrument was not a standardized test validated to measure knowledge acquisition of the SIRS criteria, staging of sepsis, and clinical management, or the methods the nurse should use to communicate the status of a deteriorating septic patient to other members of the health care team. The researcher could not find a standardized test. In addition, ten minutes to complete the exam may have not been a sufficient amount of time for participants to read the case study and answer the ten questions.

The two debriefing groups were unequal in number. Although the DEBRIEF method group had more participants than the 3D-DDD method group, the percentage of participants with passing scores was low for both groups. The majority of participants identified the need to communicate the worsening condition using SBAR; however, for the sample, only 6% identified severe sepsis as the initial clinical problem and only 61% correctly assessed the patient's worsening condition of septic shock. Based on the exam results, the study participants were unfamiliar with the SIRS criteria; only 45% of the sample answered this as the correct clinical

criterion for identifying sepsis. These results show gaps in knowledge of the clinical indicators of sepsis. During this study, content on SIRS criteria and its relationship to sepsis and the staging of sepsis was not provided to the participants prior to the SBE. For those with limited knowledge of this topic prior to the simulation experience and debriefing, the short time spent in the simulation scenario and debrief may have affected the participants' ability to learn this content to the extent needed to score highly on the exam. Instruction in content prior to a SBE can provide the necessary theory for SIRS criteria, staging of sepsis, clinical management, and the best communication methods. This offers the opportunity for learners to acquire knowledge in advance then apply this knowledge to a specific clinical presentation.

Clinical reasoning is a cognitive process and a skill that allows a nurse to use both past experience and previously acquired knowledge to make safe clinical decisions for an individual patient's specific clinical condition (Banning, 2008; Benner, 2004; Jones, 1988; Mok, So, & Chung, 2016). Effective teaching methods enable nurses to assimilate knowledge and skills about patients' clinical conditions. Providing content before the simulated clinical experience exposes the participant to the pathophysiology of sepsis, the clinical indicators, and the corresponding evidenced-based practices in today's healthcare. SBE is experiential learning that permits active experimentation (Kolb & Kolb, 2009) and application of new knowledge in a controlled practice setting.

Novice nurses may use a rote tactic when caring for patients, relying on memorized approaches to nursing care and not comprehending the specificity of the clinical picture. As nurses gain clinical experience and knowledge, they move past rote practice and recognize links between concepts. An experienced nurse develops cognitive processes to make inferences from the clinical data, create alternatives, contemplate these alongside evidence, and develop a plan of

care that promotes best patient outcomes, evaluates patient progress, and reflects on and learns from nursing actions consequently representing clinical reasoning (Tanner, 2006; Tanner et al., 1987; Lampkin et al., 2010; Simmons, 2010). As clinical conditions challenge nurses in applying nursing knowledge, experienced nurses begin to reflect, review, and evaluate current knowledge and its appropriateness to the context of the clinical situation. This is a process of meaningful learning which involves the acknowledgment of links between concepts as opposed to rote memorization. The new concepts are brought forth and assist the individual nurse in adapting to new experiences with assimilation and accommodation. Assimilation occurs when a new concept enters consciousness and is processed and integrated as new knowledge into pre-existent frames or mental models and is then adapted to new experiences (Ausubel, 1968; Dreifuerst, 2010). Accommodation happens when the new knowledge does not fit into the existing frame, and is then modified to promote understanding.

The researcher hypothesized that the personal characteristics of the participants could influence their performance on the exam as well as their responses on the other study instruments; it was for this reason this data were collected. In particular, it was reasonable to speculate that those with prior clinical experience in acute care settings would have been educated in sepsis protocols, as these have been adopted extensively in many of these settings. Prior experience with SBE was also considered as a potential confounding variable. Of all the variables that reflected participants' past experience, hiring status was the only one that demonstrated a statistically significant difference between two categories of participants; those who were transfers within the healthcare system scored significantly higher on the exam than those who were new hires. Since there had been system-wide implementation of the sepsis guidelines prior to the time of this orientation, it is likely that participants who were transfers had

been educated on this topic previously. This finding should be interpreted with caution since the proportion of transfers in this sample was small.

Educational preparation and ethnicity were the two personal variables that showed statistically significant results, but the results for ethnicity could not interpreted due to the low numbers in some ethnic group categories and the potential influence of other variables. This was also the case when examining the exam results by educational preparation. The bachelor's degree category had a large proportion of participants, whereas the diploma category has only three nurses. The performance on the exam by the diploma nurses was lower than nurses with other educational preparation. In addition, two of the diploma nurses reported less than one-year of experience and the third diploma nurse did not enter a response to this question. This lack of experience may have contributed to the low scores. Thus, inferences about the relationship between ethnicity and education preparation and performance on the exam cannot be established.

The largest group of RNs had less than one year of nursing experience; this number represented about one third of the sample. This group of novice nurses may not have acquired the assessment skills to recognize the SIRS and the clinical parameters that indicate sepsis, severe sepsis, and septic shock, the knowledge to clinically manage each stage, or how to best communicate these findings. A newly graduated nurse or novice has no experience in the situations in which they are expected to perform. The novice lacks the confidence to demonstrate safe practice and requires continual verbal and physical cues (Benner, 1982, 1984). The case study may have not provided the cues needed by a novice nurse. According to del Bueno (2005), more than 65% of newly graduated nurses show a deficient level of clinical judgment and reasoning, and thus fail to recognize and respond to a deteriorating patient (Cioffi, Wilkes, Von-Boriceanu, & Scott 2006; Levitt Jones et. al, 2010).

In addition, the type of previous work experience for those participants who declared "other" was unknown; this experience may have been in subacute or community settings. Acute care settings have adopted communication methods and sepsis protocols to guide patient care and improve survival for those patients that present with sepsis. Those who reported their experience as "other" may have worked in specialty areas such as mental health nursing, primary care, and community-based practice settings. Registered nurses with previous nursing experience within these specialty areas may have not used the SIRS criteria, the staging of sepsis, or established communication protocols in daily clinical practice, all of which are evident in today's hospital-based healthcare settings. This possible lack of familiarity with sepsis protocols may have contributed to the low scores for the case study.

The number of learning objectives, volume of attendees, and time constraints may have influenced learning. The four-hour program has over 50 attendees participating in the simulation scenario and debriefing session. Ten minutes were allotted for the scenario and 20 minutes for the debrief session. The interprofessional orientation program's SBE had over ten learning objectives which may have been excessive for the allotted time. Addressing learning objectives is an important step in optimizing learning through simulation; it is crucial that debriefing discussions address the learning objectives (Der Sahakian, Alinier, Salvoldelli, Oriot, Jaffrelot, & Lecomte, 2015; Sawyer et al., 2016).

Although debriefing scripts (Appendix E) were available for the educators, twenty minutes may have not been enough time to reach all the learning objectives, particularly the SIRS criteria, stages of sepsis, its clinical management, and communication. The research published to date recommends that the maximum number of primary learning objectives be limited to five that are based in evidenced-based practices (Waxman, 2010). The literature

supports debriefing sessions that are approximately two to three times the length of the scenario because adequate time is necessary to meet the identified goals and participants' learning needs (Arafeh, 2010; Cantrell, 2008; Childs & Sepples, 2006; Jefferies, 2007). In order for meaningful learning to take place, adequate time is needed for guided discussion and reflection.

One learning objective was recognition of the stage of sepsis using the SIRS criteria. Prior to the study, educators had access to the clinical progression of the simulated scenario. The patient's initial symptoms included three SIRS clinical indicators; the case progressed from sepsis to severe sepsis. The educators received a binder with the case scenario, handoff report, roles, debriefing scripts, and sepsis resources to use as a resource for each debriefing session. Although clinical resources were provided and the case was programmed to represent a progression of sepsis, the educational team may not have clearly understood the progression of sepsis to severe sepsis. Two responses on the faculty survey expressed the case had subtle signs of sepsis making it difficult to assess and to create a sense of urgency.

Eight educators received training for the study, but only six participated and the staffing pattern was not consistent for the simulation learning experience. The schedule did not allow the educator to have repeated exposure to the SBE program's learning objectives, clinical case progression, and debriefing scripts; this may have affected the educators' familiarity and expertise with the case scenario and debriefing method.

Reports of the number of years as a nurse educator ranged from one to over 30 years and reports of the experience of SBE ranged from one to 17 years. The sample of nurse educators had varying years of experience in education and SBE, which could result in different stages of competence and professional growth from novice to expert levels. A novice has limited or no experience in situations characteristic of their domain and is dependent on rules for action,

whereas an expert no longer relies solely on rules and identifies meaningful patterns and characteristics of information based upon their intuitive grasp of the situation, deep knowledge, and experience (Benner, 1982, 1984). Debriefing in SBE is an essential skill that assists the learner in reflecting on mental frames and is critical to learning (Dismukes et al., 2006; Rudolph et al., 2007; Rudolph et al., 2008).

In debriefing, educators and learners review and discuss factual events to make connections between the learner's actions, patient outcomes, and learning objectives. Knowledge and skills of effective debriefing are as important to knowing how to create and implement simulation scenarios (Jefferies, 2005). The varying degrees of competence may have influenced the attainment of the learning objectives for SIRS, sepsis recognition, and communication.

Question 2. Are there differences in the nurse orientees' satisfaction in debriefing and reflection, self-reported clinical reasoning, and clinical learning for nurse orientees' who experience different debrief methods?

The subscales of the Satisfaction with Simulation Experience Scale measured the nurse orientees' satisfaction with debriefing and reflection, self-reported clinical reasoning, and clinical learning. The results indicated there were no statistically significant differences in scores for the entire SSES instrument or for any of the subscales between Group A and Group B. One plausible explanation for this result is that the two debriefing methods may be more similar than different regarding the elements that this instrument measures. While the structures of the 3D-DDD and DEBRIEF methods are different, there are some similarities. The 3D-DDD has three phases and the DEBRIEF method has several components. There are similar phases within each of these debriefing methods: the analysis and summary phases. Analysis is the purposive and reflective discussion: reviewing the factual events that happened. The educator's dialogue facilitates

introspection, revealing the cognitive frames that precipitated clinical actions and decisions. The summary phase formalizes learning by distilling lessons learned and organizing the insights gained during the analysis phase (Sawyer et al., 2016). The attributes of analysis, introspection, and summary found in each debriefing method are similar to the SSES's three subscales of debriefing and reflection, clinical reasoning, and clinical learning. The SSES instrument may have not been able to discriminate the differences between the two types of debriefing methods.

These similarities may have contributed to participants' perceived satisfaction with the debriefing method they experienced. Advocacy and Inquiry is the theoretical underpinning for both the 3D-DDD and the DEBRIEF methods. Reflective, open-ended dialogue exposes internal assumptions and is the method of communication for each debriefing approach. The stance of the educator in both models is a position of genuine curiosity, supporting the participant while addressing performance gaps. The overarching aim in each method is for the educator to provide a safe learning environment where individuals can freely express the cognitive frames that lead to action during a simulated event without negative repercussions. In both approaches, reflective dialogue promotes introspection and a formative assessment.

