Fall 12-5-2019

EFFECTIVENESS OF A STRUCTURED ONLINE PREBRIEFING ACTIVITY ON PRELICENSURE STUDENTS' CLINICAL JUDGMENT

Elizabeth M. Delavan
University of Texas at Tyler

EFFECTIVENESS OF A STRUCTURED ONLINE PREBRIEFING ACTIVITY ON PRELICENSURE STUDENTS' CLINICAL JUDGMENT

by

ELIZABETH M. DELAVAN

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy in Nursing
School of Nursing

Danita Alfred, Ph.D., R.N. Committee Chair

College of Nursing and Health Sciences

The University of Texas at Tyler
October 2019

The University of Texas at Tyler
Tyler, Texas

This is to certify that the Doctoral Dissertation of

ELIZABETH M. DELAVAN

Has been approved for the dissertation requirement on
October 30th, 2019
for the Ph.D. degree

Approvals:

DocuSigned by:
Danita Alfred
2048A99BB28A440...
Dissertation Chair: Danita Alfred

DocuSigned by:
Jerri Post
2157B5DC48714C9...
Member: Jerri Post

DocuSigned by:
Dr. Julie Fomenko
62FC3A1AADC4E0...
Member: Dr. Julie Fomenko

DocuSigned by:
Barbara Haas
985A922E1BF54C7...
Chair, Department of Nursing

DocuSigned by:
Yong Tai Wang
BA526018E0B84E4...
Dean, College of Nursing and Health Sciences

Acknowledgments

I would like to take this opportunity to acknowledge the faculty members, family, and friends who have supported and encouraged me throughout my doctoral journey. First, I would like to thank my committee chair, Dr. Danita Alfred. Your kindness, support, and encouragement throughout this project meant the world to me. A special thank you to my dissertation committee members, Dr. Jerry Post, and Dr. Julie Fomenko, for their encouragement, guidance, and assistance with my study. You ladies are all an inspiration to me. I would also like to thank the nursing faculty at UT-Tyler; I have learned so much from these extraordinary women. It was my privilege to be in this program.

This journey would not have been possible without the love and support of my family. I am so thankful to my parents for their endless love, support, and patience. A big thank you to my siblings, Jill and Craig, and their families for their all support and encouragement. I would also like to thank my aunt, Nancy, for her support and shared love of nursing. I have traveled this path with so many wonderful people in both the 2015 and 2016 cohorts and have been very fortunate to make lifelong friends in the process. A special thank you to my dearest friend Dinorah Martinez-Anderson, for all your support and encouragement.

A big thank you to my colleagues and friends at Texarkana College. I am so fortunate to work with such an incredible team in the Health Sciences Division.

Your support, encouragement, and willingness to help me with my study meant more than you can possibly know. A special thank you to Shannon Duke and Joan Smith, for your willingness to help me grade all those the simulations. Also, a big thank you to the first-year teaching team for all your support and help with my project. Lastly, to all my students over the last four years, thank you for all your encouragement and support, it was truly appreciated.

Table of Contents

List of Tables

Chapter 4

Abstract

EFFECTIVENESS OF A STRUCTURED ONLINE PREBRIEFING ACTIVITY ON PRELICENSURE STUDENTS' CLINICAL JUDGMENT

Elizabeth M. Delavan

Dissertation Chair: Dr. Danita Alfred Ph.D., RN.

The University of Texas at Tyler
October 2019

Prelicensure nursing programs are facing challenges that include faculty shortages and the decreasing availability of clinical sites, which is impacting their ability to prepare students for the increasingly fast-paced and complex healthcare environment. Additionally, research is demonstrating that new nurses lack clinical judgment skills. Educators are implementing simulation activities to support students' clinical learning needs. However, there is a lack of research on debriefing methodologies' contribution to the development of students' clinical reasoning abilities and clinical judgment. The first manuscript is a review of research that examined the relationship between structured debriefing and clinical reasoning. The limited number of studies indicated that students' clinical reasoning improved with structured debriefing activities.

Prelicensure nursing programs are using simulation to support clinical learning. However, the tremendous costs associated with developing simulation labs challenge many programs. The second manuscript is a grant application to build and establish a

junior college's simulation program. The college was awarded funds from the Texas Higher Education Coordinating Board that facilitated the construction of a new lab, fostering more simulation exercises. Currently, there is an abundance of research on simulation design and students' perception of simulation activities. However, prebriefing, the first stage of simulation, is understudied. The third manuscript explored the impact of a structured prebriefing exercise on prelicensure students' clinical judgment. Although the group that received the structured online prebriefing activity scored higher than the control group, no significant differences were noted. The multi-faceted relationship between clinical judgment and simulation is complicated; more studies are needed to understand this relationship better.

Chapter One

Overview of the Program of Research

Nursing programs have been using simulation-based activities as a teaching strategy for over 100 years. In 1910, a full-size static mannequin with realistic structures, including jointed hips elbows and knees called Mrs. Chase, was used to train nurses at Hartford Hospital in Connecticut (Nickerson & Pollard, 2010). The simulator was used to help students develop their practical skills prior to utilizing them in the hospital setting. Mrs. Chase mannequins were used until the 1950s and received several upgrades over time, including an arm that was used for injection practice (Sanko, 2017). The modern-day use of simulation began in the 1960s when the Laerdal company developed the Resusci Anne mannequin that had internal lungs and a spring for cardiopulmonary resuscitation teaching (Nickerson & Pollard, 2010). Since that time, technology has made tremendous advancements, and more sophisticated computerized simulators have been developed with life-like features and abilities.

Simulation is comprised of three phases: prebriefing, an interactive scenario, and debriefing. One of the benefits of using simulation is that it allows students to provide care to specific and unique patient scenarios that may be difficult to obtain in a traditional clinical environment. Nursing programs began to use human patient simulators in the mid-1990s (Sanko, 2017). However, it was not until 10 years later, that simulation became more widely accepted as an effective teaching strategy (Aebersold & Tschannen,

2013). According to the National Council State Board of Nursing (NCSBN) simulation survey (2017), 91% of associate degree and 89% of baccalaureate programs who responded to the survey are using high-fidelity and or computer-based simulation experiences to teach clinical skills (Smiley, 2019).

Nursing research initially focused on simulation design, students' perceptions of the simulation experience, and debriefing methodologies (Kardong-Edgren & Fey, 2017). However, with the increasing calls for nursing education to improve the link between education and practice, simulation research has expanded (Benner, Sutphen, Leonard & Day, 2010; International Nursing Association for Clinical Simulation (INACSL), 2018; National League for Nursing (NLN), 2015). Many aspects of simulation require additional research; these include prebriefing, the first stage of the simulation process, the use of virtual simulation, reliability, and validity testing of simulation grading instruments and the use of simulation for clinical competency evaluations. The purpose of this program of research was to explore the structured aspects of prebriefing and debriefing activities on students' clinical reasoning and judgment. The aim was to fill these gaps in simulation research and disseminate the findings to nursing colleagues through professional publications.

Introduction of Articles and Grant Application

The research presented in this portfolio began with an article that reviewed research which explored the relationship between structured debriefing and clinical reasoning development in nursing students. Clinical reasoning is defined as the cognitive process that includes the collection and analysis of data to identify health problems or concerns (Benner, Sutphen, Leonard, & Day, 2010; Dreifuerst, 2012: Jenson, 2013).

Nursing researchers and organizations have reported a lack of adequate clinical reasoning and judgment in new nurses (del Bueno, 2005; Cooper et al., 2009; Hart et al., 2014: National League for Nursing (NLN), 2015). Nurses who do not have strong clinical reasoning and judgment can fail to notice and address changes in a patient's health status, which contributes to poor patient outcomes (Benner et al., 2010; Lapkin, Levett-Jones, Bellchambers, & Fernandez, 2010). Nursing educators are using simulation-based learning experiences to develop students' clinical reasoning and prepare them for the practice environment. According to INACSL Best Practice Standards (2016), the debriefing session that follows participating in a simulation scenario is designed to promote a reflective approach to students' learning, that is critical in fostering new knowledge, skills, and attitudes. Nursing research indicates that a structured debriefing session is essential to students learning (American Associate of Colleges of Nursing (AACN), 2008; Dreifuerst, 2012; Forneris et al., 2015; NLN, 2015: Neil & Wooten, 2011). However, only a small number of studies have been conducted to explore the relationship between structured debriefing and clinical reasoning development in students. A review article was written to explore nursing knowledge on this topic and identify debriefing methods that contribute to student learning.

The second chapter is a grant application. The Texas Higher Educating Coordinating Board (THECB) directs the Nursing Innovation grant program that provides funds to nursing programs across Texas to support a variety of educational goals. The application submitted was for the Building of Simulation and Skill Labs Capacity grant. The purpose of this grant was to assist programs in developing new simulation labs and programs to support students' clinical learning. The primary objectives of the grant

application, for a junior college, were to increase the number of simulation hours in five clinical courses, facilitate the nursing faculty's understanding of simulation methodologies, and best practices and increase students' knowledge of clinical concepts. The grant application contained a timeline for implementation, methods for evaluation, and budget for equipment and training. The junior college was awarded the THECB Nursing Innovation grant in August of 2017 (see Appendix B).

The first manuscript examined structured debriefing methods and the importance of reflective teaching practices for fostering students' clinical reasoning, and the second manuscript was a grant application for building simulation labs and activities; however, prebriefing, the first stage of the simulation was not addressed in either chapter. According to nursing researchers, there is very little information about prebriefing exercises and their contributions to students' learning (Chamberlain, 2015; Fanning & Gaba, 2007; INACSL, 2018; Leigh & Stuben, 2018; McDermott, 2016; Page-Cutrara, 2014; Sharoff, 2015). Therefore, the final manuscript focused on prebriefing and explored the effectiveness of a structured online prebriefing activity on nursing students' clinical judgment.

