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Nursing Students' Perceived Value of the Pre-briefing Phase of Simulation

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THE IMPACT OF PREBRIEFING PHASE ON
UNDERGRADUATE NURSING SIMULATION

Presented in Partial Fulfillment of the
Requirements for the Degree of
Doctor of Philosophy in Nursing Education

Nova Southeastern University

Jill Chamberlain
2016

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Abstract

As technology has grown, many healthcare professions' programs, including nursing, have incorporated simulation into their curricula. Overwhelmingly, research has highlighted the last phase of simulation, debriefing, as the most important component influencing learning outcomes, with limited focus on prebriefing. The purpose of this study was to describe the influence the prebriefing phase during simulation has on undergraduate nursing students' perceptions of overall simulation effectiveness, learning, and self-confidence. Situated learning theory was selected to guide the research design due to its unique view that learning is a social process that is enhanced within the authentic environment. The quasi-experimental design study compared outcomes among 4 groups: (a) no prebriefing, (b) prebriefing learning-engagement and orientation activities, (c) prebriefing orientation activities only, and (d) prebriefing learning-engagement activities only. Findings of the study indicated that undergraduate nursing students' perceptions of overall simulation effectiveness ($p = .000$), learning ($p = .000$), and self-confidence ($p = .000$) were significantly higher with the use of prebriefing compared to no prebriefing; however, there was no significant distinction ($p > .05$) among which activity in prebriefing (learning-engagement activities or orientation tasks) was most valued by students. Observations made during the study support the need for both learning-engagement and orientation activities during prebriefing to enhance overall simulation effectiveness.

Keywords: simulation, prebriefing, debriefing, situated learning theory, undergraduate nursing students

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Chapter 1

The Problem and Domain of Inquiry

The International Nursing Association for Clinical Simulation and Learning (INACSL, 2011) defined simulation as a pedagogy used to promote a learner's progression from novice to expert. Simulation has been instituted in many professions for decades such as aviation, military, and medical schools. As technology has grown, many healthcare profession programs' including nursing have incorporated simulation into their curriculums (Kamerer, 2012), especially high-fidelity simulation (HFS). HFS describes the simulation experiences that utilize full scale computerized patient simulators that facilitate a high level of interaction and realism for the learner (INACSL, 2011).

There are three phases to simulation: before, during, and after. INACSL (2011) describes the before phase as *prebriefing*, the during phase as the *simulation scenario*, and the after phase as *debriefing*. The increased utilization of simulation in the past decade has increased simulation research exponentially, particularly focusing on the debriefing phase of simulation (Dieckmann, Friis, Lippert, & Ostergaard, 2009; Fanning & Gaba, 2007; Kuiper, Heinrich, Matthias, Graham, & Bell-Kotwall, 2008; Neill & Wotton, 2011) and outcomes of simulation (Burns, O'Donnell, & Artman, 2010; Shinnick, Woo, & Evangelista, 2012; Sullivan-Mann, Perron, & Fellner, 2009). The most common simulation outcomes identified in the literature include knowledge, performance, self-confidence, and satisfaction (Elfrink Cordi, Leighton, Ryan-Wenger,

Doyle, & Ravert, 2012; Swanson et al, 2011; A. Weaver, 2011; Wilson & Klein, 2012). Nevertheless, there is an identified gap in the nursing literature regarding the prebriefing phase of simulation, which is the focus of this study.

Problem Statement

Overwhelmingly, research has highlighted the last phase of simulation, debriefing, as the most important component influencing learning outcomes (Chronister & Brown, 2012; Mariani, Cantrell, Meakim, Prieto, & Dreifuerst, 2012; Reed, Andrews, & Ravert, 2013; Shinnick et al, 2011; Thomas Dreifuerst, 2012). However, debriefing studies have not accounted for the prebriefing phase as a potential influential variable to the studies' findings (Chronister & Brown, 2012; Dreifuerst, 2012; Mariani et al., 2012; Reed et al., 2013; Shinnick et al, 2011), even though some evidence has demonstrated prebriefing affects satisfaction, participation, and effectiveness of the simulation experience (Elfrink, Nininger, Rohig, & Lee, 2009; Nelson & Leighton, 2010). The problem regarding prebriefing is that limited formal evidence and best practices have been identified in the literature to support prebriefing.

Purpose of the Study

The purpose of this study was to describe the influence of the prebriefing phase during simulation on undergraduate nursing students' perceptions of overall simulation effectiveness, learning, and self-confidence. The findings of this study provide formal evidence in guiding the use of prebriefing in simulation.

Research Questions and Hypotheses

The following were research questions for the study:

1. What is the difference among undergraduate nursing students' perceptions of overall simulation effectiveness with the use of prebriefing orientation and learning-engagement activities compared to no prebriefing?
2. What is the difference among undergraduate nursing students' perceptions of learning with the use of prebriefing orientation and learning-engagement activities compared to no prebriefing?
3. What is the difference among undergraduate nursing students' perceptions of self-confidence with the use of prebriefing orientation and learning-engagement activities compared to no prebriefing?
4. What is the difference among undergraduate nursing students' perceptions of overall simulation effectiveness with the use of orientation activities in prebriefing compared to the use of learning-engagement activities in prebriefing?
5. What is the difference among undergraduate nursing students' perceptions of learning with the use of orientation activities in prebriefing compared to the use of learning-engagement activities in prebriefing?
6. What is the difference among undergraduate nursing students' perceptions of self-confidence with the use of orientation activities in prebriefing compared to the use of learning-engagement activities in prebriefing?

The hypotheses for the study were the following:

- H1. Undergraduate nursing students' perceptions of overall simulation effectiveness would be significantly higher with the use of prebriefing orientation and learning-engagement activities compared to no prebriefing.

H1₀ was that there would be no significant difference between undergraduate nursing students' perceptions of overall simulation effectiveness with the use of prebriefing orientation and learning-engagement activities compared to no prebriefing.

H2. Undergraduate nursing students' perceptions of learning would be significantly higher with the use of prebriefing orientation and learning-engagement activities compared to no prebriefing. H2₀ was that there would be no significant difference between undergraduate nursing students' perceptions of learning with the use of prebriefing orientation and learning-engagement activities compared to no prebriefing.

H3. Undergraduate nursing students' perceptions of self-confidence would be significantly higher with the use of prebriefing orientation and learning-engagement activities compared to no prebriefing. H3₀ was that there would be no significant difference between undergraduate nursing students' perceptions of self-confidence with the use of prebriefing orientation and learning-engagement activities compared to no prebriefing.

H4. Undergraduate nursing students' perceptions of overall simulation effectiveness with the use of prebriefing learning-engagement activities only would be significantly higher compared to prebriefing orientation activities only in prebriefing. H4₀ was that there would be no significant difference between undergraduate nursing students' perceptions of overall simulation effectiveness with the use of prebriefing learning-engagement activities only compared to prebriefing orientation activities only.

H5. Undergraduate nursing students' perceptions of learning with the use of prebriefing learning-engagement activities only would be significantly higher compared to prebriefing orientation activities only in prebriefing. H5₀ was that there would be no significant difference between undergraduate nursing students' perceptions of overall learning with the use of prebriefing learning-engagement activities only compared to prebriefing orientation activities only.

H6. Undergraduate nursing students' perceptions of self-confidence with the use of prebriefing learning-engagement activities only would be significantly higher compared to prebriefing orientation activities only. H6₀ was that there would be no significant difference between undergraduate nursing students' perceptions of self-confidence with the use of prebriefing learning-engagement activities only compared to prebriefing orientation activities only.

Significance of the Study

Nursing Education

The pedagogical approach of simulation is employed in nearly 90% of all nursing programs (Hayden, 2010). There are many reasons for the increased use of simulation, including the availability of simulators, the assumption that learning in the realistic environment can be transferred to clinical practice, and limited clinical practice sites (Cordeau, 2012). With the increase in simulation utilization, faculty must ensure simulation implementation is based on best evidence (Foronda, Liu, & Bauman, 2013; Gore, Van Gele, Ravert, & Mabire, 2012), in particular which elements of simulation

influence learning the most (Prion & Adamson, 2012). This study's findings formally identify the importance of prebriefing, similar to the evidence of the effectiveness of debriefing (Dreifuerst, 2012; Fanning & Gaba, 2007; INASCL, 2011; Neill & Wotton, 2011).

A component included in prebriefing is teamwork (Arafeh, Snyder Hansen, & Nichols, 2010; Beattie, Koroll, & Price, 2010; Husebo, Friberg, Soreide, & Rystedt, 2012; Morrison & Catanzaro, 2010). Teamwork has been identified by Quality and Safety Education for Nurses (QSEN) as a core competency that is essential to nursing practice (Sherwood & Zomorodi, 2014). The prebriefing phase of simulation engages the learners in the process of teamwork and collaboration (Chamberlain, 2015) and could be a vital avenue in incorporating this QSEN competency into the nursing curriculum.

Nursing Practice

In order to provide effective patient care, healthcare team members must work effectively as a team and communicate patient healthcare status and plan of care (Aebersold, Tschannen, & Sculli, 2013). A strategy that has been used to enhance healthcare team members' communication and teamwork is the crew resource-management (CRM) training system. CRM is a team-skills training program developed in the 1980s in the field of aviation to reduce errors and since adopted in the healthcare industry (Aebersold et al., 2013; Clay-Williams, Greenfield, Stone, & Braithwaite, 2014; Kleiner, Link, Maynard, & Carpenter, 2014; O'Dea, O'Conner, & Keogh, 2014; Paull, DeLeeuw, Wolk, Paige, Nelly, & Mills, 2013; Tschannen, McClish, Aebersold, & Rohde, 2015).

The use of CRM with simulation is becoming more common (Aebersold et al., 2013; Clay-Williams et al., 2014; O’Dea et al., 2014; Paull et al., 2013; Tschannen et al., 2015). Simulation provides an opportunity for participants to apply their CRM training in a realistic environment. The majority of research studies have reported participants perceived that CRM training with simulation improved communication and teamwork (Clay-Williams et al., 2014; O’Dea et al., 2014; Paull et al., 2013; Tschannen et al., 2015). As mentioned previously, the prebriefing phase of simulation engages the learners in the process of teamwork and collaboration (Chamberlain, 2015) and could be a vital avenue in incorporating CRM training into the healthcare environment.

Nursing Research

Although a growing amount of research has demonstrated the effectiveness of simulation (Kardong-Edgren, 2012; Laschinger et al., 2008; Shin, Park, & Kim, 2015; A. Weaver, 2011), the call for more robust research in the pedagogy of simulation has been vast (Brewer, 2011; Fisher & King, 2013; Foronda et al., 2013; Norman, 2012; A. Weaver, 2011). Existing simulation evidence often has been based on self-reported data (Foronda et al., 2013) and lacking in a guiding theoretical framework (Sanford, 2010; A. Weaver, 2011). Recommendations to improve the robustness of simulation research include using validated tools (Brewer, 2011), randomized control trials (Fisher & King, 2013), and larger student populations (Foronda et al., 2013; Hyland & Hawkins, 2009). This study utilized situated learning theory (SLT) as the guiding framework and the validated tool, the Simulation Effectiveness Tool (SET).

In addition, gaps identified in simulation literature need to be studied to enhance the pedagogy of simulation, such as new theories and models for simulation (A. Weaver,

2011), the effects of simulation teaching strategies (Hyland & Hawkins, 2009; Paige & Morin, 2013; A. Weaver, 2011), and transfer of simulation outcomes into the clinical setting (Foronda et al., 2013; Norman, 2012; Sanford, 2010; A. Weaver, 2011). This study's findings assist in closing the literature gap regarding the practice of prebriefing and offers recommendations for future research.

Public Policy

Clinical organizations continue to demand graduate nurses who have highly developed critical thinking and practice skills to ensure positive patient outcomes (White, Brannan, Long, & Kruszka, 2013). Due to these pressures, many national nursing organizations have been studying various teaching pedagogies to determine their effectiveness on practice. For example, the National Council of State Boards of Nursing discovered in a landmark study (Hayden, Smiley, Alexander, Kardong-Edgren, & Jeffries, 2014) that the teaching strategy of HFS can substitute for up to half of student clinical practice hours and produce the same educational outcomes and practice readiness as full student clinical setting practice hours. These outcomes would be dependent on high-quality programs and faculty educated in the pedagogy (Hayden et al., 2014), thus influencing program policy and accreditation standards. The National League of Nursing (NLN, 2015) instituted the Simulation Innovation Resource Center to develop a network of nursing faculty using simulation to promote and evaluate simulation in nursing education. This study's findings regarding prebriefing practices add to the evidence pedagogy of simulation supporting and enhancing the quality of the simulation programs.

Philosophical Underpinnings

The paradigm chosen as a framework for the study is postpositivism.

Postpositivism is a popular research paradigm within the nursing discipline (K. Weaver & Olson, 2006). Postpositivism transpired with Sir Karl Popper's (1902–1994) call for scientists to test a theory to be false instead of the positivist stance of testing a theory to be true (Crotty, 2010). Thomas Kuhn (1922–1996) also influenced the philosophical views of postpositivism in questioning the unbiased nature of scientific research.

Another prominent contribution to the lens of postpositivism is from Paul Feyerabend (1924–1994). He maintained that the application of the scientific model is more chaotic than its precise systematic image appears to be (Creswell, 2014; Crotty, 2010). Crotty (2010) listed the underlying assumptions of postpositivism as absolute truth can never be found, research is never perfect, research focuses on rejecting the hypothesis, data influence knowledge, data are collected by measures completed by the participants, and research seeks to describe relationships of interest.

Theoretical Framework

The study's hypotheses are rooted in SLT, also known as situated cognition theory. SLT considers learning as a social phenomenon rather than the action of an individual assimilating knowledge (Stein, 1998). Lave and Wenger (1991) are the founders of SLT and stated that the gain of knowledge and skill requires the learner to fully participate in the practices of the community setting. The theory's fundamental assumptions are (a) learning, transformation, and change are a connected process, and (b) communities are engaged in learning relations between young learners and master learners (Lave & Wenger, 1991). SLT is often compared to an apprentice-like situation

such as a carpenter or artist (Lui & Su, 2009). The principles of SLT can be found among various disciplines such as education, business, and computer science (Gieselman, Stark, & Farruggia, 2000). SLT is commonly found in nursing education and in particular with the teaching intervention of HFS, due to its focus on participative teaching methods (Holland et al., 2013; Kaakinen & Arwood, 2009; Onda, 2011; Paige & Daley, 2009; Rourke, Schmidt, & Garga, 2010).

Theoretical Assumptions

Stein (1998) stated that SLT has four major principles that distinguish it from other forms of knowledge development: (a) Learning is built in everyday interactions; (b) situational knowledge transfers to like situations; (c) learning is the result of social interaction process; and (d) learning environments are composed of actors, actions, and situations. Assumptions of SLT include (a) active teaching methods are utilized to acquire knowledge, (b) knowledge is obtained through interactions with other learners and their environment, (c) knowledge is elicited from environmental cues and dialogue of learner community rather than structured by the instructor, and (d) practice is utilized to perfect the newly learned knowledge (Lave & Wenger, 1991).

The elements of the prebriefing phase reflect the theoretical framework of SLT. Prebriefing practices, in particular learning-engagement activities, involve interactions among the group that includes young learners (students) and master learners (faculty). Learning is elicited from environmental cues (engagement activities) and dialogue within the learner community (Lave & Wenger, 1991).

Definition of Terms

The Constructs

The constructs of learning and self-confidence often have been identified as a main measure for simulation effectiveness (Elfrink Cordi et al., 2012; O'Donnell, Decker, Howard, Levett-Jones, & Miller, 2014; Swanson et al., 2011; A. Weaver, 2011; Wilson & Klein, 2012) and were used as the constructs for the study. The SET designed by Elfrink Cordi et al. (2012) was used to measure the constructs.

Theoretical Definitions

Simulation. Simulation is a pedagogy to facilitate the learner's progression from novice to expert (INASCL, 2011). Simulation education has been widely accepted as teaching method within healthcare programs (Groom, Henderson, & Sittner, 2014; Hayden et al., 2014). The simulation clinical experience includes prebriefing, scenario, and debriefing that take place in a safe and realistic learning environment guided by a facilitator (INASCL, 2011).

Prebriefing. Prebriefing is defined as an information session prior to the simulation scenario, with suggested activities of orientation to the environment and review of objectives for the specific learning scenario (INASCL, 2011). Prebriefing actions can be categorized into orientation tasks or learning-engagement activities that occur prior to the hands-on scenario phase of the simulation (Chamberlain, 2015).

Learning. Learning is defined as an experience where change in behavior occurs, whether based on knowledge, skills, or attitudes (Merriam, Caffarella, & Baumgartner, 2007). The learning experience is a social process whereby knowledge is coconstructed and is most effective when it occurs in an authentic setting (Gieselman et al., 2000; Lave

& Wenger, 1991; Onda, 2011; S. J. Smith & Roehers, 2009). HFS is often used as a conduit for learning (Berragan, 2013, 2014; Harder, 2010; Hyland & Hawkins, 2009; Norman, 2012; O'Donnell et al., 2014).