Actively participating in a simulated scenario induces emotional responses and may produce anxiety. The participant can feel embarrassed or exposed by the simulated event, especially when the stance of the educator is disciplinary instead of assisting the learners to examine the thinking that lead to their actions or behaviors (Dreifuerst, 2009; Edmondson et al., 2016; Rudolph et al., 2013). During the introduction to the interprofessional program nurse educators established a safe learning environment. The educational team expressed their fundamental belief to participants prior to both debriefing methods. This belief is that all learners are intelligent, talented, and caring professionals committed to excellence and self-improvement.

This basic assumption was the debriefing stance for the nurse educators for both methods. Despite some differences between the two debriefing methods, mean satisfaction scores for each of the subscales – debriefing and reflection, clinical learning, and clinical reasoning – were high for both groups; thus, there were no significant differences demonstrated between the two groups.

Question 3. Is there a difference in the perception of psychological safety for nurse orientees' who experience different debrief methods?

The SSES results indicated that participants were satisfied with the simulation learning experience, but it did not specifically address an individual's perception of psychological safety. Psychological safety was defined as an established environment providing boundaries and trust that allow participants to feel accepted and respected. The researcher developed a Visual Analog Scale (VAS) that measured the subjective experience of the participants' perceived psychological safety. The VAS ranged from one (I did not feel safe at all) to ten (I felt extremely safe). The researcher developed this VAS because of its ability to measure levels and ease of use for minimizing survey fatigue. Participants reported the degree of perceived psychological safety experienced during debriefing using the VAS. Although the researcher did not set a benchmark, the majority of the participants indicated a high-level psychological safety with scores of nine or higher reported.

Since this VAS was a new instrument created for the study, the researcher examined the relationship between satisfaction with the simulation experience as reported on the SSES and psychological safety. The assumption was that higher satisfaction scores would be associated with higher levels of perceived psychological safety; it was unlikely that participants would report being satisfied with the SBE if psychological safety was not maintained. The positive and

significant correlations between SSES average scores and VAS scores in both groups demonstrate a consistent response among participants on satisfaction and perceived psychological safety.

The difference in the VAS scores between the groups debriefed by two different methods did not reach the level of statistical significance. The mean level of perceived psychological safety was similar in both groups: a score of nine for the 3D-DDD group and slightly under nine and a half in the DEBRIEF group. This finding may reflect the similarities in both debriefing methods with the shared theoretical underpinning that guides the educators to communicate during debriefing in a way that provides a safe learning environment, as previously described. The high scores indicate that the educators established a safe learning environment for the participants with both methods. In addition, the range in variance between the two groups was not equal; the discrepancy in the group sizes may have contributed to this. The VAS was reported on a scale of one to ten; thus, it is possible that the instrument was not sensitive enough to detect small differences in perceived psychological safety.

There were no statistically significant differences in Group A and Group B. This may be due to the size of the sample. The researcher conducted a priori power analysis to identify the sample size; a moderate effect size was used. Since the difference between the two groups was small, the possibility exists that the sample may have been too small to identify any difference in perceived psychological safety between the two debrief methods. The subset of registered nurses selected to participate in the study may have been too small to represent the overall nursing population. The sample may have been underpowered. A larger sample may have been more representative of the nursing population. The sample was too small to detect a difference between the groups and learner characteristics. A larger sample could express the strength of

relationships between the research variables, but perhaps no differences are present because of the similarities in found both debriefing methods.

Question 4. What influence have certain learner characteristics (i.e. culture, gender, age) on satisfaction in debriefing and reflection, self-reported clinical reasoning, and clinical learning for nurse orientees who experience different debrief methods?

The researcher performed analyses to identify the relationships between the learners' characteristics (age, gender, ethnicity, and educational degree) and satisfaction in debriefing and reflection, self-reported clinical reasoning, and clinical learning. The findings did not identify any meaningful relationships between a learner's characteristics and the subscale scores. The only analysis that yielded statistically significant results was for the debriefing and reflection (DR) subscale and ethnicity. The low number of participants in certain ethnic groups and the lack of homogeneity of variance on the DR limited the ability to interpret this result. The educational degree earned by the participants was the only demographic variable for which there was a statistically significant difference between the two groups.

The researcher explored published literature on the cultural learning preferences of ethnically diverse participants. Culture may influence an individual's perception of the simulation experience. The debriefing phase requires participants to be able to share their experience and to verbalize the cognitive processes that lead to clinical decisions. Educators should comprehend the individual's frame to create a shared mental model. According to Chung, Dieckmann, and Issenberg (2013), frames contain the norms, values, and beliefs that a person holds regarding all aspects of life and work; this frame is contained within a cultural filter. Cultural norms and beliefs influence how an individual perceives and interprets events and interactions. Debriefing is a conversational style teaching method and cultural barriers may exist.

Debriefing may be more difficult for learners who come from cultures where the motivation to defer to authority outweighs the choice to disclose views that contradict the educator (Rudolph et. al, 2006). The sample had various ethnic groups represented, but several of the subgroups were small in size. Some groups only had two people, and hence post hoc analyses could not be performed. A larger sample size may have yielded different results.

Question 5. What differences do faculty members describe between the two different debriefing methods?

The sample of the educators was small: eight were trained for each debriefing method and only six participated in the SBE. The researcher received six surveys and there were inconsistencies in the responses. The five open-ended survey questions collected the educators' opinions on the SBE experience and the 3D-DDD and DEBRIEF methods.

The researcher was able to obtain the educators' perceptions of the differences between the two methods. The reported results describe the positive attributes and challenges of each debriefing method. Humanism was the term used to describe the 3D-DDD approach because it took into account the individual's feelings, especially when identifying performance gaps and helping to promote reflective thinking. The reported challenging aspects for the 3D-DDD model were expressing emotions in front of colleagues and providing the reflective questions to express those feelings related to simulation.

The education team also described the positive attributes of the DEBRIEF model. The report was that this approach was structured and organized, it was easy to use, and the "Benchmarking" and "Review" dialogue focused on clinical and learning objectives aspects rather than using a humanistic style. The most challenging components of the DEBRIEF model were its lack of a humanistic approach, difficulty keeping the discussion focused to meet

the time constraints, and a more limited opportunity for reflection when compared to the 3D-DDD model.

When comparing the educators' responses with those of the participants, a large majority of the registered nurses identified the DEBRIEF approach as establishing a safe learning environment. Although educators reported the lack of a humanistic focus as a shortcoming for the DEBRIEF, participants' high scores on the SSES and VAS show psychological safety was achieved. The results for DEBRIEF method show that participants identified this approach as establishing a safe learning environment. This difference in perception between the educators and the participants is interesting to note. The 3D-DDD was chosen by the educators as the method for debrief in the interprofessional program. The education team may have had comfort and familiarity with the 3D-DDD method because of the similarities between the 3D-DDD model and the AI method.

Educators had been previously trained by the simulation center using the AI model. There are similar elements found between the 3D-DDD method and AI. The three phases for debriefing are comparable. Phases for the AI include reaction, analysis, and summary. The first phase is a release of emotional tension, followed by a facilitated introspection of the clinical events and action by the educator. The final phase formalizes learning by having individuals summarize the items learned and the new knowledge to be integrated into practice. The AI method also requires that the educator provide a safe learning environment by having an open debriefing stance, delivering reflective dialogue to expose mental models, and using learning objectives to guide the conversation.

Implications for Nursing

Advances in high-fidelity technology have made simulation an alternative teaching strategy to contextualize learning for healthcare professionals. The nursing community has integrated simulation as a method of educating nurses. SBE replicates a clinical event allowing the learner to apply the nursing process safely in a controlled environment. In simulation, nurses should understand the context of the patient's clinical picture and its significance to the individual patient. Prudent nursing practice is reliant on the continuum of critical thinking, clinical reasoning, and judgment.

Debriefing is an important element to SBE, particularly when it follows the actual experience. The guided discussion facilitates reflection allowing the learner to examine the elements that directed or influenced their clinical judgment. The primary objective of a debriefing discussion is to maintain the psychological safety of the participants by using good judgment and non-threatening open-ended questions (Rudolph et al., 2006).

The potential consequences of not following best practices can lead to unsuccessful debriefing sessions. Poor practice can have repercussions such as provoking anxiety and impairing learner engagement, attainment of learning objectives, and psychological safety (Der Sahakian et al., 2015; Rudolph et al., 2014). The results of the SSES's subscales and VAS scores for both groups yielded high scores, meaning that participants perceived a level of psychological safety and a safe learning environment. The similarity is scores from these two instruments between the two groups indicates that the educators in this study used best practices for the debriefing sessions regardless of the methodology.

Similar critical attributes were evident for both debriefing methods. The educator maintained a debriefing stance, or basic assumption, that all participants are intelligent people doing their

best. Post simulation, the educator provided guided questioning to allow the participants to reflect upon clinical decisions and performance and to promote a shared mental model. The open-ended questioning focused on individual's cognitive, technical, and behavioral performance in relation to the ascribed objectives. The educators asked participants to formalize learning with a reflection of the lessons learned. Reflection is the conscious consideration of the meaning and implication of an action, which includes the assimilation of knowledge, skills, and attitudes with pre-existing knowledge (Dismukes et al., 2006; Rudolph et al., 2006). The described common characteristics between the two methods are the critical elements outlined in INASCL's (2016) Standards of Best Practices for Debriefing. The researcher explored the relationship between case study exam scores, learner satisfaction, and perceived psychological safety and the results did not yield statistical significance when comparing SSES and VAS scores with the case study scores for both groups. This indicates that even though the participants had to take this examination after the simulation scenario and debriefing, it did not substantially diminish their feelings of satisfaction or psychological safety.

The literature identifies debriefing as a crucial teaching strategy, but there remains minimal research on how to debrief or which methods are effective at achieving learning. There is a concern among educators that the differences in debriefing methods can directly affect an individual's psychological safety and the fulfillment of learning outcomes. The aim of debriefing is to enhance clinical reasoning and to augment the knowledge will be transitioned into practice. Debriefing can establish a level of insightful learning and cultivate a community of healthcare professionals who practice in a culture of safety (Kuiper et al., 2008).

Nursing research has focused on the learner's perception of the simulation learning experience and there is a paucity of research measuring learning outcomes. Measurement of

perceived learning does not equate with measured learning outcomes. The researcher studied clinical reasoning outcomes after each debriefing method using an examination based on a case study. The results indicate that the RNs in the sample were satisfied with clinical learning as demonstrated by the mean SSES subscale score of four; however, the overall mean scores on the case study did not reflect a passing score. The current state of the science calls for research that extends beyond learner's satisfaction and examines skill development, skill transfer, and high order thinking from simulation to actual patient outcomes (Cantrell & Mariani, 2016).