Prebriefing is described as the preparatory exercises and content that are provided in advance of simulation activities and are designed to optimize students' simulation learning experiences (Tyerman, Luctkar-Flude, Graham, Coffey, & Olsen-Lynch, 2019). According to INACSL Best Practices for Simulation (2016), prebriefing should include pre-simulation assignments, outlines of learning objectives, directions that clarify expectations, and orientation to the lab and equipment. Prebriefing offers educators

another setting to develop prelicensure students' clinical judgment, a skill that is essential in today's healthcare environment.

A quasi-experimental randomized group design was used to compare the impact of a structured online prebriefing exercise to traditional face to face prebriefing exercises. The study used a convenience sample of associate degree nursing students at a junior college in North-East, Texas, who participated in simulation exercises regarding the care of the patient with vascular insufficiency. Descriptive and inferential statistical tests were used to describe and analyze the data. In addition, qualitative data was collected and grouped according to themes related to students' perceptions of the prebriefing exercises. Strengths, limitations, future recommendations, and a summary were also provided.

Chapter Two

Fostering Clinical Reasoning through Structured Debriefing Exercises

Abstract

The decreasing availability of clinical sites and faculty shortages continues to challenge nursing programs across the United States. To combat these problems, nursing schools are utilizing simulation activities in the place of traditional clinical experiences. Nursing research supports simulation-based learning as an active and collaborative teaching methodology. The debriefing session that follows the simulated learning experience conducted by trained faculty has been identified as a critical facilitator of the participants' learning. However, very few studies have examined the effectiveness of debriefing activities on students' clinical reasoning development. The purpose of this manuscript is to provide a review of current research exploring the relationship between structured debriefing activities and clinical reasoning.

For the past several years, nursing research has identified a lack of adequate clinical reasoning abilities in graduate nurses (del Bueno, 2005; Cooper et al., 2009; Endacott et al., 2010; Hart et al., 2014). Nurses who do not have adequate clinical reasonings can fail to detect changes in their patient's health status, which can lead to compromises in patient's safety and 'failure to rescue' deteriorating patients (Benner, Sutphen, Leonard, & Day, 2010; Lapkin, Levett-Jones, Bellchanbers, & Fernandez, 2010). Ideally, nursing students develop their clinical reasoning abilities in the healthcare environment, working alongside practicing nurses. This hands-on learning approach assists students in making connections between theoretical knowledge and the clinical setting. However, the increasingly complex and chaotic acute care setting and the shortage of clinical spaces creates barriers to students' clinical reasoning development (Cappelletti, Engel, & Prentice, 2014; Lapkin et al., 2010). These restrictions create time limits for clinical instructors, which may impair their ability to help students work through patient problems and determine the most appropriate interventions to implement (Lapkin et al., 2010). As a result, pre-licensure nursing programs are utilizing simulation, especially structured debriefing methods to foster student's clinical reasoning abilities.

Background

Both the National League for Nursing (NLN, 2015) and the American Association of Colleges of Nursing (AACN, 2018) support the use of simulation activities in pre-licensure nursing education. The simulation process includes pre-briefing or preparatory exercises followed by an active simulation scenario and then a debriefing session. Debriefing methodologies have been identified by nursing researchers and the International Nursing Association for Clinical Simulation and Learning (INACSL, 2016)

as a critical component of participants learning (Dreifuerst, 2012; Fanning & Gaba, 2007; Shinnick, Woo, Horwich, & Steadman, 2011). Debriefing is often described as a period of guided reflection that provides opportunities for the assimilation of knowledge, skills, and behaviors (INACSL, 2016). The process of debriefing is expected to assist the participants in fostering new clinical knowledge and reasoning abilities that are needed in the modern healthcare setting. There is a body of research that speaks to the effectiveness of structured debriefing in promoting students' clinical reasoning abilities. This manuscript will review the concepts of clinical reasoning and debriefing and then examine current research.

Clinical Reasoning

Nurses and nursing scholars have used the terms clinical reasoning and clinical judgment interchangeably. Clinical reasoning is defined as a cognitive process that includes collection and analyses of patient data to identify actual and potential health problems (Benner et al., 2010; Dreifuerst, 2012; Forsberg et al., 2011; Jensen, 2013). This process is cyclic in nature, as nurses continually use clinical reasoning to assess and reassess their patients' health status. A nurse's ability to clinically reason has been shown to contribute to high-quality patient care, improvements in patient safety and positive patient outcomes, making it essential in the modern healthcare environment (Benner et al., 2010; Mariani, Cantrell, Meakim, Prieto, & Dreifuerst, 2013).

Clinical judgment is often referred to as the decision-making process that occurs after a nurse has 'reasoned' through data about a patient's health status (Tanner, 2006). It is a systematic method that nurses use to make determinations about which actions to implement in the care of a patient and can be measured by tools such as the Lasater

Clinical Judgment Rubric (LCJR) (Victor-Chmil, 2013). However, nurses often intertwine clinical reasoning and clinical judgment as they repeatedly collect and analyze data and then execute appropriate nursing actions throughout the day to improve and/or help manage a patients' health status.

Importance of Debriefing

Simulation exercises offer nursing students the opportunity to develop and practice their clinical reasoning abilities without real-life consequences. According to INACSL (2016), the debriefing phase of simulation promotes a reflective approach to learning that is critical to fostering participants' understanding of the simulation experience. The process of reflection and guided discussion provides students the opportunity to link theoretical knowledge, practical skills, and decision-making to the clinical setting, which contributes to students' clinical reasoning development (NLN, 2015). According to Dreifuerst (2009), learner-focused debriefing sessions facilitated by trained faculty can assist all students engaged in the debriefing to reexamine the simulation scenario using clinical reasoning to learn reflective practice techniques and receive feedback about their performance.

A study on the relationship between debriefing and student learning by Shinnick et al. (2011) focused on where the most significant knowledge gains take place in the simulation process. The researchers conducted a pretest on all students regarding heart failure. The sample was then divided into two groups. The first group participated in the simulation scenario about caring for a patient with heart failure and then took a posttest. The second team engaged in the same simulation, followed by faculty-led debriefing before taking the posttest. One instructor conducted the debriefing sessions using guided

reflection to encourage the students to examine and reflect on the simulation scenario. The researchers did not articulate if the instructor who led the debriefing session had any formal training. At the end of all the simulation exercises, the entire sample received one final posttest on heart failure. The results demonstrated that the students who participated in the simulation and faculty-led debriefing experienced higher scores on the posttest (n = 90, *M* = 72) than their counterparts (n = 72, *M* = 69) (see Appendix L). This study provides some evidence that the most significant knowledge gains may occur after the debriefing session (Shinnick et al., 2011). Nursing researchers have built upon this study to examine the impact of structured debriefing on students' learning.

Body of Evidence

A search of the nursing literature 2007 – 2017 using the keywords structured debriefing, clinical reasoning, and prelicensure nursing students revealed five research articles that examined the impact of structured debriefing on undergraduate nursing students' clinical reasoning abilities (see Appendix L). Clinical reasoning is a cognitive process, and currently, nursing researchers do not have a tool that can objectively measure students' reasoning abilities (Driefuerst, 2012; Forneris et al., 2015). As a surrogate measure, nursing scholars have utilized the Lasater Clinical Judgment Rubric (LCJR), which has a clinical judgment subscale, and the Health Sciences Reasoning Test (HSRT) to examine students' reasoning abilities. This manuscript will discuss these two instruments and their use in clinical reasoning research.

Early Instrument Development

Lasater (2007) recognized that simulation offered nursing educators a vehicle for teaching and evaluating the clinical judgment of prelicensure nursing students in a safe

environment. Prior to 2007, the only tool available to nurse educators that examined clinical judgment was a self-reporting instrument. It was developed by Jenkins (1985) and asked participants to identify strategies used to make clinical decisions (Lasater, 2007). Nurses, especially new nurses, need to demonstrate strong clinical reasoning and judgment skills in the modern healthcare environment. From this identified need, the Lasater Clinical Judgment Rubric (LCJR) was developed. The LCJR reflects Tanner's (2006) model of clinical judgment, which includes concepts of noticing, interpreting, responding, and reflecting. The rubric contains 11 dimensions that include focused observations, recognizing deviations from expected patterns, information seeking, prioritizing data, and making sense of data. These categories within the rubric reflect several aspects of clinical reasoning. The dimensions of the LCJR are scored at four developmental levels; exemplary, accomplished, developing, and beginning.

Lasater (2007) initially tested this rubric by evaluating the clinical judgment of 26 students who were assigned the role of a primary nurse in a high fidelity simulation (HFS). The initial results of the LCJR demonstrated a mean of 22.98 points out of a maximum of 44 (SD = 6.07) (Lasater, 2007) (see Appendix L). The rubric has limitations that include variability among users in terms of the language used to describe the developmental levels. Educators who chose to use this rubric will need to conduct inter-rater reliability to ensure consistent scoring. The rubric was designed for a single simulation experience. However, it can be used to assess students' clinical reasoning/judgment and then reassess at a later date to evaluate their growth.

Instrument development was the focus of Lasater's research in 2007. This theory-based tool has provided nursing educators with a method to measure clinical judgment in

prelicensure nursing students and defines performance standards for both faculty and students. Since 2007, nursing has teased out the definition of clinical reasoning from clinical judgment. Clinical reasoning is now considered to be the cognitive process of gathering and analyzing clinical information. Clinical judgment is the process whereby nurses respond to the data collected and analyzed in the clinical reasoning to make a decision about about patient care, and implement the most appropriate nursing actions The LCJR is a suitable tool for nurse educators to use to help to identify clinical reasoning/judgment skill gaps in students that may have been more challenging to detect in a traditional clinical environment (Lasater, 2007).