Self-confidence. Self-confidence is defined as one's belief of success regarding a particular context (Perry, 2011). Developing self-confidence is essential for the nursing student due to its implications in clinical performance (Blum, Borglund, & Parcells, 2010; Leigh, 2008; O'Donnell et al., 2014; Robb, 2012). Perry (2011) stated the theoretical implications of self-confidence in clinical performance include the development of autonomous and quality practice. HFS is often used as a means for learners to increase their self-confidence regarding practice skills and decision making (Bambini, Washburn, & Perkins, 2009; S. J. Smith & Roehers, 2009; Thomas & Mackey, 2012).

Operational Definitions

Learning. Learning is operationally defined as the students' perception of the knowledge and skills obtained from the simulation experience (Elfrink Cordi et al., 2012). Learning was measured by the participating students' view on a 3-point Likert-type scale of *do not agree*, *somewhat agree*, and *strongly agree*.

Self-confidence. Self-confidence is operationally defined as the students' perception of increased skill or knowledge obtained from the simulation experience (Elfrink Cordi et al., 2012). Self-confidence was measured by the student participants' view on a 3-point Likert-type scale of *do not agree*, *somewhat agree*, and *strongly agree*.

Chapter Summary

Many nursing programs are using HFS to ensure undergraduate students are prepared for practice. There is an identified gap in the nursing literature regarding the prebriefing phase and its influence on simulation outcomes, and thus a study examining nursing students' value of prebriefing meeting their simulation learning needs was conducted. A postpositivism lens and the theoretical framework of SLT guided this study. It was hypothesized that learners exposed to prebriefing would report perceptions of overall simulation effectiveness, learning, and self-confidence significantly higher than those of learners with no prebriefing. The study measured the constructs of simulation effectiveness, learning, and self-confidence operationalized by the SET. This study's findings enhance simulation knowledge and practices that support effective outcomes and practice readiness of student nurses.

In the next chapter, a review of the literature is presented that supported the need to study prebriefing. SLT was explored to identify its usefulness in studying and designing the prebriefing phase of simulation and its correlation to practice readiness. The review of literature also demonstrated the value of reflection in the debriefing phase and its applicability to the prebriefing phase. Common measurements of simulation are described, including overall effectiveness, student learning, and self-confidence gains.

Chapter 2

Literature Review

Simulation offers faculty an instructional design strategy that meets the needs of today's learner. Faculty favor simulation because of its interactivity and its ability to be used for teaching knowledge, assessing students' growth, and developing students' clinical reasoning skills in a safe environment (Jeffries, 2005). There are three phases to simulation: before, during, and after (INACSL, 2011).

Overwhelmingly, nursing research has highlighted the last phase of simulation, debriefing, as the most important component influencing learning outcomes (Chronister & Brown, 2012; Dreifuerst, 2012; Mariani et al., 2012; Reed et al., 2013; Shinnick et al., 2011). However, debriefing studies have not accounted for the prebriefing phase as a potential influential variable to the studies' findings (Chronister & Brown, 2012; Dreifuerst, 2012; Mariani et al., 2012; Reed et al., 2013; Shinnick et al., 2011), even though studies have demonstrated that prebriefing contributes to increased satisfaction, participation, and effectiveness of the simulation experience (Elfrink et al., 2009; Nelson & Leighton, 2010).

The purpose of this study was to describe the influence of the prebriefing phase during simulation on undergraduate nursing students' perceptions of overall simulation effectiveness, learning, and self-confidence. The study utilized SLT as a guiding framework.

The literature review involved several search engines, including Cumulative Index to Nursing and Allied Health Literature, PubMed, and ERIC. The major search terms used were *SLT*, *prebriefing*, *debriefing*, *reflection*, and *simulation outcomes* of

overall effectiveness, nursing student self-confidence, and learning. There was no limitation on dates of articles to ensure a comprehensive review was captured as well as original works. Some articles obtained and reviewed were from other healthcare disciplines such as medicine. Articles were then grouped by concept and depth of description. The review yielded a wealth of knowledge regarding the debriefing phase of simulation; however, it was limited in the prebriefing phase and the application of SLT to simulation.

SLT

As introduced in Chapter 1, SLT proposes that knowledge and skill development requires the learner to fully participate in the practices of the community setting (Lave & Wenger, 1991). SLT is often compared to an apprentice-like situation such as a carpenter or artist (Lui & Su, 2009). The principles of SLT can be found among various disciplines such as education, business, and computer science (Gieselman et al., 2000). In nursing practice, SLT is reflected through the team-based approach commonly referred to as teamwork.

Practice

Teamwork in nursing represents one of six core competencies recommended by the QSEN (2014). These competencies were adapted from the Institute of Medicine competencies for nursing in 2003 to improve quality and safety of patient care. The six QSEN competencies are as follows: (a) patient-centered care, (b) teamwork and collaboration, (c) evidence-based practice, (d) quality improvement, (e) safety, and (f) informatics. Teamwork is identified by open communication, respect, and shared

decision making (QSEN, 2014) and has been demonstrated to reduce serious patient harm (Hughes, 2008).

Nursing literature often has associated teamwork and teamwork training in healthcare with CRM and Team Strategies and Tools to Enhance Performance and Patient Safety (TeamSTEPPS). CRM is a team-skills training program developed in the 1980s in the field of aviation to reduce errors and since adopted in the healthcare industry (Aebersold et al., 2013; Clay-Williams et al., 2014; Kleiner et al., 2014; O’Dea et al., 2014; Paull et al., 2013; Tschannen et al., 2015). O’Dea et al.’s (2014) meta-analysis of the literature from 1985–2013 found a large effect on participants’ knowledge ($d = 1.05$) and behavior ($d = 1.25$) related to training in CRM.

CRM has been used to improve teamwork in nursing units (Clay-Williams et al., 2014; Tschannen et al., 2015) and to decrease communication errors in the operating rooms through surgical briefings (Kleiner et al., 2014). Surgical briefings include a 5- to 10-minute interprofessional meeting prior to the patient surgery for discussions regarding safety concerns and plan of action (Ali, Osborne, Bethune, & Pullyblank, 2011; Allard, Bleakley, Hobbs, & Vinnell, 2007; Papaspyros, Javanqula, Adluri, & O’Regan, 2010). Below are examples of surgical briefings and identified elements that are similar to the elements identified in the simulation prebriefing process.

Ali et al. (2011) conducted a study to evaluate the impact a surgical briefing had on start times of surgery and staff perceptions of the intervention’s effectiveness. The study was conducted in two teaching hospitals in the United Kingdom and used a briefing tool that included the following discussion points: (a) team member introductions; (b) planned procedure; (c) equipment check; (d) patient positioning; (e) imaging plan; and (f)

patient safety issues such as airway, allergies, circulation, and transfer status. The findings showed no significant difference ($p = .10$) in the start time with the implementation of the surgical briefing. All the surgery staff ($N = 37$) responded to the self-designed survey. The majority of the staff (89%) felt that briefings made them more aware of their cases, and 97% highlighted potential patient problems (Ali et al., 2011).

Papaspyros et al. (2010) reviewed the first 118 cardiac surgery cases that used a self-designed briefing and debriefing tool and interviewed some the staff ($n = 15$) involved in using the tool. The first part of the tool begins with team introductions, equipment checks, discussion of anticipated problems, and plan of surgery. The second part of the briefing tool is specific to the patient, such as identification check, glycemic check, position check, blood availability check, and so on. Upon reviewing the results from the 118 cases using the briefing tool, Papaspyros et al. found only 23% of cases had zero problems and at least 32% of the cases had multiple problems. Identified problems included equipment failure, stocking of anesthesia medications, and communication of plans to wean off cardiopulmonary bypass. Qualitative analysis of the interviews demonstrated that with utilization of the briefing tool, staff felt their opinions were valued. Use of the tool also reinforced professionalism and communication and reminded staff that the patient on the operating table has a name (Papaspyros et al., 2010).

Allard et al. (2007) conducted a survey of operating room staff regarding perceptions of briefing and team communication prior to surgery. Out of 270 surveys distributed in one United Kingdom hospital, 118 surveys were completed and used in the study. The researchers used a closed-item questionnaire that asked the participants if they perceived briefing (team communication prior to surgery) as beneficial to teamwork

and patient safety. The survey also asked respondents to list barriers for not briefing. Allard et al. discovered that 78% of the participants agreed that briefing improves teamwork, 82% agreed that briefing improves patient safety, and 80% would like to see more briefing utilized in the operating rooms. The top reasons for not briefing were perceived loss of time, coordination of whole team, and lack of enthusiasm (Allard et al., 2007).

TeamSTEPPS was developed by the Department of Defense and the Agency for Healthcare Research and Quality (2015) to promote teamwork into practice in order to enhance quality and safety in patient care. The program is rooted in 25 years of research and was developed as a result of the 1999 Institute of Medicine report, *To Err Is Human* (as cited in King et al., 2008). The developers of TeamSTEPPS discovered key elements in the literature delineating mechanisms of teamwork that served as foundational competencies for the TeamSTEPPS initiative (King et al., 2008). One of the eight competencies is comparable to the prebriefing phase of simulation: team and collective orientation. This competency describes the group's interactions of information sharing, strategizing, and participating in goal setting. Team members provide alternative solutions and together determine which solution is best (King et al., 2008).

Similar to CRM, TeamSTEPPS has been utilized in healthcare in the aspiration to improve patient outcomes; however, it is difficult to link the transferability of TeamSTEPPS or training in CRM to patient outcomes (O'Dea et al., 2014). The majority of nursing studies discussing outcomes of CRM and TeamSTEPPS have been based on self-report data. Brodsky et al. (2015) provided TeamSTEPPS workshops to interprofessional groups in a neonatal intensive care unit setting. The researchers had

129 participants complete the workshop out of 136 eligible participants. Brodsky et al. provided the TeamSTEPPS curriculum in a 3-hour workshop, which included videos of ineffective and effective communication and one team briefing that discussed patient status, identified high-risk patients, safety concerns, and plan for the day. Brodsky et al. found in their 2-year postsurvey that staff significantly perceived enhancement in overall teamwork following participation in the workshop ($p < .0001$).

Caylor, Aebersold, Lapham, and Carlson (2015) provided multiprofessional learning with students from nursing, pharmacy, and medicine using a modified TeamSTEPPS training and computerized simulation software, Second Life. The researchers had 21 participants complete an online TeamSTEPPS training module and then work in small interprofessional groups utilizing Second Life software. The groups worked through a mock patient case. Each student had slightly different information regarding the mock patient, so students would be required to utilize TeamSTEPPS and communicate with each other to get the complete patient story. Although Caylor et al. did not find statistical significance ($p > .05$), 77% of the students reported that Second Life helped reinforce the TeamSTEPPS concepts.

Simulation

As noted previously, teamwork is an essential skill for nursing practice. However, many nursing programs do not adequately prepare students in teamwork and its role in patient safety (Madhavanpraphakaran, 2012). Researchers have recommended that the QSEN competency of teamwork be incorporated into simulation design to ensure practice readiness (Brady, 2011; Jarzemsky, McCarthy, & Ellis, 2010; Morrison & Catanzaro, 2010). Many of the identified strategies to implement teamwork into HFS

include before-scenario activities such as the team reviewing policies, reviewing medication calculations, and constructing the nursing plan (Jarzemsky et al., 2010).

Systematic reviews of the literature have revealed that very few HFS studies referenced a learning theory (Kaakinen & Arwood, 2009; Rourke et al., 2010); however, when referenced, SLT was the most frequently cited (Kaakinen & Arwood, 2009). Social interaction is a critical component of SLT (Lave & Wenger, 1991). Lave and Wenger (1991) posited that learning is situational and is dependent on active participation by the newcomers of the group. Situational is defined as the relationship between learning, meaning, and activity (Lave & Wenger, 1991). The activity focuses on interaction with knowledge rather than just receiving knowledge (Lave & Wenger, 1991). Assumptions of SLT include the following: (a) Active teaching methods are utilized to acquire knowledge, (b) knowledge is obtained through interactions with other learners and their environment, (c) knowledge is elicited from environmental cues and dialogue of learner community rather than structured by the instructor, and (d) practice is utilized to perfect the newly learned knowledge (Lave & Wenger, 1991).

SLT is often chosen as a framework for simulation due to the authentic learning environment (simulation center), hands-on interaction, and guidance from experts (Elfrink, Kirkpatrick, Nininger, & Schubert, 2010; Holland et al., 2013; Onda, 2011; Paige & Daley, 2009). Onda (2011) informed readers that the NLN and National Council of State Boards of Nursing both recommended that learning occur in authentic environments guided by experts to enhance higher level thinking skills. These recommendations for authentic learning environments and guidance by an expert are reflective of SLT (Onda, 2011). Onda further stated that SLT's recognition of the

learner's need to reflect on how new information fits with one's prior knowledge is critical for problem-solving skills and occurs in each phase of simulation, including prebriefing.

Paige and Daley (2009) demonstrated how SLT principles can guide simulation design. The authors reported that the first principle regarding transfer of knowledge can be enhanced by creating an authentic environment, and they used the example of a miscalculated drug dose in the classroom versus in a HFS, where the patient responds to the wrong dose. The second principle, construction of meaning within the community, can be illustrated through simulation by having the patient ask questions that the learner has to respond to, which will reflect the learner's level of understanding. The third principle is prior knowledge brought into a situation. Simulation activities such as reflection can bring learners' prior knowledge and development, helping students formulate connections. The last principle is in regards to cultural practices. Reflection activities can enlighten learners of different perspectives in the healthcare culture (Paige & Daley, 2009).

Elfrink et al. (2010) used SLT in guiding their exploratory study to determine if simulation improved knowledge retention. The authors utilized SLT because of its focus on learning in context such as HFS. In the study, students were given two knowledge assessment questions prior to the simulation. Students then participated in a group planning session before completing the simulation, followed by debriefing and answering the same two knowledge questions. These questions were then added to the course final exam. The pretest–posttest comparison demonstrated a significant ($p = .000$) increase in

knowledge scores. Retention knowledge scores demonstrated significance ($p = .005$) from simulation to final exam (Elfrink et al., 2010).

Holland et al. (2013) used SLT to design their simulation experiences into a community of practice that actively engaged students into the integration of theory and practice. The authors combined standardized, high-fidelity, and virtual simulation to create a contextual learning experience that reflected SLT by emphasizing learning in context and learning in a community of practice. Holland et al. did not formally evaluate their teaching strategy; however, anecdotal student comments indicated student learning and its translation into practice.

Wyrostok, Hoffart, Kelly, and Ryba (2014) utilized SLT to design their end-of-life care presimulation activities. The authors reported that simulation learning is a process that can be used for learners to practice in realistic settings to build their skills and comprehension with other learners, which is reflective of SLT. Wyrostok et al. had three 90-minute activities 1 week prior to the simulation, where students were divided among groups, guided by a facilitator, to discuss issues surrounding end-of-life care. The scenario was adapted from an NLN scenario template regarding a Muslim whose anticipated death is near. After the scenario, the group had a 45-minute debriefing. The authors then used a self-awareness and self-efficacy inventory to measure students' perception of learning and self-confidence gained by the simulation strategy. Wyrostok et al. did not provide any demographics of the learners or statistical findings from the measurement tools but did indicate that students rated themselves at a much higher level after the simulation.

R. Smith, Gray, Raymond, Catling-Paull, and Homer (2012) redesigned their midwifery course to include simulations to improve students' clinical skills and reflection practice. The authors evaluated the learners' ($N = 61$) perceptions of the new course design through several surveys, including a pre- and posttest of knowledge; a 6-week knowledge-retention test; and an online, 5-point Likert-type scale survey addressing the learner's satisfaction with the new course design. Although R. Smith et al. did not design their course around SLT, they did find student responses reflective of SLT, such as, "Everyone had a chance to practice," "Using the baby felt like it was a real birth," and "Small groups and lecture before the simulation session is really beneficial to learning and understanding." R. Smith et al. also observed significant improvement on the posttest from the pretest for both knowledge and 6-week knowledge retention ($p < .001$).

Outcomes

The most common simulation outcomes identified in the literature include knowledge and learning, performance, self-confidence, and satisfaction (Elfrink Cordi et al., 2012; O'Donnell et al., 2014; Swanson et al, 2011; A. Weaver, 2011; Wilson & Klein, 2012). The outcomes focused on in this study were undergraduate nursing students' perceptions of overall simulation effectiveness, learning, and self-confidence.