It is also important to propose that nursing research investigate the measurement of the clinical reasoning process. There is a lack of research about the effects of simulation on learning, particularly as it relates to clinical reasoning. Registered nurses with weak clinical reasoning skills often fail to perceive or recognize imminent patient deterioration resulting in adverse patient events. Clinical judgment is reliant on sound reasoning because it is the conclusion of the cognitive process. Although SBE seems to be a valuable component in the development of clinical judgment, research is needed to link performance with skill in real clinical practice settings.

Nurses demonstrate the ability to clinically reason by assessing a patient's problems, and accurately analyzing data to identify the context of the individual patient's clinical condition. Simulation-based education can bridge the gap between knowledge gained in the classroom and clinical practice with patients. Debriefing that follows simulation facilitates the learner's ability to verbalize actions, articulate rationales, identify errors, and improves knowledge and skills.

The researcher compared the effect of two different debriefing methods on nurse orientees' perceptions of psychological safety, satisfaction with development of clinical reasoning skills, and satisfaction with learning using the SSES instrument and VAS scale. The

scores for the 3D-DDD and DEBRIEF methods revealed no statistical difference in the case study exam, SSES, and VAS scores between the two groups. There were positive correlations between the scores on the VAS and the SSES for both groups. The overall mean on the visual analog scale for psychological safety showed a score greater than nine. Future research can expand the VAS and/or the instrument and include Likert scaled items that measure the critical elements of psychological safety. These items could address the stance of the educator, basic assumptions, advocacy for the learner, reflective questioning, the established ground rules, and the clarity of learning objectives. Once internal consistency is established for the VAS and Likert scale instrument, a future study researcher could measure a debriefing method that best supports psychological safety.

Limitations

Several limitations exist within this study. The first limitation was the convenience sample. The interprofessional orientation program has a varying group size between 50 and 90 orientees from various health professions, including registered nurses, nurse practitioners, and physician assistants. The registered nurses in the sample had various educational preparation or degrees, dissimilar years of clinical experience, and different areas of clinical practice. Similarly, the 3D-DDD and DEBRIEF groups were not equal in size.

The second limitation was time. The educational team has only four hours to navigate these large interprofessional orientation groups through a SBE and other multimodal learning activities. The clinical simulation was ten minutes and the debrief time ranged from twenty to thirty minutes. The length of debrief time was dependent on the orientation program's group size. The debrief times could not be extended because the simulation laboratory had programs immediately following the interprofessional orientation program and this space was needed. The

literature supports debriefing sessions that are approximately two to three times the length of this scenario because adequate time is necessary to meet the identified goals and participants' learning needs (Arafeh et al., 2010; Cantrell, 2008; Childs & Sepples, 2006; Jefferies, 2007).

The third limitation was the instrument used to measure clinical reasoning. The researcher developed the case study and the questions to measure clinical reasoning. The participants completed the case study and exams after experiencing a simulated scenario and a debriefing session. A panel of experts evaluated the exam for content clarity prior to first use. Panel members were the content experts and may not be proficient in item writing. The questions may not have measured clinical reasoning.

Another limitation was the ten minutes allotted to participants to read the case study and complete the set of ten multiple-choice questions. This timeframe may have been insufficient, especially for the largest group of RNs that had less than one year of nursing experience. These novice nurses may not have acquired the assessment skills to recognize the SIRS's clinical parameters that signify the stages of sepsis nor the communications skills needed to inform providers.

Multiple learning objectives were an additional limitation to the study. The learning objectives for the scenario were teamwork, team communication, recognition of sepsis and its stage, and interventions. Other learning objectives were hand hygiene, scene safety, introduction of the nurse and healthcare team, patient identification, communication with the family, and incorporating the family member into the plan of care. Seventeen primary objectives were associated with this experiential learning experience.

Training in a simulated learning environment is different from using traditional methods, and the clarity of the learning objectives is essential because these objectives drive the entire

scenario and the debriefing session. The learning objectives can be structured as primary, secondary, and critical elements. According to Waxman (2010), the suggested number of primary objectives is a maximum of five and these are to be broad based objectives supported by evidence-based practices, accrediting bodies, and core competencies. For secondary objectives, the recommended number is a maximum of ten; these include technical (psychomotor) and non-technical (communication) skills. Lastly, critical elements are crucial actions or behaviors to be that the learner should possess prior to a simulation learning experience. The critical elements are key points of patient safety that can be identified on checklist as met or unmet.

In this study, the faculty was a team of master's prepared nurse educators and each had successfully completed the simulation center's simulation instructor program. This mandatory class is based in the Advocacy and Inquiry (AI) model. Although AI is the theoretical framework found within both the 3D-DDD and DEBRIEF methods, none of the nurse educators were trained in the 3D-DDD or DEBRIEF methodologies. The researcher developed the educational program for the faculty for both debriefing approaches.

The team of nurse educators was less than ten. The educators' schedule had limited resources and availability, therefore only two hours for training was available for each debriefing method. Prior to the training session, the team of educators were given a reading assignment for sepsis and the 3D-DDD and DEBRIEF methodologies. The educators received class instruction outlining the components for the 3D-DDD and DEBRIEF methods. They also received an overview for the SIRS criteria and the stages of sepsis. Educators viewed a training video that demonstrated each method of debriefing and were required to provide a return demonstration of both methods of debriefing. Faculty viewed a video of a simulated clinical event where the participants' practice was incorrect and then demonstrated how they would use the 3D-DDD and

DEBRIEF methods. The faculty received printed guidelines for each debriefing method. The researcher had no control as to consistency in the scheduling of the educators performing the two debriefing methods.

Because the educational team had attended the simulation center's debriefing course, they were familiar with the AI approach. For the specific debrief methods, the training sessions were only two hours in length and opportunities for practice with each were limited. Whether the educators conducted each debrief session in accordance with the particular method for that time period is not known, hence the fidelity of treatment cannot be guaranteed. This is an identified limitation of this study. In addition, two educators identified themselves as advanced beginners for the 3D-DDD and DEBRIEF methods, so confidence in their abilities to perform appropriately may have impacted the debriefing session. Additional training sessions would allow for more practice and feedback for each method, particularly for the two nurse educators with one year's experience with SBE.

The use of debriefing scripts developed for the 3D-DDD and DEBRIEF methods is another limitation to the study. The objective of the debriefing scripts was to guide and help facilitate the debriefing sessions for each specific method. The faculty survey did not ask the educators about the usefulness of the debriefing scripts. The faculty received the debriefing script prior to the implementation of the study, yet the faculty independently verbalized difficulty using a debriefing script because it was not similar to their individual way of communicating.

Another limitation was the method used to survey faculty; the faculty responded to five open-ended questions that did not elicit all the information the researcher expected to obtain. It may be preferable in future studies to include Likert scaled items followed by similar open-ended questions.

Recommendations for Further Research

The goal of this study was to compare how two different debriefing methods affect nurse orientees' development of clinical reasoning skills, satisfaction with debriefing and reflection, satisfaction with learning, and perception of psychological. Several recommendations for future work can be derived from this research. The first is in its design. The researcher used an interprofessional orientation program that contained a diverse group of registered nurses. The study recruited RNs entering a health care system or transferring to a new role after two years of employment. The group was not similar in age, gender, race/ethnicity, and educational degree. Future research could benefit from a sample of RNs with similar educational degrees, level of clinical experience, and area of nursing practice. Having a homogenous group could limit confounding variables but could also affect generalizability of the results. A research design with a larger sample could allow the researcher to observe the influence of certain learner characteristics, such as culture, past work, and SBE experience, on satisfaction in debriefing and reflection, self-reported clinical reasoning, and clinical learning for learner's who experience different debrief methods. A study design using similar groups of learners over a longer period would add to the gathered information. Research samples could be derived from academic or healthcare settings.

The researcher measured the learners' satisfaction with the simulation learning experience using the SSES tool. This instrument measures perceived satisfaction with debriefing and reflection, clinical reasoning, and clinical learning. The researcher aimed at measuring applied clinical reasoning skills with a case study and exam. To prevent previous exposure or a familiarity with published questions, the researcher avoided using a standardized exam. In future

studies, a researcher can obtain permission to use a standardized test for construct validity of the question or pilot an exam to obtain reliability and validity.

Another recommendation for future research is to consider the number of learning objectives because there must be enough time in the simulated scenario and debriefing to address all learning objectives. Learning objectives are elements that direct the clinical event, desired learner responses, and learning outcomes. Organizing and limiting learning objectives to primary, secondary, and critical elements enables the achievement of learning outcomes while meeting the time constraints. The researcher compared two different debriefing approaches and the educators received a two-hour training session. A recommendation is to consider is the amount of time dedicated to the training of educators in simulation-based education. Many accredited simulation centers offer faculty development programs for SBE. The content of these training programs includes learning theories, scenario development, writing learning objectives, scenario programming, debriefing methodology, and practice. These accredited simulation centers' training programs can serve as models for future studies when educating faculty for SBE.

Conclusions

Complex medical therapies and high patient acuity levels are evident in the fast-paced environment of healthcare. Best patient outcomes require that nurses have a firm knowledge base and are clinically competent at providing quality care. Safe patient care is dependent on the nurses' acquisition and application of clinical reasoning. Nurses process patients' clinical problems in a continuum of critical thinking, clinical reasoning, and clinical judgment. Nurses formulate a plan to address the clinical problems specific to an individual patient. Academic nursing programs prepare new graduate nurses for entry into practice; however nursing educators

need to evaluate and further cultivate the clinical decision making skills of newly employed nurses and refine the skills of experienced nurses. Orientation programs' objectives are to ensure the provision of safe and high quality patient care.

Simulation-based education has been widely adopted in healthcare as an instructional methodology. This experiential teaching method immerses learners into a replicated clinical event. A simulation learning experience permits the learners to apply nursing process, knowledge, skill, and decision making in a controlled environment. Nurses exhibit the ability to clinically reason by assessing the clinical problem, accurately analyze the data, and safely identify the clinical problem within the context of the specific individual patient. Debriefing following simulation is a guided discussion that facilitates reflection on action. This supportive dialogue exposes a participant's cognitive frames and performance gaps.

The objective of debriefing is to increase the participants' awareness of their actions and behaviors and the clinical judgments/decisions these actions were based upon. Educators play a crucial role in this process by asking open-ended questions to guide the students through self-reflection in a safe environment. The inquiry is a formative assessment and should uphold the psychological safety of the learners. The reflective dialogue exposes the challenges of simulation and connects concepts to learned theory. The literature supports debriefing as the area where learning takes place, but studies that measure attainment of learning outcomes are scarce in nursing research.