Structured Debriefing and the LCJR

In the last ten years nursing research in simulation has rapidly grown, specifically in the area of debriefing. Researchers have used the LCJR to examine the impact of debriefing on student learning. Mariani et al. (2013) used LCJR to compare the effect of post-HFS structured and unstructured debriefing on students' clinical judgment scores. The researchers stated that the terms of clinical judgment and clinical reasoning are interchangeable, as reasoning effects judgment and judgment impacts reasoning and used both terms throughout the article (Mariani et al., 2013). The students in this study participated in two simulations, one at mid-term, and second at the end of the semester. A trained facilitator conducted the debriefing sessions for the structured debriefing group using the Debriefing for Meaningful Learning (DML) method. The researchers used a repeated-measures analysis of variance (RM-ANOVA) to assess the difference between the two groups and within the groups. The intervention group demonstrated improvements in their LCJR overall, F (1,84) = 0.009, p = .92 (see Appendix L).

However, the total scores and the subscale scores from the LCJR between the intervention and control groups were not statistically significant. The researchers noted that this lack of statistical significance could be due to the small sample size (n=86). The researchers also noted that the LCJR score was determined by the student's faculty member during the first simulation and by the researcher team during the second simulation, which raises the question of inter-rater reliability.

Mariani et al. (2013) also conducted a focus group interview with students from both the intervention and control groups after the second simulation. The students were asked by researchers to discuss their perceptions of the debriefing process, such as 'what were some of the positive and negative aspects of the debriefing' and 'can you describe any changes you will make in your clinical judgments or behaviors in future clinical experiences' (Mariani et al., 2013). The students who participated in the structured debriefing session perceived that the DML approach fostered more student-focused learning in comparison to the students in the control group who felt the debriefing focused on their errors. Despite the lack of statistical significance, this study offers preliminary support for the use of the DML approach to theory-based structured debriefing for improving students' clinical reasoning abilities. However, Lasaters (2007) and Mariani et al. (2013) demonstrate the need for additional research on the use of the LCJR's as an instrument and its ability to detect changes in students' clinical reasoning abilities.

Structured Debriefing and the HRST

Two nursing studies have examined the impact of structured debriefing on students' clinical reasoning abilities using the Health Sciences Reasoning Test (HSRT) to

measure change. The HRST is a copyrighted instrument that was developed by Insight Assessment. This test consists of 50 multiple choice questions that ask students to draw inferences, make interpretations, analyze information, and identify reasoning (Forneris et al., 2015). This instrument will report overall reasoning scores as well as subscores for analysis, evaluation, and inferences, as well as inductive and deductive reasoning. Driefuerst (2012) noted that reliability for the HRST was established using a Kuder-Richarson 20 calculation for multidimensional scales and was estimated at 0.81 (n=444). The HRST is not unique to nursing and is used to assess the clinical reasoning abilities of both graduate and undergraduate trainees in several healthcare fields. Therefore, nursing researchers and scholars should take this into consideration when examining study outcomes.

Dreifuerst's (2012), study examined the effect of the DML on students' clinical reasoning abilities in a randomized control study. Participating students (n=238) were randomly assigned to the intervention or control group. After the simulation scenario, the intervention group participated in a debriefing exercise with the researcher who facilitated the session using the DML method. The control group received the usual or unstructured debriefing session with a clinical instructor. All students completed the HRST three weeks prior to the simulation and again with an alternative HSRT three weeks after the simulation activity. Students who were debriefed using the DML method scored significantly higher, (n = 122, M = 24.3, SD = 5.3) than those that received an unstructured debriefing, (n = 116, M = 23.9, SD = 5.3) (see Appendix L). Forneris et al. (2015) replicated this study using a multisite approach and found significant improvements in pretest-posttest scores with the DML method. The intervention group

posttest scores (n = 78, M = 23.56, SD = 3.9) were higher than control group scores (n = 75, m = 22.41, SD = 4.6) (see Appendix L). The results of these two studies offer preliminary support for the use of structured debriefing methods in improving students' clinical reasoning abilities.

Implications for Nursing Education

Simulation activities contribute to student-focused clinical learning opportunities for pre-licensure nursing students. Nursing organizations that support simulation exercises in nursing curriculums include the NLN, the AACN, the National Council State Board of Nursing (NCSBN), and INACSL. The NLN, in collaboration with INACSL, published a white paper. This white paper titled "Debriefing Across the Curriculum" states, "debriefing is an essential methodology to fully promote thinking along a continuum from 'knowing what' to 'knowing how' and 'knowing why' (N LN, 2015, p.2). The research studies by Dreifuerst (2012), Forneris et al. (2015), and Mariani et al. (2013) offer beginning support for theory-based structured debriefing practices and their impact on students' clinical reasoning development.

Implications for Future Research

Mariani et al. (2013) and Lasater (2007) noted that additional research into the sensitivity of LCJR is needed to ensure that students' subtle gains in their perceived self-confidence with reasoning skills are being captured. The researchers of the studies that utilized the HSRT test for examining students' clinical reasoning all noted that this standardized test is not nursing focused and may not adequately assess the prelicensure students' clinical reasoning (Dreifuerst, 2012; Forneris et al., 2015; Shinnick & Woo,

2013). Further development of instruments to effectively measure prelicensure nursing students' clinical reasoning abilities are needed.

Forneris et al. (2015) conducted a multi-site study that improves the generalizability of the study's results, an essential consideration for nursing education and research. However, the limited number of studies on clinical reasoning with prelicensure nursing students suggests the need for further research with larger samples and different settings to better nursing's understanding of how structured debriefing impacts clinical reasoning.

Conclusion

Clinical reasoning is the cognitive process that nurses use to gather and analyze data about the patient's current health status. Clinical judgment is the decision-making aspect of the patient's plan of care that occurs once the nurse has examined the patient's current data and all possible options for care. Clinical reasoning and clinical judgment are two pieces of an intellectual system employed every day by nurses to provide high-quality patient care. This is a skill that every nurse must have in the modern healthcare environment.

Simulation has become an essential part of nursing education and is one strategy that is being used to teach clinical reasoning. Simulation activities can expose students to specific, controlled, and unique learning opportunities that can be challenging to obtain in a traditional clinical setting. Several studies, systematic reviews, and nursing organizations support structured debriefing as an essential part of the learner's experience with simulation (AACN, 2008; INASCL, 2016; NLN, 2015; Dreifuerst, 2012; Forneris et al., 2015; Neil & Wooten, 2011; Shinnick et al., 2011).

A small number of studies have demonstrated improvements in students' clinical reasoning abilities with structured debriefing activities. The fast pace of the modern healthcare environment requires new nurses to have strong clinical reasoning abilities (Benner et al., 2010). Further research examining the effectiveness of structured debriefing in fostering student clinical reasoning abilities will contribute to the growing body of nursing knowledge and assist in students' readiness as they transition to real-world practice.

References

American Association of Colleges of Nursing. (2008). Baccalaureate essentials. Retrieved from http://www.aacnnursing.org/Education-Resources/AACN-Essentials

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

Cappelletti, A., Engel, J.K., & Prentice, D. (2014). Systematic review of clinical judgment and reasoning in nursing. *Journal of Nursing Education, 53*(8), 453 – 458. doi: 2048/10.3928/01484834-20140727-01

Cooper, S., Cant, R., Porter, J., Sellick, K., Somers, G., Kinsman, L., & Nestel, D. (2010). Rating medical emergency teamwork performance: Development of the team emergency assessment measure (TEAM). *Resuscitation, 81*(4), 446 – 452. doi: 2048/10.1016/j.resuscitation.2009.11.027

del Bueno, D. (2005). A crisis in critical thinking. *Nursing Education Perspectives, 26*(5), 278 – 283. doi: 10.1043/1536-5026

Dreifuerst, K.T. (2009). The essentials of debriefing in simulation learning: A concept analysis. *Nursing Education Perspectives, 30*(2), 109 – 114.

Dreifuerst, K.T. (2012). Using debriefing for meaningful learning to foster the development of clinical reasoning in simulation. *Journal of Nursing Education, 51*(6), 326 – 333. doi: 10.3928/01484834-20120409-02

Endacott, R., Scholes, J., Buykx, P., Cooper, S., Kensmann, L., & McConnell-Henry, T. (2010). Final year nursing students' ability to assess, detect, and act on clinical cues of deterioration in a simulated environment. *Journal of Advanced Nursing, 66*(12), 2722 – 2731. doi: 10.1111/j.1365-2648.2010.05417.x

Fanning, R.M., & Gaba, D.M. (2007). The role of debriefing in simulation-based learning. *Simulation in Healthcare, 2*(1), 115 – 125. doi:10.1097/SIH.0b.013e3180315539

Forsberg E., Georg, C., Ziegert, K., & Fors, U. (2011). Virtual patients for assessment of clinical reasoning in nursing – A pilot study. *Nursing Education Today, 31*(8), 757 – 762. doi: 10.1016/j.nedt.2010.11.015

Forneris, S.G., Neal, D.O., Tiffany, J., Kuehn, M.B., Meyer, H.M., Blazovich, L.M., Holland, A.E., & Smerillo, M. (2015). Enhancing clinical reasoning through simulation debriefing: A multisite study. *Nursing Education Perspectives, 36*(5), 304-310. doi:10.5480/15-1672

Hart, P.L., Brannan, J.D., Long, J.M., Maguire, M.R., Brooks, R.K., & Robley, L.R. (2014). Effectiveness of a structured curriculum focused on recognition and response to acute patient deterioration in an undergraduate BSN program. *Nurse Education in Practice, 14*(1), 30 – 36. doi: 10.1016/j.nepr.2013.06.010

International Nursing Association for Clinical Simulation and Learning. (2016). Standards of best practice: Debriefing. Retrieved from https://www.inacsl.org/i4a/pages/index.cfm?pageID=3407

International Nursing Association for Clinical Simulation and Learning. (2016). INACSL standards of best practice: Simulation debriefing. *Clinical Simulation in Nursing 12,* S21-S25. doi: 10.1016/j.ecns.2016.09.008

Jenson, R. (2013). Clinical reasoning during simulation: Comparison of student and faculty ratings. *Nursing Education in Practice, 13*(1), 23 - 28. doi: 10.1016/j.nepr.2012.07.001

Lapkin, S., Levett-Jones, T., Bellchanbers, H., & Fernandez, R. (2010). Effectiveness of patient simulation manikins in teaching clinical reasoning skills to undergraduate nursing students: A systematic review. *Clinical Simulation in Nursing, 6*(6), e207-e222. doi: 10,1016/j.ens.2010.05.005