Overall Simulation Effectiveness

With the increasing popularity of using simulation in nursing education comes the need to evaluate effectiveness; however, current literature is limited in identifying simulation effectiveness. Laschinger et al.'s (2008) synthesis of the literature reviewed 23 articles from 1965–2004 to identify evidence to inform the effectiveness of simulation on prelicensure health-profession education. Laschinger et al. found conflicting evidence

on the effectiveness of simulation but did find higher learner satisfaction and short-term gains in knowledge and skills with simulation.

Similarly, Harder's (2010) systematic review identified gaps in the literature regarding evaluation of simulation effectiveness. Harder reviewed 23 articles between 2003 and 2007 and discovered literature supporting simulation as a teaching tool; however, only 39% of the articles reviewed reported an effect size.

Shin et al. (2015) conducted a meta-analysis of 20 studies from 1997–2013 to identify effects of simulation in nursing education. The 20 primary studies used in the analysis demonstrated heterogeneity ($Q = 140, p < .01$). Shin et al.'s findings indicated simulation education demonstrated medium to large effect sizes (.71), which supported simulation as a more effective learning method than traditional learning methods. Upon further subgroup analysis, Shin et al. reported the use of self-assessed simulation evaluation revealed a medium effect size (.59), simulation in foundation nursing courses demonstrated a lower to medium effect size (.49), and the use of high-fidelity simulators established a high effect size (0.81).

Learning

Simulation supports complex learning through active participation, feedback, student–faculty interaction, and collaboration (Jeffries, 2005). Kaakinen and Arwood (2009) recommended that for simulation to become a learning paradigm, a learning theory needs to be utilized for simulation design and evaluation. SLT was the chosen theory to support the design of the prebriefing phrase because of its support of learning through activities that promote collaboration between students and faculty.

In a meta-analysis, Brydges et al. (2015) reviewed the impact of self-regulated learning in simulation training. Brydges et al. described self-regulated learning as when a learner has developed a set of processes for managing the obtainment of learning goals. In their analysis of 32 studies from 1985–2011, Brydges et al. found interventions of self-regulated learning were insignificant ($p = .22$) compared to interventions without self-regulated learning. The authors recommended educators shift from utilizing self-regulated learning strategies to more of a shared responsibility between the learner and educators. This shift supports and prepares individuals for future learning (Brydges et al., 2015). This shared responsibility as described by Brydges et al. reflects that of SLT and its partnership between experienced mentor and novice learner (Lave & Wegner, 1991).

Two systematic reviews found the evaluation of learning during simulation is often measured by either self-report or pencil-and-paper testing using a defined tool (Foronda et al., 2013; O'Donnell et al., 2014). Foronda et al. (2013) reviewed 101 articles to synthesize the findings regarding the evaluation of simulation in undergraduate nursing education. Foronda et al. reported that 29 studies examined if simulation facilitated knowledge attainment, which was the most measured outcome in the review of the literature. The type of learning varied among the studies, including knowledge, psychomotor skills, reasoning, problem solving, and prioritization.

O'Donnell et al. (2014) reviewed 101 papers from 2005–2013. The authors found that despite the limited identification of the construct of learning, the results of studies reviewed were moderately robust in measuring knowledge. O'Donnell et al. recommended that future research report reliability and validity for measurement tools and identify extraneous variables that may affect the learning outcome.

The SET is a defined self-report tool used in the literature to measure perceived learning and self-confidence gained from a simulation. The first version of the tool was designed by more than 100 nurse experts from seven various nursing programs (Elfrink Cordi et al., 2012). The first designed tool had 20 items using a 5-point ordinal scale and was piloted on 161 participants from a single site. Based on findings from the first study, the tool was redesigned to 13 items using a 3-point ordinal scale and evaluated through a national study with 645 participants (Elfrink Cordi et al., 2012). The reliability of the revised tool had a Cronbach's alpha of .93.

The only other study where the SET was chosen for measurement was by Masters, Kane, and Pike (2014), who evaluated a tabletop psychiatric simulation comparing learning outcomes among accelerated baccalaureate nursing students ($n = 79$) to traditional baccalaureate nursing students ($n = 53$). Masters et al. did not find any significance between the two groups, and offered only a mean score range from 1.55 to 1.98, whereas the SET scale has a range of 0 (*do not agree*) to 2 (*strongly agree*). The SET may not be highly utilized in the nursing literature due to the overabundance of self-designed simulation tools or due to the tool's relative newness (2012) in the literature.

Self-Confidence

INASCL (2011) defined self-confidence as belief in oneself and one's abilities. Leigh (2008) performed a literature review on nursing student's confidence and simulation. Leigh described self-confidence as a process in which a nurse shifts focus from his or her needs to the patient's needs and as essential in becoming a safe practitioner. Leigh found that practicing skills led to increase self-confidence. Leigh

concluded simulation has been found to be an effective teaching method but more research is needed to analyze the extent to which confidence improves with simulation.

Simulations can foster learners with skills that can be transferred to practice, thus increasing one's self-confidence (Jeffries, 2005; Leigh, 2008; O'Donnell et al., 2014; Robb, 2012). O'Donnell et al. (2014) reported that self-confidence as a simulation learning outcome is well supported in the literature and is most often measured with pretest–posttest designs using Likert-type scales.

Thomas and Mackey (2012) studied 24 baccalaureate students' self-confidence in a pilot, quasi-experimental, pretest–posttest design. The experimental group included 14 students enrolled in an elective nursing simulation course; the control group was 10 students enrolled in a traditional nursing course. Thomas and Mackey used the Clinical Decision-Making Self-Confidence Scale, a 12-item Likert scale, at the beginning of the semester and again at the end. Results showed the simulation group was significantly more confident than the control group in recognizing patient decline ($p = .02$), performing basic assessment ($p = .02$), identifying nursing interventions ($p = .00$), and evaluating nursing interventions ($p = .00$).

Bambini et al. (2009) also conducted a quasi-experimental study with repeated measures regarding nursing students' ($N = 112$) self-confidence before and after a postpartum simulation. The authors used a self-designed, six-item, 10-point Likert-type tool that measured student self-confidence with newborn and postpartum nursing skills. Bambini et al. found that students experienced a significant increase in overall self-confidence ($p < .01$) following the simulations.

S. J. Smith and Roehers (2009) performed a correlation design study examining the effects of simulation experience on student satisfaction and self-confidence. The authors also correlated objectives, problem solving, guided reflection, and fidelity of the simulation experience with the study's outcomes. Each of the 68 baccalaureate nursing students participated in a standardized respiratory disorder simulation. The researchers utilized the NLN Student Satisfaction and Self-Confidence in Learning Scale and Simulation Design Scale after the simulation and debriefing. S. J. Smith and Roehers discovered that the overall mean of the satisfaction subscale (4.5 on a 5-point Likert scale) on the Student Satisfaction and Self-Confidence in Learning Scale suggested students were satisfied with the teaching method of simulation, and almost half of the variance (46.9%) was explained by the five design characteristics combined. The overall mean of the subscale score for self-confidence ($M = 4.2$) suggested students felt confident in their skills regarding taking care of a patient with a respiratory disorder, and again almost half of the variance (45%) was explained by the five design characteristics combined. The participants rated the guided reflection design feature the highest; however, upon further analysis, only the simulation design characteristics of objectives and problem solving were significant factors in a model predicting both learner satisfaction and self-confidence (S. J. Smith & Roehers, 2009).

This study used prebriefing activities designed to promote practice of nursing skills in a safe environment, thus facilitating participant self-confidence. This study also evaluated self-confidence using the SET, which uses a Likert-type scale to measure perceived gains in self-confidence.

Reflection

The concept of reflection can be traced back to the seminal work of Dewey in 1933 (Kuiper & Pesut, 2004). Reflection can be expressed using different terminology such as *self-awareness*, *reflective practice*, *reflective thinking*, *reflectivity*, *transformative learning*, and *critical reflection*. These terms are often described as equivalents to the term *reflection*.

Self-awareness is found to be similar to reflection because of its introspective process of linking thoughts, values, beliefs, feelings, events, and feedback, producing actions based on the awareness achieved from this process (Eckroth-Bucher, 2010). Reflective practice is when the act of reflection is demonstrated in practicing professionals (Mann, Gordon, & McLeod, 2009). Reflective thinking is similar to reflection in that it is an approach to learning and meaning making (Mann et al., 2009) and is the foundational activity that provides “perspective transformation” (Wang & King, 2006, ¶ 19).

Throughout most disciplines, reflection has been described as a process during which a person examines an experience (Burton & McNamara, 2009; Dirkx, 1998; Johns, 1995; Kolko, 2010; Scharp, 2008; Tsekeris, 2010). Many authors have portrayed reflection as a means to promote professional practice, offering new insight and comprehension of an issue or event at hand and then applying the gained knowledge towards the next experience (Dreifuerst, 2009; Fleming, 2007; Harvey, Coulson, Mackaway, & Winchester-Seeto, 2010; Hatlevik, 2008).

In the nursing literature, reflection commonly has been used as a learning tool to promote professional growth. Dekker-Goren, van der Schaaf, and Stokking (2011)

described reflection as an essential component for lifelong learning and development. Horton-Deutsch and Sherwood (2008) promoted reflection as a crucial skill for leadership development. Several other authors portrayed reflection as a means to promote professional practice (Dreifuerst, 2009; Fleming, 2007; Harvey et al., 2010; Hatlevik, 2008). The definition of reflection has had slight variance in the nursing literature. Taylor (2010) defined reflection as cognitive acts of sense making that can promote perspective changes. Ruth-Sahd (2003) explained reflection as a means of self-examination that involves reviewing events in practice in an attempt to enhance practice. Kuiper and Pesut (2004) described reflection as systematic evaluation of concerning issues related to a past experience. Fleming (2007) defined reflection as a way to produce new knowledge through critically contextualizing and evaluating specific issues in practice. Horton-Deutsch and Sherwood described reflection as systematically examining an experience from a broad perspective that encompasses rationality and feelings. Dekker-Goren et al. outlined reflection as a cognizant and thorough process of pondering and analyzing experiences, feelings, and available information to enhance understanding and learning. Bulman, Lathlean, and Gobbi (2012) illustrated reflection as a process of critical analysis of emotions and knowledge from practice experiences that leads to new perspectives about practice.

In essence, reflection is a mindful effort in analyzing an issue or event, including elicited feelings, for the purpose of learning and improving upon practice. The process of reflection has been identified as a key design strategy of the prebriefing phase (Onda, 2011) and debriefing phase of simulation (Dreifuerst, 2009; Onda, 2011) and may be influential in providing effective simulation outcomes.

Debriefing

INASCL (2011) defined debriefing as a facilitator-led activity that follows a simulation experience. INASCL recommended reflective thinking among participants and facilitator feedback on participant's performance. The purpose of debriefing is to transfer learning into future practice (INASCL, 2011). Debriefing is student centered, and faculty serve as facilitators guiding reflections on learners' thinking, actions, and emotions elicited during the scenario (Decker et al., 2013; Dreifuerst, 2009; Wickers, 2010).

In their review of the literature, Arafah et al. (2010) reported three phases to debriefing: the reaction phase, analysis phase, and summary phase. The reaction phase is for the participants to communicate their emotions and reactions towards the experienced scenario. During the analysis phase, learners explore learning gaps upon actions that occurred during the scenario. The summary phase serves as reinforcement for the scenario's learning objectives and take-away points to implement into future clinical practice (Arafah et al., 2010).

The use of open-ended questions during debriefing is the most common design feature (Arafah et al., 2010; Dreifuerst, 2009; Maryville, 2011; Wickers, 2010). Typical debriefing questions ask participants how they feel, how they prioritized their nursing care, what they based their decision on, what other possibilities are, and what other data would have been helpful (Wickers, 2010).

Debriefing has been described as the most influential element to student learning (Decker et al., 2013; Maryville, 2011; Shinnick et al., 2011). A phenomenological study investigated what specific elements facilitated learning through debriefing (Fey, Scrandis,

Daniels, & Haut, 2014). Fey et al. (2014) identified five themes through the interviews of 28 baccalaureate nursing student focus groups. The five themes that emerged as facilitating learning through debriefing were safe environment, exploring thoughts, receiving feedback from multiple perspectives, working together, and having group facilitation (Fey et al., 2014).

Shinnick et al. (2011) conducted a two-group, repeated-measure experimental design studying the impact of simulation alone and simulation plus debriefing on participants' ($N = 162$) clinical knowledge regarding heart failure. Shinnick et al. found that simulation with debriefing significantly increased knowledge scores ($p < .001$), thus supporting that learning takes place during the debriefing phase. Gordon and Buckley (2009) studied 50 medical-surgical graduate nurses' perceived ability and self-confidence after two 3-hour simulation workshops on resuscitation skills. The authors measured the perceptions on a self-designed, Likert-type, 14-item questionnaire immediately prior to the simulation and following debriefing. Participants reported significant increase in self-confidence of their skills ($p < .001$) and reported debriefing as the most beneficial aspect of simulation. However, Gordon and Buckley did not go into detail on how debriefing was conducted in the study.

Neill and Wotton's (2011) literature review revealed two distinct formats of debriefing sessions: structured or unstructured. An unstructured debriefing session is often without a guiding framework but rather guided by participants' discussions. A structured debriefing is preplanned with a strong focus on reflection and predetermined outcomes (Neill & Wotton 2011). INASCL (2011) recommended a structured format for debriefing to decrease negative fixations and repeating mistakes.

Lavoie, Pepin, and Boyer (2013) conducted a pilot test on reflective debriefing to promote novice nurses' clinical judgment after simulation. Via open-ended surveys, they asked five beginning nurses their perception regarding gained learning and satisfaction with reflective debriefing. Participants perceived that reflective debriefing assisted in their cognitive processes, such as how they reached a decision regarding the patient's situation (Lavoie et al., 2013).

Dreifuerst (2009) developed Structured Debriefing for Meaningful Learning, a tool promoting meaningful learning experiences in critical thinking, clinical reasoning and clinical judgment. The tool describes the process of engaging students in reflecting on decisions and actions during the simulation and how it will be applied to future practice (Dreifuerst, 2009).

Two studies were found that evaluated the effectiveness of structured debriefing, with conflicting results. Using the Health Science Reasoning Test, the Debriefing Assessment for Simulation in Healthcare Student Version, and the Debriefing for Meaningful Learning Supplemental Questions, Dreifuerst (2012) compared the usual and customary debriefing methods to structured debriefing for meaningful learning on 238 baccalaureate nursing students in a midwestern U.S. university. The findings indicated that the group exposed to structured debriefing had significantly higher critical reasoning scores ($p < .05$) and perceptions of receiving high-quality debriefing ($p < .05$). Mariani et al. (2013) also studied the impact of structured debriefing compared to customary debriefing on students' clinical judgment scores, using the Lasater Clinical Judgment Rubric. Unlike Dreifuerst (2012), Mariani et al. did not find any significant differences among the two groups of 86 baccalaureate nursing students; however, the focus-group

interviews revealed that students perceived structured debriefing assisted in more in their learning compared to the customary unstructured debriefing, which the participants felt highlighted their incorrect performance during the simulation.

Prebriefing

There is an identified gap in the nursing literature with the prebriefing phase of simulation. In 2011, INACSL defined prebriefing as an information session prior to the simulation scenario and suggested activities for prebriefing, such as orientation to the environment and review of objectives for the specific learning scenario. Despite INACSL's description of prebriefing, the nursing literature does not offer any standardized process of prebriefing, unlike its counterpart debriefing, thus leading many simulation programs either to omit prebriefing or to design their own process.

In the nursing literature the phenomenon of the before phase of nursing simulation has been cited with multiple labels: *prescenario* (Waxman, 2010), *presimulation* (Bruce et al., 2009; Davis Bye, 2011; Whitman & Backes, 2014), *preparation* (Brewer, 2011), *briefing* (Arafeh et al., 2010; Husebo et al., 2012; Miller, Riley, Davis, & Hansen, 2008; Titzer, Swenty, & Hoehn, 2012), *orientation* (Beattie et al., 2010), *preplanning sessions* (Elfrink et al., 2009), *reflection-before-action* (Onda, 2011), and *prebriefing* (Distelhorst & Wyss, 2013; Leighton, 2009; Mason & Lyons, 2013; Murphy, 2013; Sittner, Hertzog, & Ofe Fleck, 2013).