The researcher compared how two different debriefing methods affected the nurse orientees' perception of psychological safety, satisfaction with development of clinical reasoning skills, and satisfaction with learning**.** A case study followed by an exam measured clinical reasoning skills.

This study contributes to previous research in the area of simulation-based education. Primarily, the researcher compared two different debriefing methods when used with a sample of nurse orientees. Although there were limitations to the study, the provided evidence supports that best practices to promote a safe learning environment and learner satisfaction were incorporated in both of the debriefing methods investigated. The SSES instrument used in previous research with undergraduate nursing students demonstrated reliability when used with this sample, which extends the use of this instrument to registered nurses in simulation studies. In addition, the researcher created a VAS instrument to measure psychological safety that was introduced and tested in this study. This measurement method can be used and further developed in future research. This study expands the research on the critical elements needed for psychological safety, meaningful learning, and measurement of learning outcomes.

REFERENCES

Ahmed, M., Sevdalis, N., Guruaja, P., & Nestel, D. (2012). Identifying best practice guidelines in debriefing in surgery: a tri-continental study. *American Journal of Surgery*, *203*, 523-529.

Aiken, L. H., Clarke, S. P., Chueng, R. B., Sloane, D. M., & Silber, J. H. (2003). Educational levels of hospital nurses and surgical patient mortality. *JAMA*, *290*(12), 1617-1620.

Alfaro-LeFevre, R. (2013). *Critical Thinking, clinical reasoning, and clinical judgment: A practical approach* (5th ed.). St Louis, MO: Elsevier.

American Association of Colleges of Nursing (AACN). (1998). The essentials of baccalaureate education for professional nursing practice. Retrieved from http://www.aacn.nche.edu/search-results?cx=004745212939755731071%3A9ffni8oukg8&cof=FORID%3A11&ie=UTF-8&q=American+Association+of+Colleges+of+Nursing.+The+essentials+of+baccalaureate+education+for+professional+nursing+practice.+Washington%2C+&sa.x=9&sa.y=4&sa=Search&siteurl=www.aacn.nche.edu%2Fpublications%2Fposition%2Fbacc-degree-prep&ref=www.google.com%2F&ss=0j0j1

American Philosophical Association (APA). (1990). *Critical thinking: a statement of expert consensus for purposes of educational assessment and instruction* [ERIC document], ED 315-423.

American Psychological Association. (2010). http://www.apa.org

Amland, R. C., & Hahn-Cover, K. C. (2014, November 10). Clinical decision support for early recognition of sepsis. *American Journal of Medical Quality,* 1-8. http://dx.doi.org/10.1177/1062860614557636

Arafeh J. M., Snyder Hansen S., Nichols A. (2010) Debriefing in simulated-based learning, facilitating a reflective discussion. *Journal of Perinatal Neonatal Nursing*, *24*, 302-309.

Ausubel, D. P. (1962). A subsumption theory of meaningful verbal learning and retention. *Journal of General Psychology*, *66*, 213-224.

Ausubel, D. P. (1968). *Educational psychology: a cognitive view*. New York: Holt, Rinehart and Winston.

Banning, M. (2008). Clinical reasoning and its application to nursing: Concepts and research studies. *Nurse Education in Practice*, *8* (3), 177-183.

Bartone, P. T., & Adler, A. B. (1995). *Event-oriented debriefing following military operations: What every leader should know* (White Paper WRAIR/TR-95-0017). Retrieved from http://studmed.ru/bartone-paul-t-adler-amy-b-event-oriented-debriefing-following-military-operations-what-every-leader-should-know_bfc37b2cf7b.html

Bastable, S. B. (2008). *Nurse as educator: Principles of teaching and learning for nursing practice* (3rd ed.). Sudbury, MA: Jones and Bartlett.

Benner, P. (1982). From novice to expert. *American Journal of Nursing*, *82*(3), 402-407.

Benner, P. (1984). *From novice to expert: Power and excellence in nursing practice*. Menlo Park, CA: Addison-Wesley.

Benner, P. (2004). Using the Dreyfus Model of skill acquisition to describe and interpret skills acquisition and clinical judgment in nursing practice and education. *Bulletin of Science, 24*, 188-199.

Benner, P., Sutphen, M., Leonard, V., & Day, L. (2010). *Educating nurses A call for radical transformation*. San Francisco, CA: Jossey-Bass.

Benner, P., & Tanner, C. (1996). *Expertise in nursing practice, caring, clinical judgment and ethics*. New York: Springer.

Billings, D. M., & Halstead, J. A. (2009). *Teaching in Nursing: A guide for Faculty* (3rd ed.). St. Louis, MI: Saunders.

Bone, R. C., Balk, R. A., Cerra, F. B., Dellinger, R. P., Fein, A. M., & Knaus, W. A. (1992). Definitions for sepsis and organ failure and guidelines for the use of innovative therapies in sepsis. The ACCP/SCCM Consensus Conference Committee. American College of Chest Physicians/Society of Critical Care Medicine. [Entire issue]. *Chest Journal*, *101*(6). http://dx.doi.org/10.1378/chest.101.6.1644

Brackenreng, J. (200*4*). Issues in reflection and debriefing: How nurse educators structure experiential activities. *Nurse Education in Practice*, 4(4), 264-270.

Bureau of Labor Statistics. (2015). https://www.bls.gov/ooh/healthcare/registered-nurses.htm

Cantrell, M. A. (2008). The importance of debriefing in clinical simulations. *Clinical Simulation in Nursing*, *4*(3), e19-e23.

Cantrell, M. A., & Mariani, B. (2016). Moving the agenda forward in simulation-based research. *Clinical Simulation in Nursing*, *12*(11), i-ii.

Center for Disease Control and Prevention (CDC). (June 22, 2011). http://www.cdc.gov/nchs/data/databriefs/db62.htm

Cheng, A., Eppich, W., Grant, V., Sherbino, J., Zendejas, B., & Cook, D. A. (2014). Debriefing for technology-enhanced simulation: a systematic review and meat-analysis. *Medical Education*, *48*, 657-666.

Childs, J. C., & Sepples, S. (2006). Clinical teaching by simulation: Lessons learned from a complex patient care scenario. *Nursing Education Perspectives*, *27*(3), 154-158.

Chung, H. S., Dieckmann, P., & Issenberg, S. B. (2013). Is it time to consider cultural differences in debriefing. *Simulation in Healthcare*, *8*(3), 166-170.

Cioffi, J., Wilkes, C., Von-Boriceanu, O., & Scott, J. (2006). Clinicians' response to abnormal vital signs in an emergency department. *Australian Critical Care, 19*(2), 66-72.

Davies, S., & Gidman, J. (2011). Interprofessional education within a university NMP programme. *Nurse Prescribing*, *9*(6), 299-302.

Decker, S., Fey, M., Sideras, S., Caballero, S., Rockstraw, L. R., Boese, T., ... Borum, J. C. (2013). Standards of Best Practice: Simulation Standard VI: The Debriefing Process. Clinical Simulation in Nursing, *9*(6 SUPPL). DOI: 10.1016/j.ecns.2013.04.008

Del Bueno, D. (2005). A crisis in critical thinking. *Nursing Education Perspectives*, *26*(5), 278-282.

Dellinger, R. P., Levy, M. M., Rhodes, A., Annane, D., Gerlach, H., Opal, S. M., ... Jaeschke, R. (2012). Surviving Sepsis Campaign: international guidelines for management of severe sepsis and septic shock. *Intensive Care Medicine*, *39*(2), 165-225. http://dx.doi.org/10.1007/s00134-012-2769-8

Der Sahakian, G., Alinier, G., Salvoldelli, G., Oriot, D., Jaffrelot, M., & Lecomte, F. (2015). Setting conditions for productive debriefing. *Simulation and Gaming*, *46*(2), 197-208.

Dieckmann, P., Friis, S. M., Lippert, A., & Ostergaard, D. (2009). The art and science of debriefing in simulation as social practice: Ideal and practice. *Medical teacher*, *31*, e287-e294.

Dismukes, R. K., Gaba, D. M., & Howard, S. K. (2006). So many roads: Facilitated Debriefing in healthcare. *Simulation in Healthcare, 1*(1), 23-25.

Dismukes, R. K., & Smith, G. M. (Eds.). (2000). Facilitation and debriefing in aviation training and operations. Aldershot, England: Ashgate Publishing Ltd.

Dreifuerst, K. T. (2009). The essentials of debriefing in simulation learning: A concept analysis. *Nursing Education Perspectives, 30,* 109-114.

Dreifuerst, K. T. (2010). *Debriefing for meaningful learning: Fostering development of clinical reasoning through simulation* (Doctoral dissertation, Indiana University). Retrieved from http://hdl.handle.net/1805/2459

Edmondson, A. (1999). Psychological safety and learning behavior in work teams. *Administrative Science Quarterly, 44,* 350-383.

Edmondson, A. C., Higgins, M., Singer, S., & Weiner, J. (2016). Understanding psychological safety in health care and education organizations: A comparative perspective. *Research in Human Development, 13*(1), 65-83.

Fanning, R. M., & Gaba, D. M. (2007). The role of debriefing in simulation-based learning. Simulation *in Healthcare*, 2(2), 115-125.

Fey, M. K., Scrandis, D., Daniels, A., & Haut, C. (2014). Learning through debriefing: Student's perspectives. *Clinical Simulations in Nursing, 10,* e249-e256.

Forchuk, C. (1991). Peplau's theory: Concepts and their relations. *Nursing Science, 4*(2), 52-60. http://dx.doi.org/10.1177/089431849100400205

Gaba, D. M. (2004). The future vision of simulation in health care. *Quality and Safety in Health Care, 13*(1), i2-i10.

Groom, J. A., Henderson, D., & Sittner, B. J. (2013). National league for nursing-Jefferies simulation framework project: Simulation design characteristics. *Clinical Simulation in Nursing, X*(e1-e8). http://dx.doi.org/10.1016/j.ecns.2013.02.004

Gururaja, R. P., Yang, T., Yang, J. T., & Chauvin, S. W. (2012). Examining the effectiveness of debriefing at the point of care in simulation-based operating room team training. In: Henriksen K., Battles J. B., Keyes M. A., et al., editors. *Advances in Patient Safety: New Directions and Alternative Approaches (Vol. 3: Performance and Tools).* Rockville, MD: Agency for Healthcare Research and Quality.

Hallmark, B. F. (2010). The effect of faculty debriefing training on the achievement and satisfaction of pre-licensure nursing students. *Clinical Simulation in Nursing, 6*(3), e115.

Hanna, D. R., & Romana, M. (2007). Debriefing after crisis. *Nursing Management, 38*(8), 38-42, 44-5, 47.