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

Mariani, B., Cantrell, M.A., Meakim, C., Prieto, P., & Dreifuerst, K.T. (2013). Structured debriefing and students' clinical judgment abilities in simulation. *Clinical Simulation in Nursing, 9*, e 147 – e155. doi: 10.1016/j.ecns.2011.11.009

National League for Nursing. (2015) Debriefing across the curriculum. Retrieved from http://www.nln.org/docs/default-source/about/nln-vision-series-(position-statements)/nln-vision-debriefing-across-the-curriculum.pdf?sfvrsn=0

National League for Nursing. (2015). A Vision for Teaching Simulation. Retrieved from http://www.nln.org/docs/default-source/about/nln-vision-series-(position-statements)/vision-statement-a-vision-for-teaching-with-simulation.pdf?sfvrsn=2

Neill, M.A., & Wotton, K. (2011). High - fidelity simulation debriefing in nursing education: A literature review. *Clinical Simulation in Nursing, 7*(5), e161 – e168. doi: 10.1016/j.ecns.2011.02.001

Shinnick, M.A., Woo, M., Horwich, T.B., & Steadman, R. (2011). Debriefing: The most important component in simulation? *Clinical Simulation in Nursing, 7*(3), e105 – e111. doi: 10.1016/j.ecns.2010.11.005

Shinnick, M.A., & Woo, M.A. (2013). The effect of human patient simulation on critical thinking and its predictors in prelicensure nursing students. *Nurse Education Today, 33,* 1062-1067. doi: 10.1016/j.nedt.2012.04.004

Tanner, C.A. (2006). Thinking like a nurse: A research-based model of clinical judgment in nursing. *Journal of Nursing Education, 45*(6), 204 – 211.

Victor-Chmil, J. (2013). Critical thinking versus clinical reasoning versus clinical judgment: Differential diagnosis. *Nurse Educator, 38*(1), 34 – 36. doi: 10.1097/NNE.0b013e318276dfbe

Chapter Three

Grant Application: Texas Higher Education Coordinating Board

Nursing Innovation Grant: Building Simulation and Skills Lab Capacity

TEXAS HIGHER EDUCATION COORDINATING BOARD

Nursing Innovation Grant Program

2017-2018

Building Simulation and Skills Lab Capacity

INQUIRY DEADLINE: 5:00 p.m. CDT, August 2, 2016

APPLICATION DEADLINE: 5:00 p.m. CDT, August 15, 2016

Cover Page

Applicant Institution: Texarkana College
2500 N Robison Rd Texarkana Texas 75599

Current Approval Status from Texas Board of Nursing for the Initial RN Licensure Program:
Full Approval with Warning

Total NIGP Funding Requested for 24-month Period Ending 12/31/2018 (up to $200,000):
$ 179, 233.00

Year 1 Funding Request (approximately 1/1/2017-12/31/2017):	Year 2 Funding Request (1/1/2018-12/31/2018):
167, 988.00	$ 11, 245.00

Contact Information and Signatures

Project Director's Name (typed): Elizabeth Delavan, MSN, RN.	Co-Project Director's Name (from same institution): Courtney Shoalmire, MSN, RN
Phone: (903) 823 - 3407 Email Address: Elizabeth.delavan@texarkanacollege.edu Mailing Address: 2500 N Robison Rd Texarkana Texas 75599	Phone: (903) 823 - 3401 Email Address: Courtney.Shoalmire@texarkanacollege.edu Mailing Address: 2500 N Robison Rd Texarkana Texas 75599
_____ Project Director Signature	_____ Co-Project Director Signature

Contact Person's Name and Title at Office of Sponsored Projects (typed): Courtney Shoalmire MSN RN

Telephone number/email: (903) 823 – 3401; Courtney.shoalmire@texarkanacollege.edu

Mailing Address:2500 N Robison Rd, Texarkana TX 75599

Contact Person's Name and Title at Office of Sponsored Projects (typed): Courtney Shoalmire MSN RN

Telephone number/email: (903) 823 – 3401; Courtney.shoalmire@texarkanacollege.edu

Mailing Address:2500 N Robison Rd, Texarkana TX 75599

Authorized Institutional Representative's Name and Title (typed):

Donna McDaniel, Ph.D.
Vice President of Instruction, Texarkana College

I certify that the statements herein are true, complete, and accurate to the best of my knowledge. I further certify that if NIGP program funds are awarded, this institution accepts the obligation to comply with terms and conditions set by the Texas Higher Education Coordinating Board.

_____ _____
Authorized Institutional Representative Signature Date

Project Narrative

Project Scope and Description

Texarkana College (TC), Associate Degree Nursing program, was established in 1959, and since that time has graduated over 4,000 nurses. The program is the leading educator of Registered Nurses in the region, graduating approximately 80 nurses each year who provide high-quality patient care throughout North East Texas. The TC nursing program is increasing the amount of patient care simulation in the curriculum to improve student success. Simulation is paired with active teaching and learning strategies in the skills and simulation labs. This approach to learning is designed to meet the needs of today's students by improving their clinical competency and reasoning skills.

In 2014, The National Council of State Board of Nursing (NCSBN) published the results of their research study on the use of simulation in prelicensure nursing programs. The study found that well planned and executed clinical simulation is effective in teaching clinical competency and critical thinking and can account for up to 50% of clinical learning experiences (Hayden, Jeffries & Kardong-Edgren, 2014). The NCSBN research findings are significant to Texarkana College as the nursing program is faced with the challenge of decreasing clinical spaces for students and increased competition from other nearby programs.

In 2014, Texarkana College acquired two high fidelity patient simulators through the Health Professions Pathways (H2P) TAACCCT round one grant. With 2015-2016 NIGP grant funds, Texarkana College constructed two simulated hospital rooms with audio-visual equipment for the simulators and also purchased a SimJunior pediatric simulator. Texarkana College was recently awarded a Jobs and Education for Texans

(JET) grant with which a SimMom birthing simulator, a SimNewB infant simulator, will be purchased. The 2017-2018 NIGP grant will allow for the construction of labor and delivery simulation room for SimMom as well as rooms for the SimJunior and SimNewB. Women's health, obstetrics, and pediatrics are among the most limited clinical spaces. The ability to effectively incorporate simulation in these patient care specialties will better prepare students for employment.

The Texarkana College nursing program also uses low and mid-fidelity simulation and task trainers in three skills labs for teaching and learning experiences. Mid-fidelity simulation includes the use of standardized patients, computer programs, and video games for teaching purposes. Low-fidelity simulation involves role-play, non-computerized manikins, and task trainers. A task trainer is a simulator used to practice a specific skill such as tracheostomy care or urinary catheter insertion (Aebersold & Tschannen, 2013). The skills labs where low and mid-fidelity simulation is used are not equipped with privacy curtains or headwall units. The lack of privacy and replicated hospital equipment decreases the realization of simulation activities. Aebersold and Tschannen (2013) reviewed multiple research studies on simulation and found that simulation activities positively impact patient outcomes and self-assessment and promote a culture of safe care. Realistic simulation settings will positively impact the learning environment and student outcomes. The 2017-2018 NIGP grant will allow for the skills lab to be upgraded with headwalls, privacy curtains, and more high-fidelity patient simulators (i.e., Nursing Anne), task trainers, simulation software, and other equipment. The newly acquired equipment will be used for teaching medical-surgical, pediatric, and women's health nursing skills and will help facilitate student thinking and learning.

The Associate Degree Nursing program employs fourteen full-time educators who teach theory courses and clinical learning experiences, including simulation. Many of the faculty have participated in introductory training on using the high-fidelity patient simulators. NIGP funds will enable Texarkana College to provide further training for the nursing faculty on patient simulators, thereby increasing the program's ability to shift traditional clinical hours to simulation-based learning activities. Other grant funds would be used to send faculty members to conferences with skills and simulation foci.

Project Goals

1. Shift traditional patient care clinical hours to simulation-based learning activities for students. Texarkana College will transform a classroom into a simulation lab with three hospital rooms. The renovation will provide a realistic learning environment where group and individual simulation activities will take place. Further, to increase simulation capacity and increase realism, Texarkana College will upgrade the skills labs by adding privacy curtains, headwall units, more high-fidelity simulators, and other equipment to assist the faculty in implementing new simulation activities.
2. Increase student readiness for clinical practice by adding new simulation exercises to the curriculum. Simulation activities provide a safe learning environment for students to develop both their practical skills and their clinical reasoning abilities, which are essential for real-world clinical practice. Grant funds will be used to purchase equipment that will allow for head-to-toe physical assessments using simulators and teaching wound care skills using simulation. Also, new task trainers for teaching tracheostomy care will improve how this skill is taught to

students and their ability to give a return demonstration. According to Jeffries (2016), research studies support the use of simulation activities as a methodology for developing students' clinical reasoning and practical skills.

3. Increase faculty ability to conduct simulation and improve teaching ability through professional development. Increasing faculty competencies in simulation development and implementation will allow the advancement of hands-on learning exercises for students. These activities will provide students with learning opportunities that they may not receive in the traditional clinical setting. One faculty member will be sent to each of the following conferences:
   - International Nursing Association for Clinical Simulation & Learning, June 21-24, 2017, Washington, D.C. Each year this conference provides nurse educators the best setting for gaining current best practice and innovations in skills and simulation lab management and education.
   - Nurse Educator Conference in the Rockies, July 13-17, 2017, Breckenridge, CO. This conference promotes the use of technology in the classroom and skills/simulation labs with a focus on improving student critical thinking and clinical reasoning skills and curriculum design.
   - NLN Education Summit, September 14-16, 2017, San Diego, CA. The 2017 conference is geared towards "descriptive, how-to sessions for educators who want to improve their teaching skills, integrate innovative methodologies, and/or investigate creative opportunities for clinical learning" (NLN, 2016).
   - NLN Education Summit, September 12-15, 2018, Chicago, IL. Information about this conference has not been made public yet. The NLN is a leader in

nursing education, and the NLN Education Summit is sure to be beneficial for faculty.