Similarly to the multiple name identifications of prebriefing, programs have used various prebriefing practices in the nursing literature. These various practices include the following:

1. Create a safe and trusting learning environment (Arafeh et al., 2010; Beattie et al., 2010; Miller et al., 2008; Murphy, 2013; Rudolph, Raemer, & Simon, 2014).
2. Identify simulation learning objectives for learners (Arafeh et al., 2010; Beattie et al., 2010; Brewer, 2011; Chunta & Edwards, 2013).
3. Review behavior expectations with learners such as respect and confidentiality (Arafeh et al., 2010; Brewer, 2011; Leighton, 2009).
4. Orient to the mannequin and equipment that will be used in the simulation (Beattie et al., 2010; Christian & Krumwiede, 2013; Chunta & Edwards, 2013; Hinchey, De Maio, Patel, & Cabañas, 2011; Leighton, 2009; Mason & Lyons, 2013; Miller et al., 2008, Murphy, 2013).
5. Complete preparation work such as reviewing knowledge and skills that will be used during the simulation (Brackney & Priode, 2015; Brewer, 2011; Distelhorst & Wyss, 2013; Leighton, 2009; Garret, MacPhee, & Jackson, 2010; Waxman, 2010).
6. Discuss the components of the debriefing following the simulation with the learners (Arafeh et al., 2010; Chunta & Edwards, 2013).
7. Discuss with the learners the need for suspension of disbelief (Mason & Lyons, 2013; Miller et al., 2008).
8. Discuss and identify with the learners the roles they will assume during the scenario (Chunta & Edwards, 2013; Miller et al., 2008).

The majority of the articles examined to define prebriefing were descriptive in nature. Only a few research studies identified the prebriefing phase under the methods

section. For example, Waxman (2010) offered guidelines for nurse educators in developing evidence-based simulation scenarios. Waxman's reference to prebriefing was identified as *prescenario* learner activities, which included listing knowledge and skills needed before the simulation. Hermanns, Lilly, and Crawley (2011) similarly identified prebriefing in their methods section as a time to review with learners the major components of the simulation scenario.

Bruce et al. (2009) identified prebriefing as *presimulation* in the methods section of their evaluation study of HFS, which included classroom and lab education and mannequin orientation regarding the knowledge and skills of the upcoming simulation of crisis management. Whitman and Backes (2014) also identified prebriefing as *presimulation* in their article regarding guidelines in role direction. Whitman and Backes described this phase as reviewing assignments related to concepts of the simulation, tasks that may be used during simulation, and roles for the upcoming simulation.

Arafeh et al. (2010) discussed how to facilitate a reflective discussion in debriefing. In their description, the authors identified prebriefing as *briefing*, including discussion of the value of simulation and components of debriefing, setting ground rules for open communication, providing overview of the concepts the learner will encounter during the simulation, and providing a safe learning environment. Husebo et al. (2012) also identified prebriefing as *briefing* in their analytical study examining 11 videotapes of learners' demonstration of resuscitation skills during prebriefing. The findings demonstrated despite prebriefing on resuscitation skills, learners were still challenged in performing the skills correctly during the scenario, thus suggesting that prebriefing can

help the facilitator monitor students' comprehension of skill and knowledge (Husebo et al., 2012).

Miller et al. (2008) also identified prebriefing as *briefing*. In their descriptive article of components of *in situ* simulation, briefing was identified as a key component to share the purpose of the simulation, mannequin orientation, and ground rules to establish trust. Titzer et al. (2012) also identified prebriefing as *briefing* in their descriptive article discussing the promotion of interprofessional simulation. Titzer et al. described the briefing phase as a time when learning objectives, debriefing, and orientation are discussed.

Beattie et al. (2010) identified prebriefing as *orientation* in their descriptive article on how to design a simulation to promote clinical inquiry. Beattie et al. described the orientation phase as an important element for a successful simulation. This phase can decrease learner fear and enhance self-confidence by the facilitator promoting a trusting learning environment and providing learning objectives for learners to identify and prepare for their learning needs (Beattie et al., 2010). Sittner et al. (2013) also described prebriefing as *orientation* in the procedures section of their research regarding the learner experience of a labor and delivery simulation. The orientation phase was identified as the process where learners were given a review sheet of specific content and skills to review prior to the simulation.

Distelhorst and Wyss (2013) used the term *prebriefing* in their descriptive article discussing simulation in community health nursing. Their components of prebriefing included learner preparation via reading assignments. Mason and Lyons (2013) also used the term *prebriefing* in their descriptive article describing a multidisciplinary simulation

educational strategy. Mason and Lyons described this phase as a time to set the stage for the scenario, including orientation to the mannequin and equipment. Murphy (2013) identified prebriefing in a similar way to Mason and Lyons in her descriptive article on how to transform a simulation center.

Maynes (2008) identified prebriefing in her descriptive article as a venue to set the simulation scene, structured as a nursing change or shift report. She also described prebriefing as a time to identify roles and for learners to begin reviewing the simulated patient's history and asking questions. Eggenberger and Regan (2010) identified prebriefing as first phase of simulation design in their descriptive article discussing the use of simulation to teach family nursing. Eggenberger and Regan's description was similar to that of Maynes in that the first phase was aimed to promote student engagement of reviewing and evaluating simulation patient data. Eggenberger and Regan also had learners complete a clinical reasoning worksheet with peers as a team.

Nursing shift report has been described as an opportunity that supports socialization into the nursing role (Skaalvik, Normann, & Henriksen, 2010; Wolf, 1989; Yurkovich & Smyer, 1998). Shift report enables nurse to plan their work day by the set of assumptions and facts about patients received and to constantly compare what was reported to what was found during their work day (Wolf, 1989). This socialization process of nursing shift report correlates with SLT in that knowledge and skill development requires the learner to fully participate in the practices of the setting (Lave & Wenger, 1991).

In exploration and thus summation of the literature, prebriefing is an educator-designed phase of simulation that is implemented at a designated time prior to the hands-

on scenario and includes both orientation tasks and learning-engagement activities to enhance learner satisfaction, participation, and effectiveness of the simulation experience (Chamberlain, 2015). Orientation activities include the acclimation or review of simulation equipment such as the mannequin and scenario supplies; behavioral expectations, such as suspension of disbelief and roles during the scenario; and the identification of learning and debriefing objectives. Learning-engagement activities include preparation assignments involving cognitive or psychomotor domains, scenario discussion and reflection related to the application of nursing process, and creation of a safe and trusting learning environment.

Reflection is essential in the prebriefing phase. Learners need to reflect on actions that will be expected of them, which encompass planning and reviewing resources in anticipation of what may transpire during the simulation (Onda, 2011). Onda (2011) further stated that reflection is the seed of clinical reasoning and should center every part of the nursing process including planning, which is represented in simulation as the prebriefing phase.

Prebriefing Research

Research is limited in identifying the value of prebriefing; the only study identified that focused on prebriefing was that of Elfrink et al. (2009). Elfrink et al. (2009) conducted evaluation research on ways to improve the simulation learning experience of their nursing students; however, the authors did not include in their methods how the simulation was conducted. The authors asked the learners to identify the strengths and weaknesses of the simulation experience and discovered that some students felt their learning was hindered by not knowing where to start or what to do,

despite being informed of their roles and flow of the simulation. Following the summative evaluations, Elfrink et al. (2009) developed a survey that asked the students to rate simulation elements' helpfulness from 0 (*not helpful at all*) to 2 (*very helpful*). The students ($N = 114$) identified most frequently that the preplanning sessions (34%) were most helpful to the simulation learning experience compared to debriefing (19%). Elfrink et al. (2009) similarly discovered no literature describing the benefits of group planning prior to simulation.

Elfrink et al.'s (2009) findings were reflected in the literature review by Page-Cutrara (2014). Page-Cutrara performed a literature search from 2003–2014 and discovered only 15 articles related to prebriefing. Of those, only one specifically focused on prebriefing in its title, and seven articles included the prebriefing phase in the abstract. Page-Cutrara also found no standardization in terminology or process of prebriefing, thus supporting the need to rigorously research the prebriefing phase of simulation.

Kelly, Hager, and Gallagher (2014) conducted a descriptive study on students' ratings of simulation components that contributed to clinical judgment. Kelly et al.'s survey was an 11-item self-designed tool from the review of literature and based on Tanner's clinical judgment model. The 5-point rating scale survey was given to 102 nursing students at the end of a nursing course that incorporated simulations throughout. Out of the 11 simulation components asked, students ranked briefing and orientation to the simulation area as ninth. Students ranked facilitated debriefing as the most beneficial to clinical judgment. However, Kelly et al. did not describe any of the 11 simulation components.

Cordeau (2012) conducted grounded theory research using high-stakes clinical simulation for 30 students in a Bachelor of Science in Nursing (BSN) program. Cordeau discovered a four-stage process of learners using simulation to teach caring as a professional nurse. She described the four stages as sim-hype, encountering barriers, integrating-the-self, and interconnecting. Cordeau described Stage 1 or sim-hype as the time where students collectively discuss related simulation experiences, discuss anxieties for the upcoming scenario, and plan for upcoming possibilities in scenario. Cordeau emphasized that although planning for the scenario is useful and valuable, learners must be informed that the scenario might not go as planned. Cordeau also included the common prebriefing objectives for Stage 1, such as orientation to the simulator, review of scenario objectives, and skills needed for the simulation. Cordeau stated this phase is important for the learners to assign significance to the simulation in that the mannequin is an actual patient and the scenario has value for learning. Cordeau stated that this stage allows for learners to connect with each other; students must be supported during this stage to decrease anxiety, assign signification, and promote a learning community. Cordeau's description of promoting a learning community aligned with the concepts of SLT and its support of a learning community (Lave & Wenger, 1991).

It is a disputable point whether to acknowledge the results of simulation research given the fact that not all three phases of simulation are standardized among educational programs. This concern drives the need not only to recommend a standard process of prebriefing but also to identify its value in terms of the effectiveness and outcomes of simulation.

Chapter Summary

Limited research information is available regarding prebriefing compared to debriefing. SLT was found to be reflective in the pedagogy of simulation through its foundational beliefs that learning is a social process enhanced by the authentic environment. Teamwork and team briefings have been identified in the literature as an essential element for healthcare practice for patient safety. These practices can be paralleled to the prebriefing phase of simulation. Similarly, reflection has been supported as a key feature in the debriefing design and is also important in the prebriefing phase. Simulation outcomes of students' perceptions of overall simulation effectiveness, self-confidence, and learning have been identified throughout the literature as the most commonly measured simulation variables, and those were utilized in this study.

Current nursing literature has demonstrated a gap regarding the prebriefing phase of simulation. The study's findings are essential to provide faculty with the best evidence for designing effective simulation. Simulation is commonly used in undergraduate nursing programs to promote practice readiness. The next chapter describes the study design.

Chapter 3

Methods

There is an identified gap in the nursing literature regarding prebriefing and its value to the simulation process. This study examined prebriefing and undergraduate nursing students' perception of overall simulation effectiveness. The findings of this study may assist nursing faculty in matching specific prebriefing strategies with learner needs, thus increasing the effectiveness of simulation and promoting practice readiness.

Research Design

This study used a descriptive, quasi-experimental, posttest-only design. The posttest-only design was chosen for its ability to confound any effects a pretest might have on students' knowledge and performance during the simulation, thus influencing the outcomes of the study. There were four groups at each selected study site: Group A served as the comparison group and did not have prebriefing, Group B served as the experimental group and experienced prebriefing learning-engagement and orientation activities, Group C experienced only orientation activities of prebriefing, and Group D experienced only learner-engagement activities of prebriefing.

A concern to the design was history threat due to lack of a pretest to control for undue influence of prior knowledge and skill. The outcomes regarding perceptions of overall simulation effectiveness, learning, and self-confidence were not relevant until after the intervention of prebriefing was completed, thus not permitting an evaluation beforehand.

Research Assumptions

The study assumed the following statements to be true.

1. The SET is a valid and reliable tool that measures student perception of learning and self-confidence obtained from a simulated clinical experience. This tool was tested on over 800 nursing students in a multisite, national study with a calculated Cronbach's alpha of .93 (Elfrink Cordi et al., 2012).
2. Students reported honestly. The study tool did not ask for name identification.
3. Students' prior knowledge regarding the context of simulation scenario was equivalent. Participants were of matching educational backgrounds, in the second semester of their junior year of a baccalaureate curriculum. The researcher validated with faculty at each selected site that students had received content regarding respiratory care.
4. Simulation settings provided similar simulation experiences. Selection sites utilized HFS for clinical simulation in a realistic setting to ensure the element of realism was present.

Setting

The study took place in downstate Illinois. The colleges of nursing that were the setting of the study were selected based on their well-established, fully accredited program and experienced simulation program.

Millikin University is located in Decatur and was founded over 100 years ago. Students entering the School of Nursing may earn a BSN, an accelerated BSN, BSN completion degree, Master of Science in Nursing degree, or Doctor of Nursing Practice degree. Millikin is accredited by the Commission on Collegiate Nursing Education and the Higher Learning Commission of the North Central Association. The selected nursing

program is approved by the Illinois Department of Professional Regulation and the Illinois Board of Higher Education and accepts 60 students in each nursing class.

St. John's College is located in Springfield and was founded over 125 years ago. Students entering the School of Nursing may earn a BSN, an accelerated BSN, or a BSN completion degree. St. John's College is accredited by the Accreditation Commission for Education in Nursing and the Higher Learning Commission of the North Central Association. The selected nursing program is approved by the Illinois Department of Professional Regulation and the Illinois Board of Higher Education and accepts 60 students in each nursing class.

Sampling Plan

Sampling Strategy

The population of the study was American BSN and accelerated BSN students. The accessible population comprised from a nonprobability convenience sampling of BSN students from the selected and agreeable sites. The sampling design was chosen due to practical constraints of the researcher, such as limited travel abilities, and convenience, such as preassigned student groups according to clinical assignments.

Concerns regarding convenience sampling included sampling bias and thus limited ability to generalize findings to a broader population (Polit & Beck, 2012). However, the study includes a description of demographic data to demonstrate group equivalence, multiple sites to increase representativeness of population, and randomization of the intervention.

Eligibility Criteria

Inclusion criteria. Participants of the proposed study were eligible if enrolled as a nursing student at one of the selected sites. The participant must have been able to read and comprehend English, be 18 years of age or older, and received respiratory distress content in the curriculum.

Exclusion criteria. Exclusion criteria included students who were not an enrolled nursing student at the selected site; were under the age of 18; could not read or understand the English language; or, according to a faculty member, had not received respiratory distress content in the curriculum, which might have caused the student undue frustration, stress, and anxiety while participating in the simulation. No participants were excluded from the study.

Determination of Sample Size

Power analysis was completed via a priori Sample Size Calculator (Soper, 2015). The researcher was interested in only a one-directional relationship among the variables. The prebriefing intervention was hypothesized to increase students' perception of gained learning and self-confidence, and thus a one-tailed test was used for testing statistical significance. Type I error, rejecting the true hypothesis that participants would significantly value prebriefing in regards to its influence on learning, self-confidence, and simulation effectiveness, was set at .05. The power of the test, or likelihood that the analysis will identify a true significance, was set at .80.

The mean effect size was unknown, as prebriefing research is an identified gap in the literature; however, Shin et al. (2015) conducted a meta-analysis of 20 studies from 1997–2013 to identify effects of simulation in nursing education. Shin et al.'s findings

indicated that simulation education demonstrated medium to large effect sizes (.71), self-assessed simulation evaluation revealed a medium effect size (.59), foundation of nursing revealed a lower to medium effect size (.49), and HFS showed a high effect size (.81). The study included self-assessed evaluation, the use of a high-fidelity simulator, with participants from a foundation course. These elements were combined to project the study's effect size as medium-large effect (.65).

The known mean of the SET is 19 with a standard deviation of 5.2. However, Item 13 of the tool was revised in the current study because it was related to debriefing rather than prebriefing. The authors of the tool, Elfrink Cordi et al. (2012), provided a table that demonstrated scale variance if an item was deleted. If Item 13, "Debriefing and group discussion were valuable," were deleted, the Cronbach's alpha would remain at .92 (Elfrink Cordi et al., 2012), thus calculating a recommended sample of 120 participants or 30 participants per group.

Protection of Human Subjects

The study was educational research, which often does not qualify as human-subject research. Exempt status from the Institutional Review Board (IRB) of Nova Southeastern University and Millikin University (Appendix A) was sought and obtained. St. John's College only required the researcher's educational institution IRB to be reviewed (Appendix A). Informed consent process of the participants was waived due to the exempt determination by the IRB office, since the research is focused on education instructional strategies. An informational sheet about the study was presented to the participants before the study took place.

Risks of participation. Subjects did not incur increased risk of harm from their research involvement of the study, beyond the normal risks inherent in everyday life of their nursing program and simulation lab. Participation in the simulation was a course experience; however, no grades were assigned to the experience. The study's intervention involved social interaction among participants in the form of discussions and learning activities, a common teaching strategy in nursing programs. Participants worked collaboratively, and no one student was called upon for individual answers, to eliminate fears and anxiety of evaluation. Participants participated in the intervention as little or as much as they felt comfortable with. Participants were reminded that no names were required on the surveys, thereby keeping their responses anonymous.

Benefits of participation. There was no compensation for participation in the study. Potential benefits for participants included increased learning and self-confidence regarding taking care of a respiratory distress client and being exposed to the nursing research process as a student nurse, a professional nursing role expectation.