INASCL Standards of Best Practice: Simulation. (2013). Retrieved from http://www.inacsl.org/

Institute of Medicine. (2004). *Keeping patients safe: Transforming the work environment of nurses*. Retrieved from http://www.nap.edu/booksearch.php?booksearch=1&record_id=10851&term=simulation&chapter=162-225

Ironside, P. M. (2003). New pedagogies for teaching thinking: The lived experiences of students and teachers enacting narrative pedagogy. *Journal of Nursing Education, 42*(11), 509-516.

Issenberg, S. B., McGaghie, W. C., Petrusa, E. R., Gordon, D. L., & Scalese, R. J. (2005). Features and uses of high-fidelity medical simulation that lead to effective learning: BEME systematic review. *Medical Teacher, 27*(1), 10-28.

Jasper, M. (2003). *Beginning reflective practice: Foundations in nursing and health care.* Cheltenham, United Kingdom: Nelson Thornes.

Jefferies, P. R. (2005). A framework for designing, implementing, evaluating simulations used as teaching strategies in Nursing. *Nursing Education Perspectives, 26 (2),* 96-103.

Jefferies, P. R. (2007). Integrating guided reflection into simulated learning experiences. In P. R. Jefferies (Ed.), *Simulation in nursing education from conceptualization to evaluation* (pp. 73-85). New York, NY: National League for Nursing.

Jones, J. (1988). Clinical reasoning in nursing. *Journal of Advanced Nursing*, *13*(2), 185-192.

Kaddoura, M. A. (2010). New graduate nurses' perceptions of the effects of clinical simulation on their critical thinking, learning and confidence. *Journal of Continuing Education in Nursing*, *41(11*), 506-516.

Kneebone, R. L., Scott, W., Darzi, A., & Horrocks, M. (2004). Simulation and clinical practice: Strengthening the relationship. *Medical Education*, *38*, 1095-1102.

Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Englewood Cliffs, NJ: Prentice-Hall.

Kolb, A., & Kolb, D. (2009). Experiential learning theory: A dynamic approach to management, learning, education, and development. In S. J. Armstrong & C. V. Fukami (Eds.), *The SAGE handbook of management learning, education, and development* (pp. 42-67).

Kolb, D. (1976). *Learning style inventory: Technical manual*. Boston, MA: McBer and Company.

Kolb's cycle of experiential learning. (2010). Retrieved from http://academic.regis.edu/ed202/subsequent/kolb2.htm

Kraischsk, M., & Anthony, M. (2001). Benefits and outcomes of staff nurses' participation in decision-making. *The Journal of Nursing Administration, 31*(1), 16-23.

Krautz, D. D., Kuiper, R., Pesut, D. J., Knight-Brown, P., & Daneker, D. (2005). Promoting clinical reasoning in undergraduate nursing students: Application and evaluation of the Outcome Present State Test (OPT) model of clinical reasoning. *International Journal of Nursing Education Scholarship, 25*(1), Article1.

Kuiper, R., Heinrich, C., Matthias, A., Graham, M. J., & Bell-Kotwall, L. (2008). Debriefing with the OPT model of clinical reasoning during high fidelity patient simulation. *International Journal of Nursing Education Scholarship*, 1-13.

Lampkin, S., Levett-Jones, T., Bellchambers, H., & Fernandez, R. (2010). Effectiveness of patient simulation manikins in teaching clinical reasoning skills to undergraduate students: A systematic review. *Clinical Simulation in Nursing, 6*, e207-e222.

Lasater, K. (2007a). High-fidelity and the development of clinical judgment: Students' experience. *Journal of Nursing Education, 46*(6), 269-276, 469-476.

Lasater, K. (2007b). Clinical Judgment development: Using simulation to create an assessment rubric. *Journal of Nursing Education, 46*(11), 496-503.

Lauri, S., Salantera, S., Chalmers, K., Elkman, S., Kim, H., Hesook, S., ... MacLeod, M. (2001). An exploratory study of clinical decision-making in five countries. *Image–Journal of Nursing Scholarship, 33*(1), 83-90.

Levett-Jones, T., Hoffman, K., Dempsey, Y., Joeng, S., Noble, D., & Norton, C. (2010). The 'five rights' of clinical reasoning: An educational model to enhance nursing students' ability to identify and manage clinically 'at risk' patients. *Nurse Education Today, 30*(6), 515-520.

Levett-Jones, T., & Lampkin, S. (2013). A systematic review of the effectiveness of simulation debriefing in health professional education. *Nurse Education Today,* 1-6. http://dx.doi.org/10.1016/j.nedt.2013.09020

Levett-Jones, T., McCoy, M., Lampkin, S., Hoffman, K., Dempsey, J., Arthur, C., & Roche, J. (2011). The development and psychometric testing of the satisfaction with simulation experience scale. *Nurse Education Today, 31*(), 705-710.

Lisko, S. A., & O'Dell, V. (2010, March/April). Integration of theory and practice: Experiential learning and nursing Education. *Nursing Education Perspectives, 31*(2), 106-108.

Lusk, J. M., & Fater, K. (2013). Postsimulation debriefing to maximize clinical judgment development. *Nurse Educator, 38*(1), 16-19.

Magnolis, C., Burns, D. J., Assudani, R., & Chinta, R. (2013). Assessing experiential learning styles: A methodological reconstruction and validation of the Kolb learning style inventory. *Learning and Individual Differences*, *23*, 44-52.

McCausland, L. L., Curran, C. C., & Cataldi, P. (2004). Use of human simulators for undergraduate nurse education. *International Journal of Nursing Education Scholarship, 1*(1), 1-17.

McGaghie, W. C., Issenberg, S. B., Petrus, E. R., & Scalese, R. J. (2010). A critical review of simulation-based medical education research. *Medical Education*, *44*, 50-63.

Meakim, C., Boese, T., Decker, S., Franklin, A. E., Lioce, L., Sando, C. R., & Borum, J. C. (2013). Standards of best practice: Simulation standard I: Terminology. *Clinical Simulation in Nursing*, *9*, S3-S11.

Mitchell, P. H. (2008). Patient Safety and Quality: An Evidence-Based Handbook for Nurses. In R. G. Hughes (Ed.), *Patient Safety and Quality: An Evidence-Based Handbook for Nurses*. Retrieved from http://www.ncbi.nlm.nih.gov/books/NBK2651/

Mok, T. H., So, C. F., & Chung, J. W. (2016). Effectiveness of high-fidelity patient simulation in teaching clinical reasoning skills. *Clinical Simulation in Nursing*, *12*(10), 453-467.

Morath, J. (2015). CMS Announces Data Collection for Sepsis Bundle Measure. Retrieved from http://www.calhospital.org/cha-news-article/cms-announces-data-collection-sepsis-bundle-measure

Murphy, J. I. (2004). Using focused reflection and articulation to promote clinical reasoning: An evidence-based teaching strategy. *Nursing Education Perspectives*, *25*(5), 226-231.

National League for Nursing Accreditation Commission. (2002). *Accreditation manual*.

Neill, M. A., & Wotton, K. (2011). High-fidelity simulation debriefing in nursing education: A literature review. *Clinical Simulation in Nursing*, *7*(5), e161-e168.

Papathanasiou, I. V., Kleisiaris, C. F., Fradeloa, E. C., Kakaou, K., & Kourkouta, L. (2014). The esssential skill for nursing students. *Acta Informatica Medica*, *22*(4), 283-286. http://dx.doi.org/10.5455/aim.201422.283-286

Peden-McAlpine, C., & Clark, N. (2002). Early recognition of client status changes: The importance of time. *Dimensions of Critical Care in Nursing*, *21*, 144-151.

Polit, D., & Beck, C. T. (2012). Planning a nursing study. In *Nursing Research* (9th ed., pp. 174-200). Philadelphia, PA: Wolters Kluwer Health Lippincott Williams & Wilkins.

Poore, J. A., Cullen, D. L., & Schaar, G. L. (2014). Simulation-based interprofessional education guided by Kolb's experiential learning theory. *Clinical Simulation in Nursing*, *10*(5), e241-e247. http://dx.doi.org/http://dx.doi.org/10.1016/j.ecns.2014.01.004

Raemer, D., Anderson, M., Cheng, A., Fanning, R., Nadkarni, V., & Savoldelli, G. (2011). Research regarding debriefing as part of the learning process. *Simulation in Healthcare*, *6*(Suppl), S52-S57.

Rudolph, J., Simon, R., Raemer, D., & Eppich, W. (2008). Debriefing as a formative assessment: Closing performance gaps in medical education. *Academic Emergency Medicine*, *15*(11), 101-1016.

Rudolph, J. W., Foldy, E. G., Robinson, T., Kendall, S., Taylor, S. S., & Simon, R. (2013). Helping without harming: The instructor's dilemma in debriefing-A case study. *Simulation in Healthcare*, *8*(5), 304-316.

Rudolph, J. W., Raemer, D. B., & Simon, R. (2014). Establishing a safe container for learning in simulation: the role of presimulation briefing. *Simulation in Healthcare*, *9*(6), 339-349.

Rudolph, J. W., Simon, R., Dufresne, R. L., & Raemer, D. B. (2006). There's no such thing as "nonjudgmental" debriefing: A theory and method for debriefing with good judgment. *Simulation in Healthcare*, *1*(1), 49-55.

Rudolph, J. W., Simon, R., Rivard, P., Dufresne, R. L., & Raemer, D. B. (2007). Debriefing with good judgment: Combining rigorous feedback with genuine inquiry. *Anesthesiology Clinics*, *25*(2), 361-376.

Sawyer, T., Eppich, W., Brett-Fleeger, M., Grant, V., & Cheng, A. (2016). More than one way to debrief: A critical review of healthcare simulation and debriefing methods. *Simulation in Healthcare*, *11*(3), 209-217.

Sawyer, T. L., & Deering, S. (2013). Adaptation of the US army's after-action review for simulation debriefing in healthcare. *Simulation in Healthcare*, *8*(6), 388-396.

Scheffer, B., & Rubenfeld, M. (2000). A consensus statement on critical thinking in nursing. *Journal of Nursing Education, 39,* 352-359.

Schön, D. (1983). *The reflective practitioner: How professionals think in action* (ed.). New York, NY: Basic Books.

Schön, D. (1987). *Educating the reflective practitioner: Toward a new design for teaching and learning in the professions*. San Francisco, CA: Jossey-Bass.

Shinnick, M. A., Woo, M., Horwich, T., & Steadman, R. (2010). Debriefing: The most important component in simulation. *Clinical Simulation in Nursing, 7*, e105-e111.

Simmons, B. (2010). Clinical reasoning: Concept analysis. *Journal of Advanced Nursing*, *66*(5), 1151-1158.

Simmons, B., Lanuza, D., Fonteyn, M., Hicks, F., Maker, K., & Holm, K. (2003). Clinical reasoning in experienced nurses. *West Journal Nurse Research, 25*(6), 702-719.