4. Decrease the total number of patient care clinical contact hours of instruction and increase the number of simulation-based learning hours in all clinical courses. By increasing the college's capacity for simulation activities, transforming the skill labs into spaces for simulation-based learning activities and increasing the number of faculty who are proficient in simulation, TC will create an environment which allows for a decrease in the total number of traditional clinical contact hours and an increase in the number of simulation-based learning exercises in clinical courses throughout the curriculum.

Implementation Methodology

Simulation activities provide students with the opportunity for hands-on clinical education. These activities can be focused to meet the specific learning objectives in clinical courses, which enhance student readiness for clinical practice. The first goal of this project is to shift traditional patient care clinical hours to simulation activities. Transforming a classroom into three hospital rooms for simulation will provide a realistic setting for simulation activities. The high fidelity simulations being acquired through a JET grant and new simulators purchased with funds from this grant would be used in the new simulation rooms. With increased simulation capacity, more clinical hours can be shifted to simulation from traditional clinical experiences. Adding headwalls and privacy curtains and replacing the carpet with vinyl flooring will make the existing skills labs for realistic for simulation using task trainers and simulators. Changes made to these spaces will support faculty in the development and implementation of new simulation activities

in clinical courses. Some of these activities will include new wound care and assessment exercises and increase opportunities to master skills such as vital signs and the insertion and care of indwelling urinary catheters.

Grant funds will be used to purchase patient simulators and software programs. The new software will assist faculty in the development and implementation of simulation scenarios for training students in labor and delivery, post-partum care, and care of the newborn. Other simulation software will focus on acid-base imbalances, complicated gastrointestinal problems, and clinical reasoning skills. These new scenarios, along with others, will support students in being better prepared for the modern healthcare system. A blueprint of simulation activities is outlined in the Timeline section of this application.

Grant funds will be used to send faculty members to conferences to learn the newest information about simulation-based learning in nursing and other best practices in nursing education. The faculty members who will attend these conferences will share their new knowledge with all the faculty in the Health Sciences Department. A second strategy to improve the educator's ability to provide simulation will be to bring patient simulator training to the campus. Teaching the faculty how to control the patient simulators and new techniques for achieving high-quality simulation will create an environment that supports student learning outcomes. Grant funds will also be used to purchase software for patient simulators. Upgrading current software for patient simulators will facilitate faculty proficiency with simulation development and implementation.

Project Evaluation

The Associate Degree Nursing program will utilize a process of formative and summative evaluation to determine how the project goals are being met. Project Directors will collect data at regular intervals to monitor grant objectives. Data collection for the shifting of traditional patient care clinical hours will include monitoring the number of traditional clinical hours and simulation hours in clinical course RNSG 1360 and the number of new simulation activities implemented in all clinical courses.

To evaluate the project goal of enhancing student readiness for hands-on patient care, the project directors will gather data on student clinical competencies. Educators will assess students' abilities to provide excellent return demonstrations in the following clinical courses: (1) RNSG 1360, insertion of indwelling urinary catheters, (2) RNSG 1260, insertion of IV catheters and (3) RNSG 2360, wound dressing changes and tracheostomy care. Simulation of these essential clinical skills is critical as students must be prepared for modern clinical practice settings. It will also provide a performance measure to determine if increasing the number of simulations is improving students' readiness for practice.

Project Directors will monitor the total number of clinical instruction hours in the Associate Degree Nursing program. Currently, ADN students spend 738 hours in the traditional clinical setting and 66 hours in the simulation lab. With the implementation of this grant, the total number of traditional clinical contact hours will be reduced as the faculty implements new simulation activities. Renovations to the simulation and skills labs, new equipment purchases, and faculty training will allow faculty to develop and

implement new simulation exercises. These improvements will increase the number of simulation hours and decrease the total number of traditional patient care hours.

The last goal of the project is to increase the faculty's ability to conduct simulation activities. The Project Directors will arrange for faculty members to receive instruction on new patient simulators. The faculty will then be able to create and implement new simulation activities into clinical courses. The Project Directors will also monitor the number of new simulation activities implemented into clinical courses and survey faculty regarding their confidence levels in simulation after training sessions.

Contextual Information

*If your program offers different tracks and your proposed project focuses on a specific track, provide information for the track that is the focus of the proposed project.

Identify the semester to which the following information pertains:	
a. The program track that is the focus of the proposed project, if applicable:	Initial Track: Associate Degree Program
b. Total number of enrolled nursing students:	300 (over life of the grant)
c. Titles and numbers for required nursing courses that offer clinical or simulation experiences:	• •
c-1. Titles and numbers for required nursing courses that offer simulation:	• RNSG 1360 Clinical-Registered Nursing/Registered Nurse • RNSG 1260 Clinical-Registered Nursing/Registered Nurse • RNSG 1261 Clinical-Registered Nursing/Registered Nurse • RNSG 2360 Clinical-Registered Nursing/Registered Nurse • RNSG 2463 Clinical-Registered Nursing/Registered Nurse
c-2. Total number of students enrolled in required nursing courses that offer simulation:	300 (over the life of the grant)
d. Total number of contact hours of clinical instruction:	942
e. Number of contact hours in patient care clinical situations:	738
f. Number of contact hours in simulation lab:	66 (academic year 2015 -2016)
g. Total number of faculty providing clinical instruction:	14
g-1. Total number of faculty proficient in conducting simulation:	6
g-2. Average ratio of faculty proficient in simulation *to* students during simulation activities:	1 : 5

Sustainability

The Nursing Innovation Grant (NIG) will provide the ADN faculty with the ability to increase and enhance current simulation capabilities. Resources from this project will allow the faculty to further their abilities to develop and create new simulation activities, facilitating an active and collaborative learning environment for students. The nursing faculty will implement several strategies to maintain and advance project goals. The addition of a second simulation lab and a renovated skills lab will allow the faculty to continue to expand and implement more simulation activities, increasing hands-on learning opportunities for students. Grants funds, which will also be utilized for training, assisting the faculty in using our high-fidelity simulators to the best of their abilities, creating a learning environment that closely mimics the traditional health care setting and allows students to practice in a safe and supportive setting.

The ADN faculty will examine the data produced by the project performance measures and outcomes. This information will be utilized to review the simulation activities for areas of improvement and to determine if the simulations are improving students learning outcomes. This data will also assist the faculty in identifying areas of improvement in which didactic and simulation exercises can be more closely linked in order to support student success.

Utilizing grant funds to create a more realistic environment for student learning will assist students in developing their clinical skills. Purchasing simulators, as well as task training modules, will enable the faculty to better prepare students for their clinical learning experiences. The ADN faculty will also be able to maintain and enhance these

activities in future clinical courses, helping more students to be better prepared for the modern health care system.

Texarkana nursing department is committed to sustaining a high-quality simulation program. In order to provide advanced simulation activities within clinical courses, the faculty has approved the addition of a small simulation fee to current student fees. These funds are being utilized to support the warranties and protection plans on the high-fidelity simulators, ensuring these manikins will be used by students for many years to come.

The Associate Degree faculty at Texarkana College is passionate about improving our simulation capabilities and preparing our students for the modern health care system. Integrating simulation exercises into clinical courses will provide learning opportunities, which include knowledge acquisition, clinical reasoning skills, and practical skill development. Currently, Texarkana College is faced with the challenge of decreasing clinical spaces and a nursing staff who requires simulation training. This grant will create opportunities for faculty education, a new simulation lab, and renovation of the current skills labs, all of which contribute to enhancing student readiness for hands-on patient care. Implementing all of these strategies will allow the faculty to shift traditional patient care clinical hours to simulation activities and assist our students in being better prepared for the complex health care setting.

Timeline

Dates	Activity and Method of Delivery (Person Responsible)	Result(s)
Upon Notification of grant award	The project directors will present the program to the TC Board of Trustees, Institutional Review Board and other regulatory bodies for approval	Program accreditation
January 2017	Project Directors will attend grant meeting in Austin Texas	Continuous Improvement
February 2017	Project Directors will begin the process of ordering capital equipment for both the simulation and skills labs	Complete equipment purchases by June 2017
	Project Directors will begin the process of arranging faculty education for new patient simulators	Signed contracts for training in Spring 2017
March 2017	Development of new simulation and skill lab activities for Fall 2017 clinical courses: A. RNSG 1360: Simulation – caring for patients with wounds B. RNSG 1360: Skill lab – head to toe assessments C. RNSG 2360: Simulation – caring for patients with GI condition D. RNSG: Skill lab - Tracheostomy care	New simulation exercises will ready to implement into fall clinical courses by May 2017 Additions to the skill lab schedule will be complete by May 2017
April 2017	Project Directors to review the budget regarding capital expenditures and review current simulation equipment inventory	Continuous monitoring
April 2017	Project Directors will meet with College Facility Services Director regarding renovation for simulation and skill labs	Continuous monitoring
April 2017	Project Directors will arrange for any remaining capital equipment to be purchased	Additional equipment will be on site by June 30th, 2017
June 2017 – August 2017	Project Directors will monitor renovation of simulation and skill labs and purchase any additional non-capital equipment for the labs	Completion of lab renovations by September 2017
June 2017	The International Nursing Association for Clinical Simulation and Learning (INACSL) conference in Washington DC	Faculty will share new information about simulation practices
July 2017	Project Directors and Chief Financial Officer of the College will complete and submit the first expenditure report to the THECB	Completion of report to THECB
August 2017	Project Directors will coordinate the addition of equipment to both the simulation and skill labs to create realism	Complete lab set up by September 2017