Data storage. The study's data to be protected include completed demographic surveys and SETs by participants. Paper data are stored in a locked cabinet at the researcher's home office. Data transferred to a software program are stored on the researcher's private password-secured desktop. Data will be stored for 3 years as required by Nova Southeastern University's IRB.

Procedures

The researcher contacted each simulation program's coordinator to confirm date and time for study activities. Participants were pregrouped by faculty at the selected colleges of nursing sites, as it is customary to conduct HFS labs in clinical nursing

groups. The researcher prerandomized the groups for time efficiency purposes. On the confirmed study date, the researcher discussed the study's details, including objectives, protocol, and eligibility requirements to all potential participants, and then proceeded accordingly to the predetermined protocol for the group (Appendix B). The prerandomized groups, which occurred at each college, were the following: Group A, the comparison group, received no prebriefing; Group B, an experimental group, received prebriefing learning-engagement and orientation activities; Group C, an experimental group, received prebriefing orientation activities only; and Group D, an experimental group, received prebriefing learning-engagement activities only. As one group was in the simulation lab, the other groups were in another room doing assigned activities not related to the context of the study's scenario to minimize internal threats to the study such as intervention contamination; not following intervention protocol (Polit & Beck, 2012); or compensatory rivalry, where participants in the control group feel they are being devalued (Creswell, 2014). To minimize intervention infidelity or flaws in implementation of the intervention, the researcher conducted all prebriefing interventions (Polit & Beck, 2012).

Due to the posttest-only design of the study, Group A (no prebriefing) began the simulation scenario upon entering the room. The simulation scenario, which can be found in Appendix C, was a standard respiratory distress scenario conducted with all groups. After the completion of the simulation scenario, the SET (Appendix D) was then immediately administered and completed by the participants. It was essential that the SET be completed prior to any debriefing to eliminate any internal study threats. The SET had a demographic survey (Appendix E) attached to measure equivalency among

groups (Polit & Beck, 2012). After completion of the SET, the participants exited the study activities.

Group B (prebriefing learning-engagement and orientation activities) began with a 20-minute prebriefing session. Prebriefing included orientation activities of identifying simulation learning objectives and scenario roles (Appendix C) for the participants and review of the mannequin and equipment used in simulation. The orientation activities took 5–7 minutes. Prebriefing also included learning-engagement activities that meet the needs of visual, auditory, and kinesthetic learners. Learning-engagement activities began with a viewing of a 4-minute respiratory assessment video, followed by completion of a respiratory worksheet, and ending with group discussion regarding plans of care for respiratory distress clients. During this time, the researcher created a safe and trusting learning environment by ensuring students that this was a practice environment where it was safe to ask questions and practice their newly acquired skills without being reprimanded or graded on simulation performance. The learning-engagement activities took 13–15 minutes to complete. After prebriefing was completed, the standard respiratory distress scenario was conducted. Immediately following the scenario, the participants completed the SET. After completion of the SET, the participants exited the study activities.

Group C (prebriefing orientation activities only) began with a 5- to 7-minute prebriefing session. Orientation activities were the same as Group B's orientation activities. After prebriefing was completed, the standard respiratory distress scenario was conducted. Immediately following the scenario, the participants completed the SET. After completion of the SET, the participants exited the study protocol.

Group D (prebriefing learning-engagement activities only) began with a 13- to 15-minute prebriefing session. Learning-engagement activities were the same as Group B's learning-engagement activities. After prebriefing was completed, the standard respiratory distress scenario was conducted. Immediately following the scenario, the participants completed the SET. After completion of the SET, the participants exited the study activities.

Instrumentation

The SET. The SET was designed from five simulation-evaluation tools from colleges of nursing that participated in the Program for Nursing Curriculum Integration developed by Medical Education Technologies, Incorporated (Elfrink Cordi et al., 2012) and from an additional nursing program's simulation evaluation tool that did not partake in the Program for Nursing Curriculum Integration. The six tools had not been evaluated for reliability or validity; however, these tools were felt to best represent the concepts of learning, self-confidence, and satisfaction, which have been identified as essential in evaluating simulation experience effectiveness. Permission from Medical Education Technologies, Incorporated was obtained to revise the initial tool and then to test for validity and reliability (Elfrink Cordi et al., 2012).

The first version of the tool contained 20 items on a 5-point Likert-type scale and was piloted on 161 participants from a single site. The results demonstrated the tool's reliability but also identified problem areas, such as low item-total correlations, reverse scoring, and redundancy. These problems were addressed in the tool's revision. The 2012 revision of the tool includes 13 items (Elfrink Cordi et al., 2012). The revised tool was tested on 645 participants from multiple sites.

Additionally, Elfrink Cordi et al. (2012) felt the 5-point Likert scale (*strongly disagree, disagree, undecided, agree, and strongly agree*) was not discriminating opinions clearly and wanted to force the participants to choice between effective and not effective. Analysis did not identify any significant difference in the reliability of revising the 5-point Likert scale to a 3-point Likert scale (*do not agree, somewhat agree, and strongly agree*), so the revision of the tool includes the 3-point Likert scale (Elfrink Cordi et al., 2012).

The original tool's factor analysis revealed four factors—simulation effectiveness, self-confidence, learning, and attitudes—with no meaningful subscales present. However, the revised 13-item tool's factor analysis identified two significant subscales: learning (eight items) and self-confidence (five items). The subscale of learning includes eight statements (Elfrink Cordi et al., 2012, p. e206):

- Item 1: The instructor's questions helped me to think critically.
- Item 3: I developed a better understanding of the pathophysiology of the conditions in the simulated clinical experience.
- Item 4: I developed a better understanding of the medications that were in the simulated clinical experience.
- Item 7: My assessment skills improved.
- Item 10: Completing the simulated clinical experience helped me understand classroom information better.
- Item 11: I was challenged in my thinking and decision-making skills.
- Item 12: I learned as much from observing my peers as I did when I was actively involved in caring for the simulated patient.

- Item 13: Debriefing and group discussion were valuable.

The subscale of self-confidence includes five statements (Elfrink Cordi et al., 2012, p. e206):

- Item 2: I feel better prepared to care for real patients.
- Item 5: I feel more confident in my decision-making skills.
- Item 6: I am more confident in determining what to tell the healthcare provider.
- Item 8: I feel more confident that I will be able to recognize changes in my real patient's condition.
- Item 9: I am able to better predict what changes may occur with my real patients.

Validity. Construct validation of the tool was conducted through discussions among original creators of the tools and the simulation faculty at Ohio State University. The discussions led to the decision to focus the tool on learning and self-confidence and to delete items connected to attitudes (Elfrink Cordi et al., 2012).

Reliability. Internal reliability of the SET was identified with a Cronbach's alpha of .93. Item analysis demonstrated little difference in the items' contribution to overall score. The self-confidence subscale's calculated reliability is .88, and the learning subscale's calculated reliability is .87. The study's findings also demonstrated a high total correlation among the 13 items with the overall factor of simulation effectiveness (Elfrink Cordi et al., 2012). The study's findings signified that the SET meets the customary acceptable criterion (Cronbach's alpha of .80) for reliability (Polit & Beck, 2012). Several researchers have used the SET but not reported internal reliability of the

tool (Borjan, Balogh, & Meszaros, 2013; Hammer, Fox, & DeCoux Hampton, 2014; Masters et al., 2014; Pope, Gore, & Renfroe, 2013; Zhang, Ura, & Kaplan, 2014).

Scoring. The 13-item tool is based on a 3-point Likert-type scale of 0 (*do not agree*), 1 (*somewhat agree*), and 2 (*strongly agree*). Potentially, participants' total scale scores can range from 0–26. A higher score equates to the higher perception of overall simulation effectiveness. Evaluation of the psychometric characteristics of the tool revealed the total scale scores of minimum 3, maximum 26, mean 19, and standard deviation of 5.2. Item scores ranged from 1.20 to 1.83, with a mean of 1.46 and a standard deviation of 0.18 (Elfrink Cordi et al., 2012).

General Statistical Strategy

Data Cleaning

The data set was small, therefore missing data would have reduced power and case-wise deletion was not performed. Each survey returned was checked for completeness. Fewer than 10 surveys were deemed incomplete. The incomplete data were all found in the Likert-scale portion of the survey. There was no pattern to the missing data, and each survey had only one or two items out of the 13-item survey not marked. These items were then scored as “not applicable,” which was a choice on the survey so did not alter the overall score of the tool.

Descriptives

Descriptive statistics were used to report frequency and mean for participants' gender, age, race, hospital work experience status, and simulation experiences to determine homogenous of groups. Central tendencies including range, median, and standard deviation of the 13 SET items were also analyzed and reported.

Reliability Testing

The SET's internal reliability for this study was measured at Cronbach's alpha of .902. This results was comparable to Elfrink Cordi et al.'s (2012) previously measured internal reliability of .93.

Hypotheses Testing

The null hypotheses of the study were accepted or rejected by the parametric procedure of analysis of variance (ANOVA) with the significance level identified at $p < .05$. The null hypotheses were that the simulation would be equally effective among all four groups, based on SET scores.

Specifically, $H1_0$ was that there would be no significant difference between undergraduate nursing students' perceptions of overall simulation effectiveness with the use of prebriefing orientation and learning-engagement activities compared to no prebriefing. $H2_0$ was that there would be no significant difference between undergraduate nursing students' perceptions of learning with the use of prebriefing orientation and learning-engagement activities compared to no prebriefing. $H3_0$ was that there would be no significant difference between undergraduate nursing students' perceptions of self-confidence with the use of prebriefing orientation and learning-engagement activities compared to no prebriefing. $H4_0$ was that there would be no significant difference between undergraduate nursing students' perceptions of overall simulation effectiveness with the use of prebriefing learning-engagement activities only compared to prebriefing orientation activities only. $H5_0$ was that there would be no significant difference between undergraduate nursing students' perceptions of overall learning with the use of prebriefing learning-engagement activities only compared to

prebriefing orientation activities only. H₀ was that there would be no significant difference between undergraduate nursing students' perceptions of self-confidence with the use of prebriefing learning-engagement activities only compared to prebriefing orientation activities only.

Limitations

Threats to Internal Validity

An internal threat to the study included history threat, such as if the chosen site provided students increased educational strategies that incorporated teamwork and collaboration or extensive care planning for the respiratory client (the simulation scenario). This concurrent intervention could have skewed knowledge and performance during simulation and thus influenced outcomes of the study; however, no observations were made during the study that would support this possible threat. It was assumed that if these external interventions were in place, they likely would have affected all study groups, and group differences would represent effects above these external factors (Polit & Beck, 2012).

Selection threat was another concern due to the lack of randomization of participants in groups. Simulation programs in undergraduate nursing schools often provide scenarios in groups, such as preassigned clinical groups, in order to enhance resource utilization and the student learning experience. These customary groups (clinical groups) established by the nursing program served as the study's group. In order to minimize selection threat, each clinical group was randomly assigned to either the experimental or comparison group.

Another internal threat included instrumentation. The researcher altered the last item on the SET because it related to debriefing. The item was revised to read “Prebriefing and group discussion were valuable.” However, the authors of the tool determined if Item 13, “Debriefing and group discussion were valuable,” were deleted, Cronbach’s alpha remained at .92 (Elfrink Cordi et al., 2012).

Threats to External Validity

Threats to external validity included concerns about the extent to which the study results can be generalizable. The researcher enhanced the external validity by ensuring adequate sample size was obtained to demonstrate significance and that subject and site selection was representative of current nursing programs. The power analysis recommended 120 participants or 30 per group. The study included 119 participants: Group A (no prebriefing) $n = 29$, Group B (prebriefing of learning-engagement and orientation tasks) $n = 29$, Group C (prebriefing of orientation only) $n = 32$, and Group D (prebriefing of learning-engagement activities only) $n = 28$.

Chapter Summary

A descriptive, quasi-experimental, posttest-only design was conducted to determine if there was a significant difference in participants’ perceptions of overall simulation effectiveness, learning, and self-confidence among four groups: Group A (no prebriefing), Group B (prebriefing learning-engagement and orientation activities), Group C (prebriefing orientation activities only), and Group D (prebriefing learning-engagement activities only). These study findings not only demonstrate the importance of prebriefing but also identify which prebriefing practices are perceived as the most effective by undergraduate nursing students.

Chapter 4

Results

Little is known about prebriefing and its value to the simulation process. The purpose of this study was to examine undergraduate nursing students' perception of prebriefing and its overall simulation effectiveness. The quasi-experimental, posttest-only design examined four groups: no prebriefing, prebriefing learning-engagement and orientation activities, prebriefing orientation activities only, and prebriefing learning-engagement activities only.

There were 119 subjects approached to participate in the study (55 at St. John's College and 64 at Millikin) during a scheduled lab day. After the study's informational letter was read, it was reemphasized to the participants if they did not wish to participate, they could just observe and turn in a blank survey. No students declined to participate in the study, for all returned surveys were completed, thus making the return rate 100%.

Data Cleaning

Each survey returned ($N = 119$) was checked for completeness. Fewer than 10 surveys were deemed incomplete, which were found during entry of participants' responses from survey into the SPSS software. There was no pattern to the missing data, for each survey had only one or two items missing, which were all located on the 13-item survey. A few participants did not mark a response to an item. These items were then scored and entered as "not applicable," which was already a formal choice on the survey. This method was chosen because "not applicable" choices did not alter the overall survey scores. All 119 surveys were then used in the data analysis. The survey included all ordinal data choices, so there were no outliers to manage.

Descriptives

Description of the Sample

The sample at St. John's College of Nursing consisted of 55 participants, with 78% female and 22% male. The majority of the participants (47%) were traditional college-age students from 18–22, and 40% were ages 23–30. The sample was 87% White, 9% Black, and 4% Asian. Over half of the sample (55%) reported no healthcare work experience, and 73% stated they had not had any simulation experience either (see Table 1).

The sample from Millikin's College of Nursing was compared to St. John's College of Nursing. The sample at Millikin's College of Nursing consisted of 64 participants, 84% female. The majority of the participants (83%) were traditional college-age students from 18–22. Ethnicity is shown in Table 1. Over half of the sample (55%) reported no healthcare work experience, and 58% stated they had not had any simulation experience either.

Combining the two samples, the overall sample consisted of 119 participants. The cumulative demographics are demonstrated in Table 1. The overall sample was 82% female. The majority of the participants (66%) were traditional college-age students of 18–22, 26% were ages 23–30, and 8% were above 31 years of age. Over half of the sample (55%) reported no healthcare work experience, and 65% stated they had not had any simulation experience either. The sample was 77% White, 16% Black, 4% Asian, and 3% Hispanic. These demographics reflect the population of student nurses among baccalaureate programs: 67% White, 12% Black, 8% Asian, 6% Hispanic, 16% over age 30, and 14% male students (NLN, 2015).

Table 1

Sample Description

Demographic	SJC	MU	Total	Pearson chi-square	
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>df</i>	<i>p</i>
Total	55	64	119		
Gender				3	.706
Female	43 (78%)	54 (84%)	97 (82%)		
Male	12 (22%)	10 (16%)	22 (18%)		
Age				6	.798
18–22	26 (47%)	53 (83%)	79 (66%)		
23–30	22 (40%)	9 (14%)	31 (26%)		
31–49	7(13%)	2 (3%)	9 (8%)		
Ethnicity				9	.376
White	48 (87%)	43 (68%)	91 (77%)		
Black	5 (9%)	14 (22%)	19 (16%)		
Asian	2 (4%)	3 (5%)	5 (4%)		
Hispanic	0 (0%)	3 (5%)	3 (3%)		
Healthcare work experience				3	.469
Work experience	25 (45%)	35 (55%)	60 (55%)		
None	30 (55%)	29 (45%)	59 (45%)		
Simulation experience				6	.471
None	40 (73%)	37 (58%)	77 (65%)		
Very little	12 (22%)	22 (34%)	34 (29%)		
Some	3 (5%)	5 (8%)	8 (6%)		

Note. MU = Millikin University; SJC = St. Johns College.

The intervention groups were clinical groups predetermined by the colleges of nursing; however, interventions were randomly assigned to the clinical group. The Pearson's chi-square goodness-of-fit test failed to reject the null hypothesis that the data by gender ($p = .706$), race ($p = .376$), work experience ($p = .469$), and simulation

experience ($p = .471$) were not normally distributed among the intervention groups (see Table 1). Thus, all intervention groups were considered normally distributed.

Responses to the Measurements

The 13-item SET is based on a 3-point Likert-type scale with 0 representing *do not agree*, 1 representing *somewhat agree*, and 2 representing *strongly agree*. Elfrink Cordi et al. (2012) reported item scores ranged from 1.20 to 1.83 with a mean of 1.46 and a standard deviation of 0.18. Since the study was testing four different interventions, the overall item score ranges for the 119 surveys would not be applicable to compare to the original study. Means and standard deviations for specific items on the SET are presented in Appendix F. Table 2 displays each group's mean for the combined scales of learning, confidence and overall simulation effectiveness. According to Elfrink Cordi et al., a higher score equates to the higher perception of overall simulation effectiveness. In review, the learning score range is 0–16, the confidence score range is 0–10, and the overall simulation effectiveness score can range from 0–26 (Elfrink Cordi et al, 2012). Group A, n prebriefing, had lower scores on each scale than the three experimental groups (see Table 2).