Surviving Sepsis Campaign. (2014). *Surviving Sepsis Campaign Bundles* [Clinical bundle guidelines]. Retrieved from Surviving Sepsis Campaign: http://www.survivingsepsis.org/Bundles/Pages/default.aspx (Table of Contents). http://www.survivingsepsis.org/Guidelines/Pages/default.aspx

Tanner, C. A. (2006). Thinking like a nurse: A research-based model of clinical judgment in nursing. *Journal of Nursing Education, 45 (6*), 205-212.

Tanner, C. A., Padrick, K. P., Westfall, U. E., & Putzier, D. J. (1987). Diagnostic reasoning strategies of nurses and nursing students. *Nursing Research*, *36*(6), 358-365.

Thompson, C., & Dowding, D. (2002). *In clinical, decision making and judgment in nursing.* Sydney, Australia: Churchill Livingstone.

Tucker, C. A., & Bradshaw, M. J. (2013). Clinical reasoning action-focused thinking. In A. Harvey (Ed.), *Innovative teaching strategies in nursing and related health professions* (6th ed. (pp. 65-77). Burlington, MA: Jones & Barlett.

Van Heukelom, J. N., Begaz, T., & Treat, R. (2010). Comparison of post simulation debriefing versus in-simulation debriefing in medical simulation. *Simulation in Healthcare,*5(*2), 91-97*.

Wang, E. (2011). Facilitative Debriefing Techniques for Simulation-based Learning. *Society for Academic Emergency Medicine*, e5.

Wang, E. (2011). Simulation and adult learning. *Disease-A-Month, 57*(11), 664-678.

Warwick, D., Hunsaker, P. L., Cook, C. W., & Waltman, S. (1979). Debriefing experiential learning exercises. *Journal of Experiential Learning and Simulation*, 1, 91-100.

Waxman, K. T. (2010). The development of evidenced-based clinical simulation scenarios: Guidelines for nurse educators. *Journal of Nursing Education, 49* (1), 29-33.

Wickers, M. P. (2010). Establishing the climate for successful debriefing. *Clinical Simulation in Nursing*, *6*(3), e 83- e 86.

Williams, M. (2007). Building genuine trust through interpersonal emotion management: A threat regulation model of trust and collaboration. *Academy Management Review, 32*(2), 595-621.

Wotton, K., Davis, J., Button, D., & Kelton, M. (2010). Third-year under graduate nursing students' perceptions of high-fidelity simulation. *Journal of Nursing Education, 49*(11), 632-639.

Zhao, N. (2011). Learning from errors: The role of context, emotion, and personality. *Journal of Organizational Behavior, 32*(3), 435-463.

Zigmont, J. J., Kappus, L. J., & Sudikoff, S. N. (2011a). The 3D model of Debriefing: Defusing, discovering, and deepening. *Seminars in Perinatology, 35*(2), 52-58.

Zigmont, J. J., Kappus, L. J., & Sudikoff, S. N. (2011b). Theoretical foundations of learning through simulation. *Seminars in Perinatology, 35*, 47-51.

APPENDICES

Appendix A: Demographic Survey

Directions: Please click to select the best answer. Please round to whole numbers.

1. What is your age in years? Please write number of years_____.
2. What is your gender?
    a. Male
    b. Female
3. What is your highest degree earned in *nursing*?
    a. Diploma
    b. Associate
    c. Bachelor
    d. Masters
    e. Doctorate
4. Please indicate experience as registered nurse in years.
    a. Number of years_____
    b. If less than one year check this box ☐
    c. Please indicate area of most clinical practice (i.e. - medical surgical. ICU, ED)

    _____
5. Please circle one selection to indicate your hiring status
    a. New Hire
    b. Transferring from within the health system

6. Please circle one selection to indicate your experience with simulation-based education
    a. Academic education setting
    b. Employment education setting
    c. Both settings
    d. Do not have any experience with simulation-based education
7. ***ONLY ANSWER IF YOU HAD PRIOR SIMULATION-BASED EDUCATION***-

    Please circle on to rate your previous experience in simulation education. The previous simulation provided a:
    a. positive experience
    b. negative experience
    c. neutral experience
8. Please circle to indicate race/ethnicity
    a. American Indian or Alaska Native
    b. Asian
    c. Black or African American
    d. Native Hawaiian or Other Pacific Islander
    e. Hispanic or Latino
    f. Not Hispanic or Latino
    g. White
    h. Race/ethnicity unknown
    i. Multi-racial

Appendix B Simulation Experience Scale (SSES)

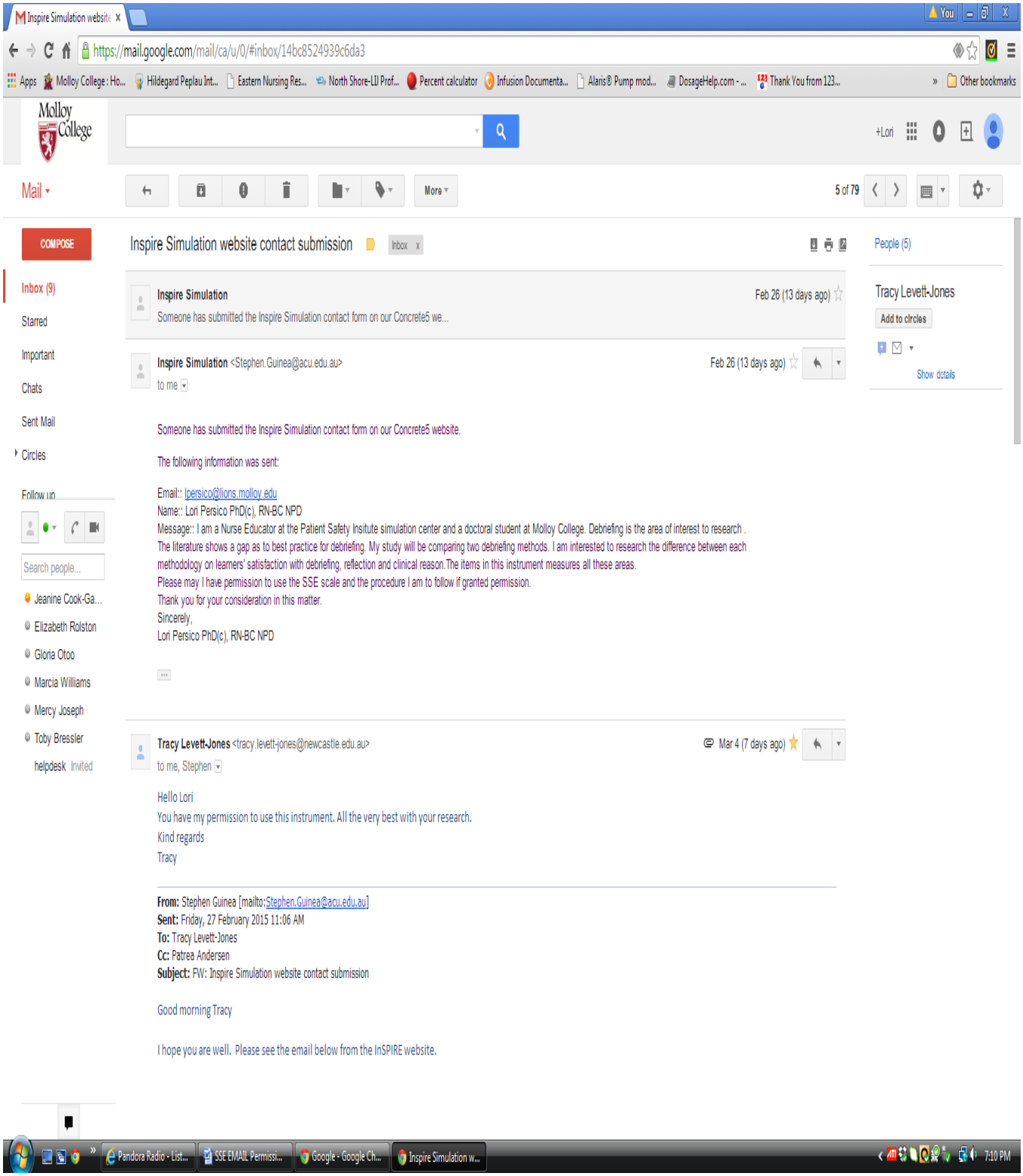
SATISFACTION WITH SIMULATION EXPERIENCE SCALE (SSES)

Below you will find a list of statements. Read each statement and then select the response that best indicates your level of agreement.

- **Please answer every item**, even if one seems similar to another one
- **Answer each item quickly**, without spending too much time on any one item.

Debrief and reflection						
01	The facilitator provided constructive criticism during the debriefing	Strongly disagree	Disagree	Unsure	Agree	Strongly agree
02	The facilitator summarised important issues during the debriefing	Strongly disagree	Disagree	Unsure	Agree	Strongly agree
03	I had the opportunity to reflect on and discuss my performance during the debriefing	Strongly disagree	Disagree	Unsure	Agree	Strongly agree
04	The debriefing provided an opportunity to ask questions	Strongly disagree	Disagree	Unsure	Agree	Strongly agree
05	The facilitator provided feedback that helped me to develop my clinical reasoning skills	Strongly disagree	Disagree	Unsure	Agree	Strongly agree
06	Reflecting on and discussing the simulation enhanced my learning	Strongly disagree	Disagree	Unsure	Agree	Strongly agree
07	The facilitator's questions helped me to learn	Strongly disagree	Disagree	Unsure	Agree	Strongly agree
08	I received feedback during the debriefing that helped me to learn	Strongly disagree	Disagree	Unsure	Agree	Strongly agree
09	The facilitator made me feel comfortable and at ease during the debriefing	Strongly disagree	Disagree	Unsure	Agree	Strongly agree
Clinical reasoning						
10	The simulation developed my clinical reasoning skills	Strongly disagree	Disagree	Unsure	Agree	Strongly agree
11	The simulation developed my clinical decision making ability	Strongly disagree	Disagree	Unsure	Agree	Strongly agree
12	The simulation enabled me to demonstrate my clinical reasoning skills	Strongly disagree	Disagree	Unsure	Agree	Strongly agree
13	The simulation helped me to recognise patient deterioration early	Strongly disagree	Disagree	Unsure	Agree	Strongly agree
14	This was a valuable learning experience	Strongly disagree	Disagree	Unsure	Agree	Strongly agree
Clinical learning						
15	The simulation caused me to reflect on my clinical ability	Strongly disagree	Disagree	Unsure	Agree	Strongly agree
16	The simulation tested my clinical ability	Strongly disagree	Disagree	Unsure	Agree	Strongly agree
17	The simulation helped me to apply what I learned from the case study	Strongly disagree	Disagree	Unsure	Agree	Strongly agree
18	The simulation helped me to recognise my clinical strengths and weaknesses	Strongly disagree	Disagree	Unsure	Agree	Strongly agree

Appendix C: Author's permission



Inspire Simulation website contact submission

Inspire Simulation <Stephen.Guinea@acu.edu.au> Feb 26 (13 days ago)

to me

Someone has submitted the Inspire Simulation contact form on our Concrete5 website.