September 2017	National League of Nursing (NLN) Education Summit San Diego CA	Faculty will share new information about simulation practices
September 2017	Implementation new simulation exercises and skill development activities into clinical courses: A. RNSG 1360: Simulation – caring for patients with wounds B. RNSG 1360: Skill lab – head to toe assessments C. RNSG 2360: Simulation – caring for patients with GI condition D. RNSG: Skill lab – Tracheotomy care	Successful addition of new simulation into clinical courses Successful addition of new skill sessions into clinical courses
October 2017	Project Directors and Chief Financial Officer will complete and submit the second expenditure report to the THECB	Completion of report to THECB
November 2017	Development of new simulation and skill lab activities for Spring 2018 clinical courses A. RNSG 1260: Simulation - caring for patients with electrolyte imbalances B. RNSG 1260: Skill lab - IV catheter care C. RNSG 1261: Simulation – caring for the complicated post-partum patient D. RNSG 1261: Skill lab – newborn assessment	New simulation activities will be ready to implement in spring clinical courses by December 2017 Additions to the skill lab schedule will be ready by December 2017
December 2017	Project Directors and faculty will review newly implemented simulation and skill lab activities in the spring clinical courses and gather data for the evaluation of project goals	Data gathered for evaluation of project goals
January 2018	Project Directors will complete and submit interim report to THECB	Completion of report to THECB
January 2018 – March 2018	Implementation new simulation and skill lab activities for Spring clinical courses A. RNSG 1260: Simulation - caring for patients with electrolyte imbalances B. RNSG 1260: Skill lab - IV catheter care C. RNSG 1261: Simulation – caring for the complicated post-partum patient D. RNSG 1261: Skill lab – newborn assessment	Successful addition of new simulation into clinical courses Successful addition of new skill sessions into clinical courses
January 2018	Project Directors and Chief Financial Officer will complete and submit the third expenditure report to the THECB	Completion of report to THECB
February 2018	Project Directors will attend the second grant meeting in Austin Texas	Continuous Improvement
March 2018 – April 2018	Development of new simulation and skill lab activities for Fall 2018 clinical courses: A. RNSG 1360: Simulation – caring for patients with hypoxia B. RNSG 1360: Skill lab – vital signs C. RNSG 2360: Simulation – caring for patient with acid - base imbalances D. RNSG 2360: Skill lab – care of central lines	New simulation activities will be ready to implement in fall clinical courses by May 2018 Additions to the skill lab schedule will be ready by May 2018
May 2018	Project Directors and faculty will review new simulation and skill lab activities and gather data for evaluation of project goals	Data gathered for evaluation of project goals
July 2018	Nursing Educator Conference 2017 – Breckenridge, CO	Faculty will share new information about simulation and education
July 2018	Project Directors and Chief Financial Officer will complete and submit the fourth expenditure report to the THECB	Completion of report for THECB
August 2018 - November 2018	Implementation of new simulation and skill activities into fall 2018 clinical courses A. RNSG 1360: Simulation – caring for patients with hypoxia B. RNSG 1360: Skill lab – vital signs C. RNSG 2360: Simulation – caring for patient with acid - base imbalances D. RNSG 2360: Skill lab – care of central lines	Successful addition of new simulation into clinical courses Successful addition of new skill sessions into clinical courses
September 2018	National League for Nursing (NLN) Education Summit – Chicago, IL	Faculty will share new information about simulation and education
December 2018	Project Directors and faculty will review newly implemented simulation and skill lab activities in the fall courses and gather data for evaluation of project goals	Data gathered for evaluation of project goals
December 2018	Grant Period Ends	
February 2019	Project Directors will complete and submit the final project report to the THECB	Completion of report to THECB
March 2019	Project Directors and Chief Financial Officer will complete and submit the final expenditure report	Completion of report to the THECB

Budget

Applicant Institution: Texarkana College
2500 N Robison Rd Texarkana TX 75599

Budget Detail By Category	Year 1	Year 2
A. Faculty and Staff Release Time for Curriculum and Course Redesign		
Release Time Total	**$ 0**	**$ 0**
B. Equipment (Including Software)		
• **Patient Simulators and accessories (see below)**	$ 77, 016.00	$ 0

	Description	Quantity	Cost per unit	Total Cost	t
	Nursing Anne – simulator	03	4, 641.00	13, 923.00	
	Sim Pad Plus	03	644.00	1, 932.00	
	LLEAP for Sim Pad (software)	03	2, 300.00	6, 900.00	
	Wound Care Module	03	1, 845.00	5, 535.00	
	Breast Exam Module	02	663.00	1, 326.00	
	Mastectomy Module	02	477.00	954.00	
	Adult Pelvic – no bridge	02	241.00	482.00	
	Fundus and Assessment Module	02	477.00	954.00	
	All in one Patient Monitor	03	2, 903.00	8, 709.00	
	Hospital bed	04	2, 550.00	10, 200.00	
	General transport stretcher	01	1, 398.00	1, 398.00	
	Alaris Medley Infusion Pump	02	1, 830.00	3, 660.00	
	NG and Trach Trainers	04	1, 350.00	5, 400.00	
	Wound Care Training Sets	04	538.00	2, 152.00	
	Life Form Special Needs Infant	02	445.00	890.00	
	Simulation in Nursing Education: Scenario Set (software)	01	3,540.00	3, 540.00	
	Catheter and enema simulator	04	565.00	2, 260.00	
	Demo injection education pads	04	90.00	360.00	
	Simulator intradermal injection module	02	210.00	420.00	

	Life Form Special Needs Infant	02	445.00	890.00	
	Simulation in Nursing Education: Scenario Set (software)	01	3,540.00	3, 540.00	
	Catheter and enema simulator	04	565.00	2, 260.00	
	Demo injection education pads	04	90.00	360.00	
	Simulator intradermal injection module	02	210.00	420.00	
	Shipping			6, 021.00	
•	**Skills lab equipment (see below)**			$ 56, 833.00	$
	Description	Quantity	Cost per unit	Total Cost	Year 2
	Simulated Headwall	20	959.00	19, 180.00	
	Over Bed Lights	20	891.00	17 ,820.00	
	Glove Dispensers	20	18.00	360.00	
	Personal Protection Organizers	08	195.00	1, 560.00	
	Utility Baskets	22	95.00	2, 090.00	
	Admission Kits	22	9.00	198.00	
	Privacy Curtains	20	----	4, 800.00	
	Track for Curtain	20	----	5, 725.00	
	Shipping			5, 100.00	
	Equipment (Including Software) Total			**$133, 849.00**	**$0**
C.	**Facility Renovation**				
•	Simulation and Skills Labs – • Doors with locks (4@$569.25) $2,277.00 • Building materials $1,193.00 • Paint materials $385.00 • Windows $212.00 • Electrical $850.00 • Vinyl plank flooring $8,100.00 • Insulation (installed) $412.00				
	• Labor $1,380.00				
	Facility Renovation Total			**$ 14,809.00**	**$0.0**

Budget Detail By Category				Year 1	Year 2
D. Faculty Development					
•	**Training on patient simulators (see below)**				
	Description	Quantity	Cost per session		
	Training on new simulator (Nursing Anne)	02	$2, 375.0	4, 750.00	
	LLEAP software	02	2, 375.00	4, 750.00	
	Training new HF simulator (SIM Mom)	01	4, 540.00	4, 540.00	
	Training new HF simulator (Sim Newbie)	01	4, 540.00		4, 540.00
	Training new HF simulator	01	4, 540.00		4, 540.00
				Total 14, 040.00	Total 9, 080.00
•	**Simulation conferences**				
		Conference Cost	Hotel, Airline & Food	Total – Year 1	Total- Year 2
	INACSL conference 2017 – Washington DC	750.00	1, 050.00	1,800.00	
	NLN Education Summit 2017 – San Diego CA	675.00	950.00	1, 625.00	
	Nurse Educators Conference 2017 – Breckenridge CO	500.00	825.00	1, 325.00	
	NLN Education Summit 2018 – Chicago IL	675.00	950.00		1, 625.00
				Total 4, 750.00	Total 1, 625.00

Faculty Development Total	**$ 18, 790.00**	**$ 10, 705.00**
	$	**$**

E. NIGP Grant Meetings				
•	NIGP Meetings			
		Hotel, car rental and food	Year 1	Year 2
	Meeting January 2017	540.00	540.00	
	Meeting Februarys 2018	540.00		540.00

NIGP Grant Meetings Total	**$ 540.00**	**$ 540.00**
F. Other Direct Costs	**$**	**$**
•	$	$
Other Direct Costs Total	**$**	**$**
Total NIGP Funding for Each Year	**$ 167, 988.00**	**$ 11,245.00**
Total NIGP Funding for Grant Period	**$ 179, 233.00**	

Goals and Performance Measures

Applicant Institution: Texarkana College 2500 N Robison Rd Texarkana TX 75599			
Goals and Performance Measures	**Baseline**	**Year 1 Outcomes *Proposed*: Actual**	**Year 2 Outcomes *Proposed*: Actual**
Example Goal: Increase student persistence in the degree program.			
• Percent of students persisting to second year of degree plan	60%	*75%*:	*90%*:
Goal 1: To shift clinical hours from traditional patient care clinical situations to simulation activities			
• Percent decrease in contact hours in traditional patient care setting in RNSG 1360 (1st semester)	87.5%(126 hrs.)	8%(116hrs): X	14%(108hrs.): X
• Percent increase in clinical hours in simulation in RNSG 1360 (1st semester)	12.5% (18 hrs.)	55% (28hrs.): X	100%(36hrs): X
• Percent decrease in contact hours in traditional patient care setting in RNSG 1260 (2nd semester)	81.2% (78 hrs.)	10%(70hrs): X	20% (62hrs.): X
• Percent increase in clinical hours in simulation in RNSG 1260 (2nd semester)	18.8% (18 hrs.)	44%(26hrs.): X	88%(34hrs.): X
• Percent decrease in contact hours in traditional patient care setting in RNSG 1261 (2nd semester)	87.5%(84 hrs.)	9%(76hrs.): X	19%(68hrs.): X
• Percent increase in clinical hours in simulation in RNSG 1261 (2nd semester)	12.5% (12hrs.)	66%(20hrs.)	133%(28hrs.): X
• Percent decrease in contact hours in traditional patient care setting in RNSG 2360 (3rd semester)	92.7%(178 hrs.)	4.%(170hrs.): X	9%(162hrs.): X
• Percent increase in clinical hours in simulation in RNSG 2360 (3rd semester)	7.3% (14 hrs.)	57%(22hrs.): X	110%(30hrs.): X
• Percent decrease in contact hours in traditional patient care setting in RNSG 2463 (4th semester)	92.9%(238 hrs.)	4%(228hrs.): X	8%(218hrs.): X
• Percent increase in clinical hours in simulation in RNSG 2463 (4th semester)	7% (18 hours)	55%(28hrs.): X	110%(38hrs.): X