Table 2

Scale Scores by Intervention Group on the Simulation Effectiveness Tool

Scale	Group A: no prebrief <i>M (SD)</i>	Group B: learning engagement & orientation <i>M (SD)</i>	Group C: orientation <i>M (SD)</i>	Group D: learning engagement <i>M (SD)</i>
Confidence	4.11 (3.05)	6.95 (2.25)	5.86 (2.52)	6.55 (2.06)
Learning	8.22 (3.77)	12.29 (2.61)	11.10 (3.25)	12.32 (2.66)
Overall simulation effectiveness	12.33 (6.51)	19.19 (4.33)	16.90 (5.82)	18.86 (4.97)

Note. Confidence score range is 0–10, learning range is 0–16, and overall simulation effectiveness score range is 0–26, with higher scores showing better perceptions. Group A $n = 29$, Group B $n = 29$, Group C $n = 32$, and Group D $n = 28$. $df = 3$ for all scales.

The majority of the 13 items on the survey also demonstrated significance among the intervention groups (see Appendix F). Post hoc analysis was performed to identify which specific groups were significant (see Appendix G). Findings demonstrated significant differences in participant perceptions between Group A, no prebriefing, and the other groups. However, there were no differences among which element of prebriefing (learning-engagement activities or orientation tasks) was most valued by participants, thus leading to the assumption that both learning-engagement activities and orientation tasks were valued equally in prebriefing. Table 3 presents the significant differences found by SET item and scale.

Table 3

Post Hoc Scheffe Analysis: Statistically Significant Differences in Mean Scores on the Simulation Effectiveness Tool, Compared to Group A (No Prebriefing)

Item	Group B (both prebriefing activities)	Group C (orientation only)	Group D (learning engagement only)
1. The instructor's questions helped me to think critically.	.000***	.001**	.000***
2. I feel better prepared to care for real patients.	.000***	.004**	.000***
3. I developed a better understanding of the pathophysiology of the conditions in the scenario.	.000***	.033*	.000***
4. I developed a better understanding of the medications that were in the scenario.	.015*	.026*	.015*
5. I feel more confident in my decision-making skills.	.036*	—	—
6. I am more confident in determining what to tell the healthcare provider.	—	—	.030*
7. My assessment skills improved.	.014*	.025*	.021*
8. I feel more confident that I will be able to recognize changes in my real patient's condition.	.032*	—	.026*
9. I am able to better predict what changes may occur with my real patients.	.004**	—	.002**
10. Completing the simulated clinical experience helped me understand classroom information better.	.003**	.002**	.000***
13. Prebriefing and group discussion were valuable.	—	—	.024*
Confidence score	.000***	.008**	.000***
Learning score	.000***	.007**	.000***
Overall simulation effectiveness	.000***	.003**	.000***

* $p < .05$. ** $p < .01$. *** $p < .001$.

Item 4, "I developed a better understanding of the medications that were in the scenario," demonstrated $p = .002$. Due to the participants being beginning nursing

students, the scenario did not focus on medication administration. In the scenario's shift report, it did state that the patient was on an antibiotic. During prebriefing when care planning was discussed, medications for respiratory patients were identified.

Item 11, "I was challenged in my thinking and decision-making skills," did not demonstrate significance among the groups ($p = .800$). The nonsignificance among the groups could be attributed to similar student perceptions among all groups, no matter which group they were in, that the scenario encouraged their critical thinking. Item 12, "I learned as much from observing my peers as I did when I was actively involved in caring for the stimulated patient," demonstrated $p = .041$. However, post hoc Scheffe analysis demonstrated nonsignificance among the groups.

There were was a place on the measurement tool that allowed participants to write in comments. All written comments can be viewed in Appendix H. Comments were organized according to intervention group of study. Group A (no prebriefing) had the most written comments. Comments from this group were mainly written as explanations why they did not like the simulation or ways to improve the simulation for better learning. For example, one student wrote, "I just felt unsure of the situation which made it difficult to take initiative in the task to help the patient." Another student wrote, "If we were a little better prepared, I think that more people would have participated in the critical thinking aspect. I felt that some of the students were not sure what was expected of them in the simulation."

Group B (prebriefing with both learning-engagement activities and orientation tasks) had the least amount of written comments. Comments from this group verified their perception of learning and enjoyment from the simulation. For example, one

student wrote, “I really enjoyed this simulation and it helped to better know the patient stimuli that I will be working with later on.” Another student valued the prebriefing planning time by stating, “Being able to discuss before really helped me feel more prepared for the scenario.”

Group C (orientation activities only) also had mostly positive comments, which verified their perception of learning. For example, one student wrote, “I really enjoyed the small group simulations; going over it first really helped and made me more confident.” Interestingly, a couple of students wrote about not having guidance on what to do, which is what is covered in orientation tasks of prebriefing. One student wrote, “I feel the simulation, well really the whole experience, could have been more profitable than it was if we had known a little more about what we were supposed to do and if we were more engaged.” Another student wrote, “Pretty short, not sure what I was supposed to get out of this.”

Group D (prebriefing with learning-engagement activities only) had mostly positive comments regarding the simulation experience. For example, one student wrote, “I really enjoyed this! I think the learning technique helped us all work together and believe we all learned something through the experience.” Another student commented on not having the “learning engagement” part of the activity. This student wrote, “It was helpful to know about patient in debriefing but more info on pathophysiology would be better.”

It was noted during simulations that groups with the most learning-engagement activities had more in-depth dialogue within the groups regarding the plan of care and completed scenario tasks according to the cues given. For example, when the assigned

group member who took on the role of the registered nurse stated, “We need to start oxygen,” the assigned tech would immediately apply the nasal cannula and apply it to the mannequin, acting as if the mannequin were a real patient. The other group members voiced their agreement, and then discussions immediately began on what to do next.

The control group who did not receive any prebriefing was noted to have limited dialogue with each other. Instead the control group consistently kept looking at the instructor for guidance. For example, one group member might turn around to the instructor and ask, “Should the patient be given oxygen?” When the instructor responded that she could not offer any guidance, the student then would remain quiet along with the other group members. It was also noted that the majority of the students in the control group did not have insight to the cues given during the scenario. For example, when a student asked about the oxygen, no other group member applied the nasal cannula to the mannequin; instead, a group member offered another suggestion. No one interacted with the mannequin as a real patient.

It was also evident in simulation observations that students with work experience seemed to have more confidence in performing actions during the simulation or were looked upon as the leader. Students would state, “At work we would do this,” or a student would point to another student and state, “You do it, you work at the hospital.” It was also noted during the simulations that students who received both orientation tasks and learning-engagement activities consistently performed better during the scenario compared to students in the other groups, thus reflecting the student perception scores of increased overall simulation effectiveness, learning, and confidence scores.

Reliability Testing

The SET's internal reliability for this study was measured at Cronbach's alpha of .904, which is comparable to Elfrink Cordi et al.'s (2012) previously measured internal reliability of .93. Several studies have utilized SET but did not report internal reliability of the tool (Borjan et al., 2013; Hammer et al., 2014; Masters et al., 2014; Pope et al., 2013; Zhang et al., 2014).

One item was identified as poorly functioning among the groups, Item 11, "I was challenged in my thinking and decision-making skills." It is not surprising that this item did not distinguish well between the groups, for the scenario might have been challenging to all groups. The internal reliability recalculated for the instrument after deletion of Item 11 was measured at Cronbach's alpha .902.

Hypothesis Testing

Values of normality have been measured to ensure homogeneity assumption is met in order to perform univariate ANOVA for hypothesis testing. The Pearson's chi-square goodness-of-fit test failed to reject the null hypothesis that the data by gender ($p = .706$), race ($p = .376$), work experience ($p = .469$), and simulation experience ($p = .471$) were not normally distributed among the intervention groups. Thus, all intervention groups were considered normally distributed (Table 1).

The first hypothesis tested was H1: Undergraduate nursing students' perceptions of overall simulation effectiveness will be significantly higher with the use of prebriefing orientation and learning-engagement activities (Group B) compared to no prebriefing (Group A). ANOVA results showed $df = 3$, $F = 13.752$, $p = .000$, presented in Table 3. Thus the hypothesis was accepted, and the null hypothesis, that there would be no

significant difference between undergraduate nursing students' perceptions of overall simulation effectiveness with the use of prebriefing orientation and learning-engagement activities compared to no prebriefing, was rejected.

The second hypothesis tested was H2: Undergraduate nursing students' perceptions of learning will be significantly higher with the use of prebriefing orientation and learning-engagement activities (Group B) compared to no prebriefing (Group A). ANOVA results showed $df = 3$, $F = 11.585$, $p = .000$ (see Table 3). The hypothesis was accepted, and the null hypothesis, that there would be no significant difference between undergraduate nursing students' perceptions of learning with the use of prebriefing orientation and learning-engagement activities compared to no prebriefing, was rejected.

The third hypothesis tested was H3: Undergraduate nursing students' perceptions of self-confidence will be significantly higher with the use of prebriefing orientation and learning-engagement activities (Group B) compared to no prebriefing (Group A). ANOVA results showed $df = 3$, $F = 10.380$, $p = .000$ (Table 3). The hypothesis was accepted, and the null hypothesis, that there would be no significant difference between undergraduate nursing students' perceptions of self-confidence with the use of prebriefing orientation and learning-engagement activities compared to no prebriefing, was rejected.

The fourth hypothesis tested was H4: Undergraduate nursing students' perceptions of overall simulation effectiveness with the use of prebriefing learning-engagement activities only (Group D) will be significantly higher compared to prebriefing orientation activities only (Group C) in prebriefing. The post hoc Scheffe test was computed to clarify which groups among the sample in specific had significant

differences. The Scheffe results demonstrated $p = .292$ between the learning-engagement activities only group and the orientation tasks only group (see Appendix G). The hypothesis was rejected, and the null hypothesis, that there would be no significant difference between undergraduate nursing students' perceptions of overall simulation effectiveness with the use of prebriefing learning-engagement activities only compared to prebriefing orientation activities only, was accepted .

The fifth hypothesis tested was H5: Undergraduate nursing students' perceptions of learning with the use of prebriefing learning-engagement activities only (Group D) will be significantly higher compared to prebriefing orientation activities only (Group C) in prebriefing. The post hoc Scheffe test was computed to clarify which groups among the sample in specific had significant differences. The Scheffe results demonstrated $p = .240$ among the learning-engagement activities only group and the orientation tasks only group (see Appendix G). The hypothesis was rejected, and the null hypothesis, that there would be no significant difference between undergraduate nursing students' perceptions of overall learning with the use of prebriefing learning-engagement activities only compared to prebriefing orientation activities only, was accepted.

The final hypothesis tested was H6: Undergraduate nursing students' perceptions of self-confidence with the use of prebriefing learning-engagement activities only (Group D) will be significantly higher compared to prebriefing orientation activities only (Group C). The post hoc Scheffe test was computed to clarify which groups among the sample in specific had significant differences. The Scheffe results demonstrated $p = .613$ among the learning-engagement activities only group and the orientation tasks only group (see Appendix G). The hypothesis was rejected, and the null hypothesis, that there would be

no significant difference between undergraduate nursing students' perceptions of self-confidence with the use of prebriefing learning-engagement activities only compared to prebriefing orientation activities only, was accepted.

In addition to the hypothesis testing, ANOVA was performed to determine if there were any significant differences among sample group participants' work experience, simulation experience, and college of nursing setting and their overall SET score, learning score, or confidence score. Approaching significance was found between simulation experience and overall SET score ($p = .068$), learning score ($p = .061$) or confidence score ($p = .070$), as shown in Table I1 in Appendix I. There was no significance found between college setting and their overall SET score ($p = .473$), learning score ($p = .169$) or confidence score ($p = .892$), which validates the assumption that participants from the two different colleges were similar in education background, work experience, and simulation experience (Table I2). Interestingly, significance was found among work experience and confidence scores ($p = .041$), but no significance was found among work experience and overall SET score ($p = .101$) or learning score ($p = .168$), as shown in Table I3 in Appendix I. The finding that participants with work experience scored higher on the confidence scale score is not surprising, for it is well known that experience influences confidence levels (Lightman, Kingdon, & Nelson, 2015; Liou, Chang, Tasai, & Cheng, 2013; Usher, Mills, West, Park, & Woods, 2015).

Chapter Summary

The quasi-experimental, posttest-only design randomized 119 students into four groups: no prebriefing, prebriefing learning-engagement and orientation activities, prebriefing orientation activities only, and prebriefing learning-engagement activities

only. Results supported the hypothesis that undergraduate nursing students' perceptions of overall simulation effectiveness, learning, and confidence would be significantly higher with the use of prebriefing orientation and learning-engagement activities compared to no prebriefing. No significant difference was found between groups with prebriefing orientation activities only and learning-engagement activities only, thus supporting the assumption that both elements are valued similarly. The final chapter discusses implications and recommendations of findings.

Chapter 5

Discussion and Summary

There is an identified gap in the nursing literature regarding prebriefing and its value to the simulation process. This study examined 119 undergraduate nursing students' perception of prebriefing and its overall simulation effectiveness. The quasi-experimental, posttest-only design examined four groups: no prebriefing, prebriefing learning-engagement and orientation activities, prebriefing orientation activities only, and prebriefing learning-engagement activities only.

The design of the study was rooted in the theoretical framework of SLT, also known as situated cognition theory. SLT considers learning as a social phenomenon rather than the action of an individual assimilating knowledge (Stein, 1998). Lave and Wenger (1991) defined the assumptions of SLT as follows: (a) Active teaching methods are utilized to acquire knowledge, (b) knowledge is obtained through interactions with other learners and their environment, (c) knowledge is elicited from environmental cues and dialogue of learner community rather than structured by the instructor, and (d) practice is utilized to perfect the newly learned knowledge.

Prebriefing practices, in particular learning-engagement activities, reflect the theoretical framework of SLT through the interactions among the group, which includes young learners (students) and master learners (faculty). Learning is elicited from environmental cues (engagement activities) and dialogue within the learner community (Lave & Wenger, 1991).

The concepts of SLT evidently are critical to the learning outcomes of the teaching and learning strategy of simulation. In particular, simulation needs to support a

community learning environment where students are encouraged to work as a team and to practice their new knowledge before applying it to the scenario. These key elements to an effective simulation all can be employed into prebriefing.

It is also important during prebriefing activities for the expert (instructor) to offer guidance on required actions during the scenario to the learner (student). For example, in the groups with the most learning engagement, the students were given time to discuss what a respiratory distress client would look like and what they would do to care for this client. From these discussions, the group then applied this newly learned knowledge to the scenario.

Summary of Findings

The findings of this study support the use of prebriefing rooted in the concepts of SLT. Groups who received orientation activities or guidance on required actions during the scenario were more apt to listen to the cues given and apply the tasks accordingly. Findings from the measurement tool did not find any significant difference among perceptions of one form of prebriefing (orientation tasks or learning-engagement activities), thus leading to the assumption that both elements are essential to the learner. Group dialogue in prebriefing and during the scenario improved the overall simulation process and should be encouraged and facilitated by faculty, not led. Therefore, in best practice, before the hands-on scenario begins, learners should be provided with a thorough prebriefing that reflects the concepts of SLT through learning-engagement and orientation activities.

Another finding of the study is that students appreciated the time to dialogue and create a care plan for a patient's illness based on the objectives given for the scenario.

Students commented that having time before the scenario and reviewing appropriate assessment, intervention, and evaluation strategies learned in theory assisted with their confidence and engagement level during the hands-on part of the simulation. It is recommended that enough time is allotted for prebriefing principles to occur, thus improving students' learning and engagement.

Clearly identified roles and responsibilities during prebriefing also improved the overall simulation process. Students need guidance on behavior expectations during simulation and what is allowed or not allowed among the group during the scenario. It is highly encouraged that student observers take an active role in the simulation and act as a nurse consult for the identified team leader during the scenario to further encourage group dialogue and discussion of environmental cues that are essential to SLT.

Students with work experience were often looked upon as leaders of the group, even if they were not appointed the team leading role. Allowing this dialogue to occur encourages teamwork and looking upon selecting appropriate leaders based on individuals' unique resources that can be offered to meet the group needs.

Prebriefing increases students' perceptions of confidence and learning gains and perception of overall simulation effectiveness. It is an essential phase to incorporate into the simulation process. Prebriefing is a valuable platform to promote learning among the learners.