The following information was sent:

Email:: lpersico@lions.molloy.edu
Name:: Lori Persico PhD(c), RN-BC NPD
Message:: I am a Nurse Educator at the Patient Safety Insitute simulation center and a doctoral student at Molloy College. Debriefing is the area of interest to research . The literature shows a gap as to best practice for debriefing. My study will be comparing two debriefing methods. I am interested to research the difference between each methodology on learners' satisfaction with debriefing, reflection and clinical reason.The items in this instrument measures all these areas.
Please may I have permission to use the SSE scale and the procedure I am to follow if granted permission.
Thank you for your consideration in this matter.
Sincerely,
Lori Persico PhD(c), RN-BC NPD

Tracy Levett-Jones <tracy.levett-jones@newcastle.edu.au> Mar 4 (7 days ago)

to me, Stephen

Hello Lori
You have my permission to use this instrument. All the very best with your research.
Kind regards
Tracy

From: Stephen Guinea [mailto:Stephen.Guinea@acu.edu.au]
Sent: Friday, 27 February 2015 11:06 AM
To: Tracy Levett-Jones
Cc: Patrea Andersen
Subject: FW: Inspire Simulation website contact submission

Good morning Tracy

I hope you are well. Please see the email below from the InSPIRE website.

Appendix D: Reading Assignment for Faculty Training

Directions-Please read the following articles prior to the instructional session

Zigmont, J. J., Kappus, L. J., & Sudikoff, S. N. (2011). The 3D model of debriefing: Defusing, discovering, and deepening. *Seminars in Perinatology*, 52-58.

Sawyer, T. L., & Deering, S. (2013). Adaptation of the US army's after-action review for simulation debriefing in healthcare. *Simulation in Healthcare*, *8*(6), 388-396.

Lea, P., & Leonard, J. M. (2015). Sepsis: Diagnosis and treatment. *NetCE*, 1-26.

Appendix E: Debriefing guidelines training scripts

3D-DDD Method-(Zigmont et al., 2011a, p. 55)

Prebriefing	**Examples**
Purpose: To explicitly state how the learners should participate in the debriefing and how you as the instructor will participate. *Points to Include* o Clarify your role as instructor o Detail your expectations for learner o participation o Explain the format the debriefing will o follow o Tell the learners the length of the session	"My role as an instructor is not to evaluate your performance, but to help facilitate a discussion and prompt self-reflection. I expect you to do most of the talking, raise questions about what was going on, identify issues, and volunteer your perspectives. The format of the discussion is as follows: we are going to debrief in three parts. First, we will have an opportunity to talk about our emotions and the impact of the simulation. Next, we will clarify the clinical details of the scenario. During the second part, you will analyze your own performance and evaluate how well the management of those situations worked. Our goal during this phase is to discover your mental model that guided your behavior and then talk about that mental model utilizing all the experience in the room. We we'll then connect new learning to future clinical situations. Finally we'll summarize key learning points."

Defusing Purpose: To allow learner to "vent" emotions. To recap and clarify what happened during the scenario. To conduct a needs analysis of objectives important to the learner. *Points to Include* o Elicit reactions and emotions o Describe what happened	"How did it feel to be part of that scenario?" "Thank you for bringing that up . . . Let's hold that thought and come back to it during the second part of the debriefing . . ." "Let's recap WHAT happened during that scenario so that we can then discuss WHY during the second part of the debriefing."
Discovering Purpose: To analyze and evaluate performance through reflection. To discover mental models or rationale for specific behaviors through Inquiry. To identify gaps/matches between existing and targeted mental models. *Points to Include* - Identify an observed behavior or outcome o Ask a question to discover the mental model guiding that action o Cue Individual to make/identify analogy/ connection to Target Mental Model	"Person A, I noticed that you did x in y situation. I was curious about that action because . . . (instructor offers his own mental model about how to deal with y). Can you tell me why you did x?" "Thanks for sharing the rationale. Has anyone else every experienced this? What did you do to deal with that situation and why?" "Person A, how might this situation have been different if you had used that strategy". Or "Another way to handle x is z (target mental model). If you had done z, how would that change y?"

Deepening Purpose: To apply lessons from simulation and make connections to clinical practice. *Points to Include* o Prompt learner to connect new learning to larger clinical environment	"If you were to encounter a similar situation in the future, how would you handle it?" "How can you use the information we just discussed in your clinical practice?" "Can you think of other situations where this information could be applied?"
Summary Purpose: To review what was learned throughout the session Points to Include o Highlight the key objectives and lessons learned	"Today we learned the following: . . ." "Let's end with this . . . What is one thing that you can take away from this session to use in your practice?"

DEBRIEF Method-(Sawyer & Deering, 2013, p. 390)

Define rules	How are we going to do this debriefing?
Explain learning objectives	What was this simulation designed to teach?
Benchmarks for performance	What performance standards were evaluated?
Review what was supposed to happen	What did the facilitator intend to happen?
Identify what happened	What actually happened?
Examine why	Why did things happen the way they did?
Formalize learning	What went well, what did not go well, and what would you do different next time?

Appendix F: Molloy College IRB Approval

Molloy College

1000 Hempstead Avenue
Rockville Centre, NY 11571
www.molloy.edu

Tel. 516.323.3653
Tel. 516.323.3801

Date: August 17, 2015
To: Lori Persico
From: Kathleen Maurer Smith, Ph.D.
Co-Chair, Molloy College Institutional Review Board
Patricia Eckardt, Ph.D., RN
Co-Chair, Molloy College Institutional Review Board

SUBJECT: **MOLLOY IRB REVIEW AND DETERMINATION OF EXEMPT STATUS**
Study Title: **The Comparison of Debriefing Methods on Clinical Reasoning, Psychological Safety, and Learner Satisfaction in Simulation-based Education**
Approved: **August 17, 2015**

Dear Lori:

The Institutional Review Board (IRB) of Molloy College has reviewed the above-mentioned research proposal and determined that this proposal is approved by the committee **pending NSLIJ IRB approval**. It is EXEMPT from the requirements of Department of Health and Human Services (DHHS) regulations for the protection of human subjects as defined in 45CFR46.101(b). Please note that as Principal Investigator (PI), it is your responsibility to be CITI Certified and submit the evidence in order to conduct your research.

You may proceed with your research. Please submit a report to the committee at the conclusion of your project.

Changes to the Research: It is the responsibility of the Principal Investigator to inform the Molloy College IRB of any changes to this research. A change in the research may disqualify the project from exempt status.

Sincerely,

Kathleen Maurer Smith, Ph.D.

Patricia Eckardt, Ph.D., RN

Appendix G: North Shore-LIJ Health System IRB Approval

Institutional Review Board
FWA #00002505
Office of the Human Research Protection Program
3333 New Hyde Park Road, Suite 317
New Hyde Park, NY 11042
Phone: 516-719-3100 or 516-321-2100
Fax: 516-321-2125

To: Lori Persico
1979 MARCUS AVE
LAKE SUCCESS, NY 11042

From: Hallie Kassan, MS, CIP
Director, Human Research Protection Program

Date: 02-Nov-2015

Re: **IRB #:** HS15-0662
Protocol Title: The Impact of Debriefing Methods on Learning Outcomes Clinical Reasoning, Satisfaction with Learning and Debriefing.

Dear Lori Persico,

The Feinstein Institute for Medical Research has confirmed that the above referenced study has obtained appropriate approvals. The following is confirmed:

- IRB approval
- Institutional Approval

The above referenced study now has institutional approval for commencement at the following North Shore-LIJ Health System locations.

- Patient Safety Institute- CLI

Any additional NSLIJHS facilities must be approved by the applicable facility executive director and communicated to the Clinical Research Service.

Appendix H: Informed consent

Title of study: The Impact of Debriefing Methods on Learning Outcomes Clinical Reasoning, Satisfaction with Learning and Debriefing

Principal investigator: Mrs. Lori Persico RN, MS

Institute: Molloy College, Rockville Centre, New York 11570

Purpose of this research study

Purpose of the study is to

- Compare the two different debriefing methods on the learner's perception of psychological safety, satisfaction with development of clinical reasoning skills, and satisfaction with learning**.**
- The two debriefing methods to be investigated during a simulation-based introduction to clinical practice orientation program. The methods to be used are the 3D Model of Debriefing: Defusing, Discovering and Deepening and DEBRIEF model.

Procedures

Subjects will be divided into two groups. Each group will participate in a clinical scenario and then be debriefed using and the 3D Model of Debriefing: Defusing, Discovering and Deepening and DEBRIEF model. Subjects will anonymously perform an exam and then fill out a survey anonymously.

Possible risks or benefits

There is no risk involved in this study. However, the results of the study may help us to formulate guidelines for the debriefing techniques. The study will be published but there are no subject identifiers.

Right of refusal to participate and withdrawal

You are free to choose to participate in the study. You may refuse to participate or withdraw any time from the study without any prejudice or adverse effect to the grading of your assignment submission.

Confidentiality

All information you supply during the research will be held in confidence to the extent provided by the law and unless you specifically indicate your consent, your name will not appear in any report or publication of the research.

The group information will be assigned a code number. The list of group number and informed consent form will be kept in a locked file in my office. When the study is completed and the data have been analyzed, the list will be destroyed.

Available Sources of Information

If you have any further questions you may contact Principal Investigator (Mrs. Lori Persico), on following phone number (516) 396-6150 or by e-mail lpersico@lions.molloy.edu).

- Furthermore, should you have any questions with regard to your rights of participation; you may contact the IRB office (516) 321-2100.
- Employee's Assistance Program is available to all subjects participating in the study. You may contact the office at (1-877) 327-4968.

Investigator's Declaration
I have explained and defined in detail the research procedures in which the subject has consented to participate.

Participant's Consent Declaration

I understand that participation is voluntary. Refusal to participate will involve no penalty. I understand that I may discontinue participation at any time without penalty or loss of accrued benefits (Benefits are accrued in proportion to the amount of study completed or as otherwise stated by the researcher) to which I am otherwise entitled.

Subject's Signature_____ Date_____

Appendix I: Simulated Environment Room

1. HPS at 30 degrees, sitting up with a patient gown.
2. Appropriate genitalia for each scenario.
3. ID band for each scenario – displaying the patient's last name, first name and date of birth.
4. Monitor displaying cardiac rhythm, rate, pulse oximeter, blood pressure, respiratory rate and temperature.
5. Bedside nightstand with bag valve mask, non-rebreather and nasal cannula.
6. Box of gloves – each size small, medium and large
7. Bedside portable monitor with defibrillator on top of crash cart.
8. Oxygen flow meter
9. Wall suction
10. Laptops for HPS and Audio-visual equipment

Appendix J: Role Cards

Primary RN #1 role card:

- After receiving report the objectives are to:
    - Perform in the role of the primary nurse
    - Begin a head to toe assessment
    - Manage any problems that may arise

*****If you determine that help is needed in order to manage the care of the patient, open the door and call out for help.**

Secondary Staff nurse role card (RN#2):

Description: You work are a staff nurse working on the same patient care unit as the primary RN, but you have your own district of patients.