Goal 2: To Improve student clinical competency through increase participation in simulation activities			
• Percent increase of students who will obtain level II or greater on standardized test end of the clinical course – RNSG 1360	***	An increase of 5%	An increase of 7%
• Percent increase of students who will obtain level II or greater on standardized test end of the clinical course – RNSG 1260	###	An increase of 5%	An increase of 7%
• Percent increase of students who will obtain level II or greater on standardized obstetric test end of the clinical course – RNSG 1261	71%	4%(75%) : X	7%(77%) : X
• Percent increase of students who will obtain level II or greater on standardized pediatric test end of the clinical course – RNSG 1261	34.2%	6%(40%) : X	11%(45%): X
• Percent increase of students who will obtain level II or greater on standardized test end of the clinical course – RNSG 2360	29.5%	10.5%(40%): X	15.5%(45%): X
• Percent increase of students who will obtain 90% probability or greater on standardized assessment at the end of the clinical course – RNSG 2463 (first time to test)	51.4%	8.6%(60%): X	13.6%(65%): X
Goal 3: To increase the capacity of faculty to conduct simulation			
• Number of educators receiving training on new patient simulators	6	14 : X	14 : X
• Number of new simulation activities implemented by faculty	12	5(17) : X	10(22) : X
• Percent of faculty who perceive themselves as confident or very confident in simulation activities after training	42%	70% : X	80% : X

*** The Fundamental course will be utilizing a new standardized assessment this fall. This data will then be used as a baseline for Fall 2017.
- The first medical-surgical course will be utilizing a new standardized assessment this spring, will not have baseline data for comparison. However, will be able to compare year 1 to year 2.

Leveraged Resources (To be completed in Final Narrative Report)	
Matching funds	
In-kind contributions	
Grant awards received	

References

Aebersold, M., & Tschannen, D. (2013). Simulation in nursing practice: The impact on patient care. *The Online Journal of Issues in Nursing, 18* (2). doi 10.312/OJIN.Vol18No02Man06

Hayden, J., Jeffries, P., & Kardong-Edgren, S. (2014). The NCSBN national simulation study: A longitudinal, randomized, controlled study replacing clinical hours with simulation in prelicensure nursing education. *Journal of Nursing Regulation, 5*(2), S3 - S40 doi: 10.1016/S2155-8256(15)30062-4

NLN. (2016). NLN education summit 2017: Our community of colleagues. Retrieved from http://www.nln.org/professional-development-programs/programs-events/call-for-abstracts

Jeffries, P., & National League for Nursing. (2016). *The NLN Jeffries simulation theory.* Philadelphia, Pennsylvania: Wolters Kluwer.

Chapter Four

Effectiveness of a Structured Online Prebriefing Activity on Prelicensure Students' Clinical Judgment

Abstract

Significance of the Problem: Today's healthcare environment requires new nurses to have strong clinical judgment skills upon entry to practice. Contributing to this problem are the challenges faced by prelicensure nursing programs that include faculty shortages and the decreasing availability of clinical spaces. Simulation activities offer hands-on clinical learning opportunities in the place of traditional clinical experiences. However, simulation labs are costly to develop and maintain, which impacts student learning opportunities. Prebriefing, an understudied area of simulation, provides educators with another clinical exercise to facilitate students' growth in clinical judgment.

Objective: The purpose of this study was to explore the effects of a structured online prebriefing exercise on prelicensure nursing students' clinical judgment skills.

Hypothesis: The clinical judgment of the prelicensure nursing students who receive a structured online prebriefing exercise before an active simulation scenario is stronger than the clinical judgment of students who receive traditional prebriefing.

Methods: A quasi-experimental randomized group design with a pretest-posttest approach was used to examine clinical judgment scores of participants, comparing the group who received a structured online prebriefing exercise to a group that received traditional face-to-face prebriefing.

Planned Analysis: The clinical judgment scores from the Creighton Competency Evaluation instrument that were examined using an independent t-test for differences showed no statistical differences between the two groups. The Simulation Effectiveness Tool – Modified demonstrated that students perceived the online prebriefing exercises to be beneficial to their learning.

Keywords: Clinical judgment, prebriefing, simulation, prelicensure students

Effectiveness of a Structured Online Prebriefing Activity on Prelicensure Students' Clinical Judgment

Clinical judgment is essential for nurses practicing in today's fast-paced and complex healthcare environment. New nurses begin their careers having to develop substantial clinical judgment. Nursing researchers have noted that strong clinical judgment skills are a critical part of the high-quality care that optimizes patient outcomes (Benner, Sutphen, Leonard, & Day, 2010; Coram, 2016; Johnson et al., 2012; Lasater, Nielsen, Stock, & Ostrogorsky, 2015). Nursing researchers have also shown that new nurses often lack the clinical judgment skills required to care for patients in the modern healthcare setting (del Bueno, 2005; Fenske, Harris, Aebersold, & Hartman, 2013; Lasater, 2011; Miraglia & Asselin, 2015). Clinical judgment is the ability of the nurse or nursing student to collect and make sense of a patient's data, to utilize that information to make informed clinical decisions and implement appropriate nursing actions followed by an evaluation of the patient's response (Bussard, 2018; International Nursing Association for Clinical Simulation (INACSL), 2018). Clinical judgment is multifaceted and influenced by the nurse's previous experiences, problem-solving, critical thinking, and clinical-reasoning abilities (Lindsey & Jenkins, 2013).

Prelicensure nursing programs across the United States face challenges that include faculty shortages and the decreasing availability of clinical spaces as they prepare students for real-world practice. Simulation activities offer nursing programs hands-on learning activities that can be used to support student learning, including the development of clinical judgment in the face of limited traditional clinical experiences. Until recently, nursing simulation research has primarily focused on student satisfaction and self-

confidence after participation in simulation-based exercises, anxiety related to simulation exercises and debriefing methodologies (Dreifuerst, 2012; Gantt, 2013; Kardong-Edgren, & Fey, 2017; Mariani & Doolen, 2016; Neill & Wotton, 2011; Page-Cutrara & Turk, 2017).

Nurse educators are increasingly using simulation-based activities to teach students clinical skills, apply theoretical knowledge, and provide a safe environment for the development of clinical judgment (Doolen et al., 2016; Fisher & King, 2013; Johnson et al., 2012; Lavoie, Cossette, & Pepin, 2016; Miraglia & Asselin, 2015; Sulaiman & Lasater, 2016). However, nursing programs face challenges related to the high cost of constructing and maintaining realistic lab settings and high-fidelity simulators. Many nursing programs struggle to afford simulation labs, and as a result, students receive fewer simulation-based learning experiences (Hanberg, Brown, Hoadley, Smith, & Courtney, 2007; Maloney & Haines, 2016). Online structured prebriefing activities offer educators an opportunity to decrease time constraints and lab congestion as students come to the lab prepared to start the active simulation scenario (Leigh & Steuben, 2018). Creating a process to improve flow through simulation exercises will enable more students to participate in these hands-on learning activities. According to Forbes et al. (2016) teaching that utilizes online videos provides students with both the context and a visual demonstration of skills, which assists students in linking theoretical content to clinical practice.

In 2017, the International Nurses Association for Clinical Simulation and Learning (INACSL) identified prebriefing as one of the organization's research priorities (INACSL, 2018). Prebriefing, the first stage of the simulation experience, offers

educators an opportunity to examine nursing students' ability to gather and analyze patient information and create an anticipatory plan of care. These actions reflect the first two stages of Tanner's model of clinical judgment, noticing and interpreting (Tanner, 2006). The purpose of this study was to investigate the effect of a structured online prebriefing activity on prelicensure students' clinical judgment during simulation.

Review of Literature

The fast pace of today's modern healthcare system requires nurses to manage complex patients and make critical clinical decisions about their care. Strong clinical judgment skills are essential to the delivery of safe patient care and improving patient outcomes (Benner et al., 2010; Coram, 2016; Johnson et al., 2012; Miraglia & Asselin, 2015; Sulaiman & Lasater, 2016). Nursing researchers recognize that new graduate nurses do not have strong clinical reasoning and judgment abilities (del Bueno, 2005; Fenske et al., 2013; Lasater et al., 2015; Lawrence, Hilfinger-Messias, & Cason, 2018; Miraglia & Asselin, 2016; Theisen & Sandau, 2013). The reasons for the underdevelopment of clinical judgment in new nurses is not clear. According to Lasater et al. (2015), new nurses do not have an experiential knowledge base to draw from, an essential aspect of clinical judgment. However, nursing research does indicate that clinical judgment is a learned ability (Cappelletti, Engel & Prentice, 2014; Sulaiman & Lasater, 2016). Simulation activities offer students hands-on learning experiences to support their clinical judgment development.

Clinical judgment is "the art of making a series of decisions to determine whether to take action based on various types of knowledge. The individual recognizes changes and salient aspects in a clinical situation, interprets their meaning, responds appropriately,

and reflects on the effectiveness of the intervention", according to Standards of Best Practise: Glossary (INACSL, 2016). Tanner (2006) asserts that nurses also base their clinical judgments on their knowledge, personal values, and clinical experiences as well as the context of their work environment.