Integration of the Findings With Previous Literature

As stated previously, there is a major gap in the literature regarding prebriefing, so comparing similar findings with other studies is a challenge. Elfrink et al. (2009) conducted evaluation research on ways to improve the simulation learning experience of

their nursing students. They noted that students ($N = 114$) identified most frequently that the preplanning sessions (34%) were most helpful to the simulation learning experience compared to debriefing (19%). This contrasts with the Kelly et al. (2014) study, where students ($N = 102$) ranked briefing and orientation to the simulation area as ninth out of 11 simulation components as the most helpful. This research project only studied one element of simulation, prebriefing, so it is difficult to compare to other studies in stating that prebriefing is perceived by students as more valuable than debriefing.

Prebriefing as an independent variable has not been studied before. The limited research on prebriefing could be due to being overshadowed by its counterpart, debriefing, which has been the focus in simulation literature for the past decade. When performing a Cumulative Index to Nursing and Allied Health Literature search with the keywords *debriefing AND simulation*, 239 articles populated, compared to the 5 articles populated with the keywords *prebriefing AND simulation*.

Implications of the Findings

Implications for Nursing Education

The findings of this study support the value prebriefing has to the overall simulation effectiveness. Findings from the observations and students' written comments reveal the need for faculty to make certain prebriefing is considered the norm for simulation and not an option or afterthought.

The study utilized the theoretical framework, SLT, which is commonly found in nursing education and in particular with the teaching intervention of simulation, due to its focus on participative teaching methods (Holland et al., 2013; Kaakinen & Arwood, 2009; Onda, 2011; Paige & Daley, 2009; Rourke et al., 2010). Nursing educators reading

this study can be informed of how to design prebriefing utilizing SLT and improve their overall simulation effectiveness. For example, faculty can build learning into the interaction process and discussions during prebriefing by providing environmental cues and emphasizing learner dialogue versus the customary written faculty instructions. Prebriefing should be given similar attention to debriefing. The time to do both may even equal the time to debrief alone, anchoring the learning on both ends.

Implications for Nursing Practice

Although the tool did not measure individuals' perceptions regarding prebriefing impacting teamwork, teamwork was evident from the observations during simulation. Effective team work is understood to be essential to provide effective patient care. Prebriefing engages learners in the process of teamwork and could be a vital avenue in incorporating other teamwork training, such as the common CRM training system used in the healthcare industry (Aebersold et al., 2013; Clay-Williams et al., 2014; Kleiner et al., 2014; O'Dea et al., 2014; Paull et al., 2013; Tschannen et al., 2015).

This study's findings support student nurses' value in prebriefing. Prebriefing is an essential phase in simulation for student planning and learning through dialogue. The concept of prebriefing could be applied to other healthcare settings besides simulation learning. Nursing practice can include prebriefings before the start of a work shift or difficult surgical case to promote teamwork and learning, in particular for novice nurses. Since prebriefing through TeamSTEPPS and CRM is an expectation, building prebriefing into the practice environment when simulation is the teaching technique should be quite easy and may be an inherent part of scenario building.

Implications for Nursing Research

There are multiple names and various practices regarding prebriefing. In order to provide rigorous research, prebriefing must be categorized in a standardized way. The intervention of this study was designed according to a concept analysis by this researcher (Chamberlain, 2015) that defined prebriefing as an educator-designed phase of simulation that is implemented at a designated time prior to the hands-on scenario and includes both orientation tasks and learning-engagement activities that will enhance learner satisfaction, participation, and effectiveness of the simulation experience. This standardized definition can guide future research and ensure that the prebriefing is applied throughout simulation labs consistently. The findings of this study support that prebriefing does impact perceptions of overall simulation effectiveness, which highlights the potential impact this variable has in influencing study outcomes. The dissemination of this study's findings could guide future research in interventional design and analysis of influential variables.

Future recommendations include replicating this study in other similar settings to provide a larger sample. If similar studies are consistent and reflective of this study's findings, then evidence-based standards can be established for simulation organizations, accreditors, faculty, and researchers to use.

Another future recommendation is to extend the research into other populations to determine if prebriefing is valued in all settings, such as in hospital settings where healthcare team members have an already established practice and foundation of knowledge and skills. Prebriefing such as orientation activities may be highly valuable to

established practitioners over learning-engagement activities. These findings can help guide and distinguish essential simulation elements of students and practitioners.

Since no significant difference was found between prebriefing orientation activities and learning-engagement activities, future research should explore which elements of orientation and active learning during prebriefing are essential to impact simulation effectiveness. The findings of this recommended study could help faculty design effective prebriefing using appropriate resources of time, space, and personnel.

Lastly, during the time of this research study the authors of the SET revised their tool (Leighton, Ravert, Mudra, & Macintosh, 2015). The tool now includes items regarding prebriefing and debriefing. Future research in determining simulation effectiveness should use this established and reliable tool to determine which phase of the simulation, prebriefing, debriefing, or actual scenario is most valued by learners.

Implications for Public Policy

Nursing programs may begin to increase their simulation use in response to the National Council of State Boards of Nursing landmark study (Hayden et al., 2014) stating the teaching strategy of HFS can substitute up to half of student clinical practice hours and produce the same educational outcomes and practice readiness as full student clinical setting practice hours would. To reach these outcomes, it will be critical that the simulation labs in nursing programs be of high quality, with faculty who are educated in the pedagogy, thus influencing program policy and accreditation standards. The findings of this study add to the pedagogy of simulation and can enhance the quality of nursing programs' simulation labs.

This study has demonstrated the value of prebriefing compared to no prebriefing in promoting overall simulation effectiveness, learning, and confidence. Prebriefing should be added as an essential step to simulation and should be emphasized among simulation organizations' standards, policies, and practices.

Limitations

Selection threat was a concern due to the lack of randomization of participants in groups. Simulation programs in undergraduate nursing schools customarily provide scenarios in groups, such as preassigned clinical groups, to enhance resource utilization and the student learning experience. These customary groups (clinical groups) established by the nursing program served as the study's groups. In order to minimize the selection threat, each clinical group was randomly assigned to one of the experimental or comparison groups. Upon cross-tab analysis and chi-square analysis, no significance was found among the groups, and thus homogeneity of the groups was assumed.

Another internal threat included instrumentation. The researcher altered the last item on the SET because it related to debriefing. The item was revised to measure and read "Prebriefing and group discussion were valuable." However, the internal reliability of the SET measured at Cronbach's alpha of .904 (with this item removed), which was similar to the original tool's reliability measurement of .93.

Chapter Summary

There is an identified gap in the nursing literature regarding prebriefing and its value to the simulation process. This study examined 119 undergraduate nursing students' perception of prebriefing and its impact on overall simulation effectiveness at two different college of nursing programs. The quasi-experimental, posttest-only design

rooted in SLT examined four groups: no prebriefing, prebriefing learning-engagement and orientation activities, prebriefing orientation activities only, and prebriefing learning-engagement activities only. The findings of the study did show significance in that students who participated in prebriefing activities of learning engagement and orientation perceived overall higher simulation effectiveness compared to the control group that received no prebriefing. There was no significant difference identifying which prebriefing element (learning-engagement activities or orientation tasks) was valued more, thus leading to the assumption that both learning-engagement activities and orientation tasks are essential to the participant for overall learning and simulation effectiveness. The observations during the simulations and written comments from the students supported this assumption. These findings not only fill in the literature gap but also can help educators to design effective simulations, researchers to conduct more rigorous simulation studies, and organizations to support a standardized definition and process of prebriefing. However, a great need remains to further explore prebriefing to ensure nursing students have the most effective simulation experience to ensure self-confidence and learning that can be transferred into their future nursing practice.

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Appendix A

IRB Materials

NOVA SOUTHEASTERN UNIVERSITY
Office of Grants and Contracts
Institutional Review Board



MEMORANDUM

To: Jill Chamberlain
Health Professions Division – College of Nursing

From: Jo Ann Klcier, PhD, EdD, ARNP
Institutional Review Board

Date: August 12, 2015

Re: *The Impact of Prebriefing Phase on Undergraduate Nursing Simulation*

Jo Ann Klcier
Signature

I have reviewed the above-referenced research protocol at the center level. Based on the information provided, I have determined that this study is exempt from further IRB review. You may proceed with your study as described to the IRB. As principal investigator, you must adhere to the following requirements:

- 1) **CONSENT:** If recruitment procedures include consent forms these must be obtained in such a manner that they are clearly understood by the subjects and the process affords subjects the opportunity to ask questions, obtain detailed answers from those directly involved in the research, and have sufficient time to consider their participation after they have been provided this information. The subjects must be given a copy of the signed consent document, and a copy must be placed in a secure file separate from de-identified participant information. Record of informed consent must be retained for a minimum of three years from the conclusion of the study.
- 2) **ADVERSE EVENTS/REACTIONS:** The principal investigator is required to notify the IRB chair and me (954-262-5369 and 954-262-1978 respectively) of any adverse reactions or unanticipated events that may develop as a result of this study. Reactions or events may include, but are not limited to, injury, depression as a result of participation in the study, life-threatening situation, death, or loss of confidentiality/anonymity of subject. Approval may be withdrawn if the problem is serious.
- 3) **AMENDMENTS:** Any changes in the study (e.g., procedures, number or types of subjects, consent forms, investigators, etc.) must be approved by the IRB prior to implementation. Please be advised that changes in a study may require further review depending on the nature of the change. Please contact me with any questions regarding amendments or changes to your study.

The NSU IRB is in compliance with the requirements for the protection of human subjects prescribed in Part 46 of Title 45 of the Code of Federal Regulations (45 CFR 46) revised June 18, 1991.

Cc: Protocol File
Office of Grants and Contracts (if study is funded)

3301 College Avenue • Fort Lauderdale, FL 33314-7796 • (954) 262-5369
Fax: (954) 262-3977 • Email: inga@nsu.nova.edu • Web site: www.nova.edu/cwis/ogc

To: Jill Chamberlain
 From: Dr. Karla Luxner, IRB Chair
 Re: IRB S15-23: The Impact of Prebriefing Phase on Undergraduate Nursing Simulation
 Date: July 17, 2015

In accordance with Millikin University IRB policies and 45 CFR 46, the Federal Policy for the Protection of Human Subjects, I am pleased to notify you that the IRB has reviewed your proposal and finds it meets the qualifications for "Exempt from Review."

If, during your study, you encounter any unanticipated problems involving risks to participants, you must report this immediately to the IRB Chair, Dr. Karla Luxner (217-424-3952, kluxner@millikin.edu) or contact Dr. Jeffery Aper, Provost (217-424-6220, japer@millikin.edu)

If you have administrative questions, contact Andrea Ohl (217-424-6677) or via email (aohl@millikin.edu).

The IRB wishes you the best on the completion of your research.

Respectfully,



Dr. Karla Luxner
 IRB Chair
 Millikin University

CC: Andrea Ohl



MILLIKIN
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July 30, 2015

Jill Chamberlain, doctoral candidate at Nova Southeastern University, has permission and support to conduct her educational intervention research study "*The Impact of Prebriefing Phase on Undergraduate Nursing Simulation*" at St. John's College. The purpose of this study is to describe the influence of the prebriefing phase during simulation on undergraduate nursing students' perceptions of overall simulation effectiveness, learning, and self-confidence.

St. John's College undergraduate students are familiar with simulation as it is critical component of our medical-surgical nursing courses. Mary Ellen Carlson, course chair of Medical Surgical Nursing I, has scheduled simulations for Fall 2015 and has agreed to incorporate Jill's study during this time. Understanding more about prebriefing will benefit future students at the College. Please do not hesitate to contact us if you have further questions.

Thank you,

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Appendix B
Study Protocol

Group A (Control, no prebriefing)	Group B	Group C	Group D
	Orientation Activities	Orientation Activities Only	
	AND Learning- Engagement Activities		Learning- Engagement Activities Only
Respiratory Distress Scenario	Respiratory Distress Scenario	Respiratory Distress Scenario	Respiratory Distress Scenario
Simulation Effectiveness Tool and Demographic Survey Completion	Simulation Effectiveness Tool and Demographic Survey Completion	Simulation Effectiveness Tool and Demographic Survey Completion	Simulation Effectiveness Tool and Demographic Survey Completion

Appendix C

Simulation Intervention

PREBRIEFINGOrientation Activities with Participants (5-7 minutes):*Review Learning Objectives for Scenario:*

- Participants will successfully identify patient in respiratory distress
- Participants will successfully implement caring strategies for patient in respiratory distress

Review and Identify Participant Roles:

- RN Team leader – participant will be team leader during simulation and delegate tasks accordingly
- 2nd RN – participant will help team leader and offer possible solutions
- Patient Care Technician – participant will perform tasks delegated by RN team leader
- Observer – Take notes regarding participants' actions for debriefing discussion (what went well, what was confusing, what safety concerns are identified)

Review Expectations:

- Establish Trusting Environment
 - Confidentiality – no discussion with other classmates
 - Respect – work as a team, focus on learning opportunities
 - Not used for a grading tool, it is designed as a self-assessment tool to identify areas of weakness and strengths
- Disbelief – enhance simulation's effectiveness with suspension of disbelief
- Debrief – after simulation you will go into next room and discuss the simulation (how did you feel about the simulation, what went well, what was confusing, what safety concerns are identified)

Review Mannequin and Equipment:

- How to elevate head of bed
- How to assess vital signs
- How to apply pulse ox
- How to locate and apply oxygen equipment

Learning-Engagement Activities with participants (13-15 minutes):

- *Watch video on respiratory assessment:*
<https://www.youtube.com/watch?v=bHGlFmd4Fuk>
- *Complete worksheet on respiratory assessment*

- *Discuss Care Plan for Respiratory Distress Client:*
 - What would assessment look like?
 - What would be your plan/interventions?
 - How do you know your plan worked?

SCENARIO (Scenario will end when group correctly responds to tasks or 5 minutes whichever comes first)

Shift Report: This is Mr. Jones, he is 72 years old for Dr. Smith. He was admitted last night with a diagnosis of pneumonia. He states he was fighting a cold for weeks and never could get better. He went to the emergency department last night after he was severely short of breath from walking from couch to bathroom in his house. He was started on Levaquin and has a 20 gauge IV in his right hand. He has been on 2 L of O2 per nasal cannula through the night but states he is feeling much better now so he is off of it. He has no known allergies. He has a history of 30 pack year of smoking, hyperlipidemia, and diabetes type 2 controlled by diet.

- Scene 1: Mr. Jones is lying flat in bed. Starts to cough and asks for nurse.
- Scene 2: Team arrives. Team should ask Mr. Jones of problem and do assessment. Assessment findings will reveal RR 28, O2 stat of 88%, with bibasilar crackles.
 - If team does not do tasks in scenario, patient will give cues to participants such as I feel wheezy, I feel like I can't catch my breath, I felt better when I had that oxygen on
- Scene 3: Team Implements Care Plan
 - Head of bed elevated, O2 applied
- Scene 4: Once interventions completed, pulse ox will increase slowly and RR will decrease.
 - If team does not reassess, patient will give cues to participants such as I feel better, do I look better, what does my oxygen say now.

END SCENARIO – Complete Post SET Tool & Debrief with Instructor

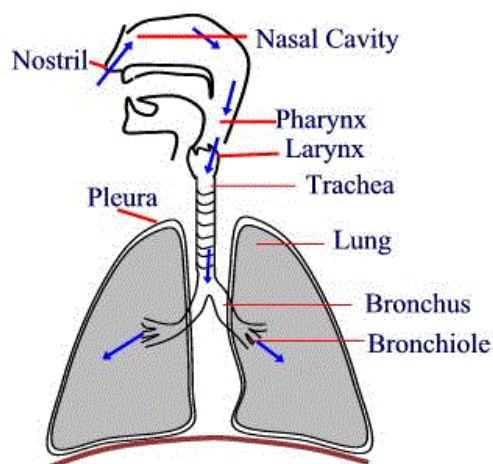
Respiratory Worksheet for Prebriefing Learning Engagement Activity

Normal Respiratory Rate: _____

Normal Pulse Ox Saturation: _____

Lung Sound	Description of Sound	Possible Causes
Clear		
Crackles		
Rhonchi		
Wheeze		
Stridor		

Place an "X" where you would listen for lung sounds:



Appendix D

The SET

Please circle the number that best reflects your opinion about your simulation experience.