Role objective is:

1. Only when help is called, enter the room to assist your colleague with the management of the patient situation.

Concerned Family member role card:

Description:

You are the sibling of the patient and their designated support person. The patient did not notify you of hospitalization. It has taken three hours to arrive and you waited 1 hour to see the patient.

Role objectives are:

1. *Only when* help is called, you will enter the room along with other people standing the hallway with you.
2. You are to be frantic, overwhelmed and persistent in asking for information about your family member's condition- i.e. - "What is going on, why is she like this, Is she going to die, where is the doctor?"

PA/NP role card:

Description: You are the midlevel provider on call for all of the patients on the patient care unit.

Role objectives are:

1. *Only when* help is called to assist, respond to the patient situation accordingly.
2. Perform an independent, hands-on, focused physical assessment
3. Develop and communicate the plan of care according to clinical condition

Appendix K: Bedside Handoff Script

Introduction: The patient name is Ann Smythe and is assigned to you.

Background: She is a 65-year-old woman admitted to the hospital. The patient is a direct admission to with the rule out chest pain. All labs and EKG from PMD are normal.

She had an episode of chest pain with shortness of breath and a productive cough. The past medical history is congestive heart failure, and hypertension. The patient is compliant with her medications. The daily medications the patient is currently receiving are Lasix 20mg and Vasotec 10 mg.

Appendix L: Computer programming scenario script

Scenario –Sepsis

Initial programmed settings

Cardiac monitor ----------Display on

Displayed Cardiac rhythm----------none

Temperature----------100.8 F

Heart rate (HR)----------100 Sinus Rhythm

Blood Pressure (B/P)----------108/60

Respiratory Rate (RR)----------26

Pulse Oximeter (O2 Sat) - 94 % on Room Air

Handlers and trends-

- Four-minute mark of scenario- patient is more lethargic, alert and responsive; the cardiac monitor will project sinus tachycardia- HR 120, B/P 85/50, RR 32 and the O2 sat 90%.
    - Vocal sounds---------- Speak as if SOB, can't complete sentences."Feel like I am going to pass out".
- Only after the administration of oxygen therapy, intravenous fluids, blood cultures and antibiotics the patient is less lethargic and the HR sinus rhythm 90, B/P 110/70, RR 22 and the O2 sat 95%.

Appendix M: Script for opening and ending scenario

Opening scenario script – You may begin

Ending the scenario script – Thank you, the scenario has ended. Please follow me. I will take you to the debrief room.

Appendix N: 3D-DDD Severe Sepsis Debriefing guide (Zigmont et al., 2011a, p. 55)

Pre-briefing Purpose: To explicitly state how the learners should participate in the debriefing and how you as the instructor will participate. *Points to Include* o Clarify your role as instructor o Detail your expectations for learner o participation o Explain the format the debriefing will o follow Tell the learners the length of the session	➢ My role as an instructor is not to evaluate your performance, but to help facilitate a discussion and self-reflection. ➢ I expect you to participate by doing most of the talking, asking questions about what was going on, recognize/identify any issues, and express your perspectives in a professional manner ➢ The format of the debrief discussion is going to occur in three parts. It will take about 20 o **First-** we will have an opportunity to talk about our emotions and the impact of the simulation o **Second-** we will clarify the clinical details of the scenario by asking reflective questions. The goal is to discover what mental models lead to that clinical decision. o **Third**- together we will then connect new learning to future clinical situations followed by a summary of key learning points.
Defusing Purpose: To allow learner to "vent" emotions. To recap and clarify what happened during the scenario. To conduct a needs analysis of objectives important to the learner.	1. How did it feel to be part of that scenario?" 2. "Thank you for bringing that up. . . Let's hold that thought and come back to it during the second part of the debriefing. . ." 3. "Let's recap WHAT happened during that scenario so that we can then discuss WHY during the second part of the debriefing."
Deepening Purpose: To apply lessons from simulation and make connections to clinical practice. *Points to Include* o Prompt learner to connect new learning to larger clinical environment	1. "If you were to encounter a similar situation in the future, how would you handle it?" 2. "How can you use the information we just 3. discussed in your clinical practice?" 4. "Can you think of other situations where this information could be applied?"
Summary Purpose: To review what was learned throughout the session	1. Today we learned the following:. . ." 2. "Let's end with this. . .

Points to Include Highlight the key objectives and lessons learned	3. What is one thing that you can take away from this session to use in your practice?”

Appendix O: DEBRIEF Severe Sepsis Debriefing guide (Sawyer & Deering, 2013)

Define rules How we are going to do this debrief?	In the next 20 minutes, I will help facilitate a discussion: it's to promote self-reflection and to help identify what was going on. All are expected to participate, be engaged, do most of the talking and ask questions. We will review what was learned today.
Explain learning objectives What performance standards were evaluated?	The objectives are: • Perform a physical assessment • Perform a focused assessment • Identify the clinical problem • Teamwork and communication • Inclusion of family/significant other into the plan of care.
Benchmarks for performance What are the performance benchmarks?	Some standards to consider are: • Collecting clinical data in an organized approach • Communicate using –Team STEPPS™ • Policy and procedure visitors Clinical indicators for escalation/ rapid response team
Review what was supposed to happen What did the facilitator intend to happen? What is the cause for the change in the condition?	• Perform a physical assessment moving to a focused assessment • Identify the change in the clinical condition and the cause • Teamwork and communication Communication with family/significant

Identify what happened What actually happened? What is the cause for the change in the condition? **E**xamine why Why did things happen the way they did? Help me understand why?	• Who can walk me thorough the case? • What concerned you the most? What were some of the differentials you were considering? • Looking back, could the clinical problem be related to an infection? What data or criteria supports this? Where is the patient in the continuum of sepsis? • As the provider and secondary nurse, how was the handoff? • I noticed when the team came in tasks were completed, how did this happen? • How was it for you as the family member? • Team what strategies did you use to include the family? • I notice you did **X** in **Y** situation, help me understand. I have a concern; I noticed that **X** and this may cause **Y.** How do you see it?
Formalize learning	Let's go around the room and state one thing you learned from this simulation and debrief. Let's avoid repeats.

Appendix P: Systemic inflammatory responses syndrome (SIRS) and stages of sepsis resource guide

SIRS Criteria	**Sepsis**
Fever of more than 38°C (100.4°F) or less than 36°C (96.8°F) Heart rate of more than 90 beats per minute Respiratory rate of more than 20 breaths per minute or arterial carbon dioxide tension (PaCO 2) of less than 32 mm Hg Abnormal white blood cell count (>12,000/µL or < 4,000/µL or >10% immature [band] forms)	Suspected infection with 2 or more SIRS criteria **Severe Sepsis** Suspected or documented infection and organ dysfunction **Septic Shock** Severe Sepsis and persistent hypotension that does not respond to appropriate fluid resuscitation

Appendix Q: Faculty Consent

Title of study: The Impact of Debriefing Methods on Learning Outcomes Clinical Reasoning, Satisfaction with Learning and Debriefing

Principal investigator: Mrs. Lori Persico RN, MS

Institute: Molloy College, Rockville Centre, New York 11570

Purpose of this research study

Purpose of the study is to

- Compare the two different debriefing methods on the learner's perception of psychological safety, satisfaction with development of clinical reasoning skills, and satisfaction with learning**.**
- The two debriefing methods to be investigated during a simulation-based introduction to clinical practice orientation program. The methods to be used are the 3D Model of Debriefing: Defusing, Discovering and Deepening and DEBRIEF model.
- To understand the faculty perspective in facilitating the 3D Model of Debriefing: Defusing, Discovering and Deepening and DEBRIEF model.
- To understand the faculty perspective in meeting learning objectives using the 3D Model of Debriefing: Defusing, Discovering and Deepening and DEBRIEF model

Procedures

Subjects will be divided into two groups. Each group will participate in a clinical scenario and then be debriefed using and the 3D Model of Debriefing: Defusing, Discovering and Deepening and DEBRIEF model. Subjects will anonymously perform an exam and then fill out a survey anonymously.

Faculty received training in each of these models to facilitate the debriefing component of the simulated scenarios for the introduction to clinical practice orientation program

Possible risks or benefits

There is no risk involved in this study. However, the results of the study may help us to formulate guidelines for the debriefing techniques. The study will be published but there are no subject identifiers.

Right of refusal to participate and withdrawal

You are free to choose to participate in the study. You may refuse to participate or withdraw any time from the study without any prejudice or adverse effect to the grading of your assignment submission.

Confidentiality

This is an anonymous survey. There are no employee identifiers. All information you supply during the research will be held in confidence to the extent provided by the law and unless you specifically indicate your consent, your name will not appear in any report or publication of the research.

Available Sources of Information

If you have any further questions you may contact Principal Investigator (Mrs. Lori Persico), on following phone number (516) 396-6150 or by e-mail lpersico@lions.molloy.edu).

- Furthermore, should you have any questions with regard to your rights of participation; you may contact the IRB office (516) 321-2100.
- Employee's Assistance Program is available to all subjects participating in the study. You may contact the office at (1-877) 327-4968.

By clicking on the link provided, you have consented to participate in the online survey

Appendix R: Orientation Faculty Survey

Directions: Please click to select the best answer. Please round to whole numbers.

1. What is your age in years? Please write number of years_____.
2. What is your gender?
    a. Male
    b. Female
3. Please circle to indicate race/ethnicity
    a. American Indian or Alaska Native
    b. Asian
    c. Black or African American
    d. Native Hawaiian or Other Pacific Islander
    e. Hispanic or Latino
    f. Not Hispanic or Latino
    g. White
    h. Race/ethnicity unknown
    i. Multi-racial
4. What is your highest degree earned in *nursing*?
    a. Bachelor
    b. Masters
    c. Doctorate
5. Please indicate experience as a nurse educator in years.
    a. Number of years_____
    b. If less than one year check this box ☐

c. Please indicate numbers of year with simulation-based education_____

Please read each question carefully and please summarize answers.

1) What were the positive attributes of the 3D-DDD model?
2) What was the most challenging component of the 3D-DDD model?
3) What were the positive attributes of the DEBRIEF model?
4) What was the most challenging component of the DEBRIEF model?
5) Which of the methods were learning outcomes best met? Please give examples.
6) What changes would you make to the simulated scenario?
7) What changes would you make in the debriefing?
8) What is your perceived level of competency for the 3D-DDD model?
9) What is your perceived level of competency for the DEBRIEF model?