	Do Not Agree	Somewhat Agree	Strongly Agree	Not applicable
1. The instructor's questions helped me to think critically.	0	1	2	NA
2. I feel better prepared to care for real patients.	0	1	2	NA
3. I developed a better understanding of the pathophysiology of the conditions in the simulated clinical experience.	0	1	2	NA
4. I developed a better understanding of the medications that were in the simulated clinical experience.	0	1	2	NA
5. I feel more confident in my decision making skills.	0	1	2	NA
6. I am more confident in determining what to tell the healthcare provider.	0	1	2	NA
7. My assessment skills improved.	0	1	2	NA
8. I feel more confident that I will be able to recognize changes in my real patient's condition.	0	1	2	NA
9. I am able to better predict what changes may occur with my real patients.	0	1	2	NA
10. Completing the simulated clinical experience helped me understand classroom information better.	0	1	2	NA
11. I was challenged in my thinking and decision-making skills.	0	1	2	NA
12. I learned as much from observing my peers and I did when I was actively involved in caring for the simulated patient.	0	1	2	NA
13. Prebriefing and group discussion were valuable.	0	1	2	NA

Comments: _____

Appendix E

Demographic Survey

Please complete the demographic study by filling in or selecting the answer that best represents you.

Age	<input type="checkbox"/> 18-22 years old <input type="checkbox"/> 23-30 years <input type="checkbox"/> 31-49 years <input type="checkbox"/> 50+ years
Gender	<input type="checkbox"/> female <input type="checkbox"/> male
Race	<input type="checkbox"/> African American <input type="checkbox"/> Asian <input type="checkbox"/> Caucasian <input type="checkbox"/> Hispanic <input type="checkbox"/> Latino <input type="checkbox"/> Native American <input type="checkbox"/> Pacific Islander <input type="checkbox"/> Other: _____ <input type="checkbox"/> Do not want to respond
Do you have experience working as a nursing assistant or equivalent to this role such as EMT, nursing tech, etc.	<input type="checkbox"/> no <input type="checkbox"/> yes

Appendix F

Simulation Effectiveness Tool Item Scores by Intervention Group

Item	Group A		Group B		Group C		Group D		F	Sig.
	M	SD	M	SD	M	SD	M	SD		
1. The instructor's questions helped me to think critically.	1.06	0.64	1.81	0.40	1.67	0.48	1.82	0.40	11.783	.000
2. I feel better prepared to care for real patients.	0.78	0.81	1.48	0.51	1.19	0.51	1.27	0.46	9.988	.000
3. I developed a better understanding of the pathophysiology of the conditions in the simulated clinical experience.	0.78	0.73	1.71	0.46	1.38	0.67	1.64	0.49	11.937	.000
4. I developed a better understanding of the medications in the simulated clinical experience.	0.33	0.59	0.90	0.83	0.86	0.57	0.91	0.68	5.411	.002
5. I feel more confident in my decision-making skills.	0.94	0.80	1.38	0.59	1.29	0.72	1.09	0.53	3.427	.020
6. I am more confident in determining what to tell the healthcare provider.	0.72	0.67	1.14	0.66	1.10	0.83	1.23	0.75	3.916	.011
7. My assessment skills improved.	1.06	0.73	1.43	0.51	1.33	0.73	1.41	0.67	5.204	.002
8. I feel more confident that I will be able to recognize changes in my real patient's condition.	0.94	0.87	1.48	0.68	1.19	0.60	1.50	0.51	4.199	.007
9. I am able to better predict what changes may occur with my real patients.	0.72	0.83	1.48	0.60	1.10	0.63	1.45	0.51	6.918	.000
10. Completing the simulated clinical experience helped me understand classroom information better.	0.83	0.86	1.43	0.60	1.38	0.59	1.55	0.60	8.869	.000
11. I was challenged in my thinking and decision-making skills.	1.39	0.70	1.67	0.58	1.43	0.68	1.59	0.50	0.334	.800
12. I learned as much from observing my peers as I did when I was actively involved in caring for the simulated patient.	1.39	0.70	1.62	0.50	1.48	0.51	1.59	0.59	2.842	.041

Item	Group A		Group B		Group C		Group D		F	Sig.
	M	SD	M	SD	M	SD	M	SD		
13. Prebriefing and group discussion were valuable.	1.39	0.70	1.71	0.46	1.57	0.60	1.82	0.40	3.526	.017
Confidence score	4.11	3.05	6.95	2.25	5.86	2.52	6.55	2.06	10.380	.000
Learning score	8.22	3.77	12.29	2.61	11.10	3.25	12.32	2.66	11.585	.000
Overall simulation effectiveness	12.33	6.51	19.19	4.33	16.90	5.82	18.86	4.97	13.752	.000

Note. $df = 3$ for all items. Group A (no prebriefing) $n = 29$, Group B (prebriefing of learning-engagement and orientation tasks) $n = 29$, Group C (prebriefing of orientation only) $n = 32$, and Group D (prebriefing of learning engagement only) $n = 28$. Item scores based on a scale of 0 (*do not agree*), 1 (*somewhat agree*), and 2 (*strongly agree*).

Appendix G

Post Hoc Analysis by Item

Intervention group (I)	Intervention group (J)	<i>M</i> difference (I-J)	<i>SE</i>	Sig.	Lower bound	Upper bound
1. The instructor's questions helped me to think critically.						
Group A (no prebrief)	Group B	-.650	.130	.000	-1.02	-0.28
	Group C	-.547	.130	.001	-0.92	-0.18
	Group D	-.679	.131	.000	-1.05	-0.31
Group B (both)	Group C	.103	.129	.886	-0.26	0.47
	Group D	-.028	.130	.997	-0.40	0.34
Group C (orientation)	Group D	-.132	.130	.795	-0.50	0.24
2. I feel better prepared to care for real patients.						
Group A	Group B	-.798	.162	.000	-1.26	-0.34
	Group C	-.591	.162	.004	-1.04	-0.14
	Group D	-.726	.162	.000	-1.19	-0.27
Group B	Group C	.206	.156	.630	-0.24	0.65
	Group D	.071	.160	.978	-0.38	0.53
Group C	Group D	.135	.156	.863	-0.58	0.31
3. I developed a better understanding of the pathophysiology of the conditions in the simulated clinical experience.						
Group A	Group B	-.874	.165	.000	-1.34	-0.40
	Group C	-.477	.159	.033	-0.93	-0.30
	Group D	-.812	.164	.000	-1.28	-0.35
Group B	Group C	.397	.163	.121	-0.07	0.86
	Group D	.062	.168	.987	-0.42	0.54
Group C	Group D	.355	.161	.237	0.79	0.12
4. I developed a better understanding of the medications that were in the simulated clinical experience.						
Group A	Group B	-.649	.195	.015	-1.20	-0.09

Intervention group (I)	Intervention group (J)	<i>M</i> difference (I-J)	<i>SE</i>	Sig.	Lower bound	Upper bound
	Group C	-.581	.187	.026	-1.11	-0.05
	Group D	-.649	.195	.015	-1.20	-0.09
Group B	Group C	.068	.193	.989	-0.48	0.62
	Group D	.000	.201	1.00	-0.57	0.57
Group C	Group D	-.068	.193	.989	-0.62	0.48
5. I feel more confident in my decision-making skills.						
Group A	Group B	-.517	.174	.036	-1.01	-0.02
	Group C	-.437	.172	.099	-0.93	0.05
	Group D	-.318	.175	.355	-0.82	0.18
Group B	Group C	.800	.172	.975	-0.41	0.57
	Group D	.200	.175	.731	-0.30	0.70
Group C	Group D	.119	.174	.926	-0.37	0.61
6. I am more confident in determining what to tell the healthcare provider.						
Group A	Group B	-.458	.186	.116	-0.99	0.07
	Group C	-.519	.185	.054	-1.04	0.01
	Group D	-.571	.188	.030	-1.11	-0.04
Group B	Group C	-.061	.183	.990	-0.58	0.46
	Group D	-.113	.186	.946	-0.64	0.42
Group C	Group D	-.052	.185	.994	-0.58	0.47
7. My assessment skills improved.						
Group A	Group B	-.549	.166	.014	-1.02	-0.08
	Group C	-.515	.166	.025	-0.98	-0.05
	Group D	-.531	.167	.021	-1.01	-0.06
Group B	Group C	.034	.167	.998	-0.44	0.51
	Group D	.018	.168	1.00	-0.46	0.50
Group C	Group D	-.016	.168	1.00	-0.46	0.49

Intervention group (I)	Intervention group (J)	<i>M</i> difference (I-J)	<i>SE</i>	Sig.	Lower bound	Upper bound
8. I feel more confident that I will be able to recognize changes in my real patient's condition.						
Group A	Group B	-.517	.171	.032	-1.00	-0.03
	Group C	-.320	.169	.312	-0.80	0.16
	Group D	-.537	.173	.026	-1.03	-0.05
Group B	Group C	.197	.169	.714	-0.28	0.68
	Group D	-.200	.173	1.00	-0.51	0.47
Group C	Group D	-.217	.170	.655	-0.27	0.70
9. I am able to better predict what changes may occur with my real patients.						
Group A	Group B	-.649	.172	.004	-1.14	-0.16
	Group C	-.392	.169	.153	-0.87	0.09
	Group D	-.702	.174	.002	-1.20	-0.21
Group B	Group C	.257	.171	.522	-0.23	0.74
	Group D	-.053	.175	.993	-.55	0.44
Group C	Group D	-.310	.172	.361	-0.80	0.18
10. Completing the simulated clinical experience helped me understand classroom information better.						
Group A	Group B	-.668	.172	.003	-1.16	-0.18
	Group C	-.685	.171	.002	-1.17	-0.20
	Group D	-.815	.175	.000	-1.31	-0.32
Group B	Group C	-.017	.168	1.00	-0.49	0.46
	Group D	-.147	.172	.866	-0.64	0.34
Group C	Group D	-.130	.171	.901	-0.61	0.35
11. I was challenged in my thinking and decision-making skills.						
Group A	Group B	-.103	.156	.931	-0.55	0.34
	Group C	.020	.152	.999	-0.41	0.45
	Group D	-.091	.157	.953	-0.54	0.35
Group B	Group C	.124	.152	.881	-0.31	0.56
	Group D	0.12	.157	1.00	-0.43	0.46

Intervention group (I)	Intervention group (J)	<i>M</i> difference (I-J)	<i>SE</i>	Sig.	Lower bound	Upper bound
Group C	Group D	-.112	.154	.912	-0.55	0.32
12. I learned as much from observing my peers as I did when I was actively involved in caring for the simulated patient.						
Group A	Group B	-.367	.151	.123	-0.80	0.06
	Group C	-.157	.149	.772	-0.58	0.26
	Group D	-.378	.154	.117	-0.82	0.06
Group B	Group C	.210	.150	.584	-0.22	0.64
	Group D	-.011	.155	1.00	-0.45	0.43
Group C	Group D	-.221	.153	.558	-0.65	0.21
13. Prebriefing and group discussion were valuable.						
Group A	Group B	-.323	.146	.185	-0.74	0.09
	Group C	-.213	.142	.524	-0.62	0.19
	Group D	-.450	.143	.024	-0.86	-0.04
Group B	Group C	.110	.143	.899	-0.30	0.52
	Group D	-.126	.145	.858	-0.54	0.28
Group C	Group D	-.236	.141	.423	-0.64	0.16
Confidence score						
Group A	Group B	-3.168	.653	.000	-5.02	-1.31
	Group C	-2.258	.638	.008	-4.07	-0.45
	Group D	-3.133	.659	.000	-5.00	-1.26
Group B	Group C	.909	.643	.574	-0.92	2.73
	Group D	.034	.665	1.000	-1.85	1.92
Group C	Group D	-.875	.649	.613	-2.72	0.97
Learning score						
Group A	Group B	-3.720	.813	.000	-6.03	-1.41
	Group C	-2.821	.794	.007	-5.07	-0.57
	Group D	-4.490	.821	.000	-6.82	-2.16

Intervention group (I)	Intervention group (J)	<i>M</i> difference (I-J)	<i>SE</i>	Sig.	Lower bound	Upper bound
Group B	Group C	.899	.801	.739	-1.37	3.17
	Group D	-.771	.828	.833	-3.12	1.58
Group C	Group D	-1.670	.808	.240	-3.96	0.62
Overall simulation effectiveness						
Group A	Group B	-7.198	1.334	.000	-10.98	-3.41
	Group C	-5.048	1.301	.003	-8.74	-1.36
	Group D	-7.624	1.346	.000	-11.44	-3.81
Group B	Group C	2.150	1.313	.447	-1.58	5.87
	Group D	-.426	1.357	.999	-4.28	3.42
Group C	Group D	-2.576	1.325	.292	-6.34	1.18

Note. Group A (no prebriefing) $n = 29$, Group B (prebriefing of learning-engagement and orientation tasks) $n = 29$, Group C (prebriefing of orientation only) $n = 32$, and Group D (prebriefing of learning engagement only) $n = 28$.

Appendix H

Participant Written Comments

Group	Comments
Group A (no prebriefing)	<p>Very little or no instruction. No hands-on practice/assessment—just students talking about what their suggestions are for assessing and possible treatment.</p> <p>The study has 3 groups. I assume one with active coaching, one with no coaching—this group, and one with mid level coaching and you are trying to see if one simulation better prepares students when they are active. Overall I agree with the hypothesis.</p> <p>Without the base of knowledge and limited experience the simulation was more confusing than helpful.</p> <p>Had no clue what was supposed to be done, no previous sim before and no instructions on what we should be doing.</p> <p>I have no experience so being asked to assess an unknown problem didn't do much for me.</p> <p>If we were a little better prepared, I think that more people would have participated in the critical thinking aspect. I felt that some of the students were not sure what was expected of them in the simulation.</p> <p>I just felt unsure of the situation which made it difficult to take initiative in the task to help the patient. I would have taken over but didn't want to overbear the student team.</p> <p>A longer simulation with a more definitive outcome would have helped more. Always neat to work with the mannequin. Thanks!</p> <p>It was my first time working with a simulation so I wasn't really sure what to do. The simulation, however, is a really great tool that should be definitely utilized.</p> <p>I did not learn much only because I have had to do this for my patients as a CNA.</p>
Group B (prebriefing learning-engagement and orientation activities)	<p>I really enjoyed this simulation and it helped to better know the patient stimuli that I will be working with later on.</p> <p>Thought scenario was helpful, but would have liked more time to learn more stuff.</p> <p>Being able to discuss before really helped me feel more prepared for the scenario.</p> <p>Video is kind of too fast with too much info</p>
Group C (prebriefing)	<p>With more practice I would feel more comfortable.</p> <p>More time/multiple situations with a debrief would be beneficial.</p>

Group	Comments
orientation activities only)	<p>It was helpful to know about patient in debriefing but more info on pathophysiology would be better.</p> <p>Enjoyed the simulation and scenario helpful</p> <p>It was great to get a chance to see what a simulation in the lab would look like and get a chance to assess problem with patient and not to fix it with the right interventions.</p> <p>I really enjoyed this! I think the learning technique helped us all work together and believe we all learned something through the experience.</p>
Group D (prebriefing learning-engagement activities only)	<p>I feel the simulation, well really the whole experience, could have been more profitable than it was if we had know a little more about what we were supposed to do and if we were more engaged.</p> <p>It would probably be better to run through the simulations with students who have had the material before.</p> <p>Great experience. Excellent source of information.</p> <p>Very interesting, learned a lot!</p> <p>It was helpful and beneficial. Thank you!</p> <p>Thank you, this was very helpful. Especially you getting us into a real-life situation.</p> <p>I really enjoyed the small group simulations; going over it first really helped and made me more confident.</p> <p>It was a nice little scenario</p> <p>Loved it! Very informative and educational. Thank you for your time!</p> <p>Pretty short, not sure what I was supposed to get out of this.</p> <p>Testing skills are always beneficial after a pre-conference.</p> <p>Thank you for sharing this simulation with us.</p>

Appendix I

Influence of Simulation Experience, College, and Work Experience on SET Scores

Table I1

Confidence, Learning and Overall Simulation Effectiveness Score by Simulation Experience

Scale and group	<i>df</i>	<i>MS</i>	<i>F</i>	Sig.
Confidence				
Between groups	2	20.658	2.727	.070
Within groups	116	7.575		
Learning				
Between groups	2	34.354	2.863	.061
Within groups	116	12.001		
Overall simulation effectiveness				
Between groups	2	92.729	2.750	0.68
Within groups	116	33.724		

Table I2

Confidence, Learning, and Overall Simulation Effectiveness Score by College

Scale and group	<i>df</i>	<i>MS</i>	<i>F</i>	Sig.
Confidence				
Between groups	1	0.146	0.019	.892
Within groups	117	7.862		
Learning				
Between groups	1	23.478	1.911	.169
Within groups	117	12.285		
Overall simulation effectiveness				
Between groups	1	18.080	0.519	.473
Within groups	117	34.867		

Table I3

Confidence, Learning, and Overall Simulation Effectiveness Score by Work Experience

Scale and group	<i>df</i>	<i>MS</i>	<i>F</i>	<i>Sig.</i>
Confidence				
Between groups	1	32.387	4.269	.041
Within groups	117	7.586		
Learning				
Between groups	1	21.590	1.755	.188
Within groups	117	12.301		
Overall simulation effectiveness				
Between groups	1	93.490	2.732	.101
Within groups	117	34.222		