Simulation-based learning is one of the strategies educators are using to facilitate clinical judgment along with practical skills and knowledge development in prelicensure nursing students. The American Association of Colleges of Nursing (AACN, 2018), the National League for Nurses (NLN, 2015), and INACSL (2016) support the use of simulation activities as a teaching methodology for practical and clinical judgment skills. Until recently, most of the nursing research concerning simulation has focused on students' self-reporting rather than its effects on learning outcomes, such as clinical judgment and or competency (Lapkin, Levett-Jones, Bellchambers, & Fernandez, 2010; Lindsey & Jenkins, 2013; Page-Cutrara & Turk, 2017). Lasater (2007) recognized that simulation provides educators with a vehicle for teaching clinical judgment in a safe environment. Nurse researchers have utilized several instruments including the Lasater Clinical Judgment Rubric (2007) to examine the relationship between simulation activities and clinical judgment and have noted that simulation exercises can foster the development of students' clinical judgment (Bussard, 2018; Fedko & Dreifuerst, 2017; Victor, 2017). Researchers have also examined the effects of debriefing sessions on students' clinical judgment development (Dreifuerst, 2012). Preliminary nursing research has indicated that structured debriefing supports meaningful reflection, which positively contributes to students' clinical development (Dreifuerst, 2012; Forneris et al., 2015; Mariani & Doolen, 2016). Sulaiman and Lasater (2016) conducted a concept

analysis of debriefing for clinical judgment and noted that a structured debriefing process assists students in developing their clinical judgment abilities. However, prebriefing, the first phase of the simulation process, has been overlooked for its contributions to students' clinical learning (Chamberlain, 2016; Fey, 2016; INACSL, 2018; Leigh & Stuben, 2018; McDermott, 2016; Page-Cutrara, 2015).

Prebriefing

Prebriefing is the introductory phase of the simulation experience. Researchers have also referred to it as pre-simulation, pre-scenario, and briefing (Tyerman et al., 2019). Tyerman et al. (2016) described pre-simulation preparation as content or materials that are provided in advance of simulation exercises and can include lectures, assigned readings, skill practice, and assessment activities such as quizzes. These exercises are designed by educators to optimize students' simulation learning experiences. Prebriefing and briefings have been used interchangeably by researchers to mean the exercises or interactions between faculty and participants immediately prior to the simulation (Tyerman et al., 2019). According to Best Practices Standards by INACSL (2016), prebriefing is designed to assist learners in preparing for the simulation exercise and is achieved with pre-simulation assignments, outlines of learning objectives as well as an orientation to the equipment and lab environment. This phase of the experience helps to establish a safe environment and foster a culture of learning for the students (Rudolph, Raemer & Simon, 2014). The Standards for Best Practices for Simulation Design developed by INACSL (2016), documents the importance of giving participants clear instructions before the simulation experience, which helps to set the stage and clarify expectations for both the learners and the facilitators. Learners who are

provided with clarity about expectations and what to expect during the learning experience are more likely to engage in the activities and often find these exercises to be beneficial to their performance in simulation-based experiences (Rudolph, Raemer & Simon, 2014; Tyerman, Luctkar-Flude, Graham, Coffey, & Olsen-Lynch, 2016). McDermott (2016) conducted a Delphi study with certified Healthcare Simulation Educators (CHSE), and 81% of those surveyed agreed that prebriefing is vital to simulation success and may enhance debriefing and reflection activities.

In 2015, Chamberlain and Page-Cutrara each published a concept analysis of prebriefing. Chamberlain (2015) noted that prebriefing is a set of activities that involve orientation to the simulation experience, the required equipment, and the lab environment before participation in the learning scenario. Page-Cutrara (2015) also described prebriefing as activities that occur before simulated learning experiences. This researcher went on to identify three phases of prebriefing: considering the situation, perceiving meaning, and anticipating a plan (Page-Cutrara, 2015). Considering the situation is the process by which learners develop some familiarity with simulation regarding the patient's health status and the context of the learning experience, for example, the patient's report and scenario setting. Page-Cutrara (2015) identified the second stage of prebriefing as perceiving meaning, which considers the students' level of understanding and knowledge about the information provided before active participation in the simulation. The student's ability to clinically reason from the information gathered during the prebriefing session can impact their ability to care for the patient in the simulation scenario. If a student has trouble gathering and analyzing data before the

simulation, then the student may not be able to identify and respond to patient problems correctly.

The final attribute identified by Page-Cutrara (2015), is the creation of an anticipatory plan. According to the Standard of Best Practice: Simulation Design by INACSL (2016), prebriefing should include activities that provide students with the opportunity to plan. These are activities that assist the students in focusing on the simulated patient's needs. Prebriefing activities help to prepare students for the simulation learning experience so they can meet stated objectives and actively participate in the learning exercise (Husebo, Friberg, Soreide, & Rystedt, 2012; Chmil, 2016; Leigh & Steuben, 2018; Leighton, 2009; McDermott, 2016).

Prebriefing in Simulation Research

A literature review found fourteen studies that included prebriefing in the title, one article that used the term briefing in the title, and three articles that used pre-simulation in the title. One of these manuscripts was a literature review conducted in 2014; the author noted that seven of the ten articles reviewed contained references to prebriefing in the abstract, and only one manuscript had prebriefing in the title. The researcher also indicated that studies which met the inclusion criteria aligned with Fanning and Gaba's (2007) description of prebriefing which includes an explanation of the learning objectives, orientation to the simulator and lab environment as well as the student's role, patient report and expected conduct (Page–Cutrara, 2014).

In 2015, Brackney and Priode developed six different learning activities to teach students how to care for a deteriorating patient. In this study, all the students received prebriefing instructions that included detailed learning objectives and then participated in

six educational events consisting of games, simulations, and videos. Based on faculty feedback, Brackney and Priode (2015) concluded that the pre-briefing exercises were essential to students' simulation performance. Although this study found that prebriefing was crucial to student success in simulation, the researchers did not provide quantitative or qualitative data to support this finding.

In 2015, Sharoff conducted a study that examined the efficacy of pre-briefing preparatory materials and the connection between simulation, clinical judgment, and reflective practice. The participants in the study were prelicensure students who were provided pre-briefing materials about a simulation scenario in advance. The pre-briefing materials provided an overview of the simulation scenario, student roles, and online link to educational resources about the topic of the simulation, which was caring for a patient with a cerebral vascular accident. The participants also received a hyperlink to the Lasater Clinical Judgment Rubric scoring sheet. The students were surveyed after receiving the pre-briefing materials and again after participation in the simulation exercises to gather their perceptions about the prebriefing exercises and their readiness for simulation. The majority of the student reported that they felt they were given enough information to actively participate in the simulation exercises. The faculty who directed the simulation were also surveyed and indicated that prebriefing materials they received helped them to be better prepared for the simulation and, therefore, better able to support student learning. Sharoff (2015) concluded that preparation of students before simulation exercises could facilitate clinical judgment and the reflective process during debriefing sessions. However, the researcher did not provide any statistical data to support the

study's findings. Clinical judgment is a complex multi-faceted process, and additional studies are needed to support this conclusion.

Curl, Smith, Chisholm, McGee, and Dass's (2016) research study examined the effectiveness of using high-fidelity simulation to replace 50 percent of traditional clinical experiences in obstetrics, pediatrics, critical and mental health nursing. The experimental group participated in 20 simulation modules, five for each specialty area plus traditional clinical experiences. The control group participated in traditional clinical experiences only; however, both groups received the same amount of clinical hours. The students in the experimental group received pre-simulation exercises that were comprised of assigned case studies and a discussion of the case study before participating in the simulation scenario. The researchers noted that these pre-simulation exercises contributed to the students' learning. However, learning was evaluated using standardized assessment exams, and many factors, such as study strategies and test anxiety, can impact scores. Although this study explored the ability of simulation exercises to replace traditional clinical learning experiences, it also supports the use of pre- simulation exercises.

Jones and Potter (2017) explored the application of INACSL best practice standards for simulation during critical care response team training. The participants completed prebriefing assignments, which included three modules about prioritization of care before participating in the simulations. The participants also received an orientation to the simulation environment and a review of the roles and objectives immediately before the scenario. The researchers noted that the first group of participants reported a lack of familiarity with the simulators, which was a distraction to their learning. The

researchers then added a brief video demonstration of the high-fidelity simulator to subsequent prebriefing sessions. According to Jones and Potter (2017), the addition of video to the prebriefing exercises appeared to enhance the confidence and engagement of later participants. However, the researchers did not specifically ask participants about the effect of the prebriefing on their overall simulation experiences. This study supports the need for additional research regarding the impact of prebriefing exercises on students' readiness for simulation and its contributions to achieving learning outcomes.

In 2017, Chamberlain conducted a quasi-experimental post-test only study that explored the impact of prebriefing exercises on nursing students' perception of overall effectiveness, learning, and self-confidence. The researcher divided the sample into four groups; the first group did not receive any prebriefing activities. The second group received a 20-minute prebriefing that included a review of the learning objectives, roles of each participant, and an orientation to the lab and equipment, including the simulator. The students also participated in learning engagement activities that consisted of a 4-minute video about the simulation topic, respiratory distress, and were given time to complete a worksheet. The last stage of these prebriefing exercises consisted of a faculty-led group discussion about caring for patients with respiratory distress. The third group of students participated solely in the learning engagement activities, and the fourth group just received the orientation activities. All the study participants completed the Simulation Effectiveness Tool (SET) after completion of the simulation scenario.

The group that received prebriefing exercises, which included orientation and learning engagement activities, scored significantly higher than those who received none. The researcher also found that students' perceptions of overall learning and confidence

were higher in those that received the prebriefing exercises than those that did not. However, the post hoc analysis did not demonstrate a significant difference between the groups who received the learning engagement activities and the group that received orientation activities (Chamberlain, 2017). The researcher did acknowledge that the study faced several limitations, including a lack of randomization of the groups, which is a common problem in simulation research. The researcher also conducted all the simulations, which may contribute to the bias in the study. Chamberlain also changed the last item on the SET from debriefing to prebriefing, which lowered the overall Cronbach's alpha to .904. This study demonstrated the importance of prebriefing exercises to prelicensure nursing students and indicated that these students believed that prebriefing activities contributed to their confidence and learning during simulation.

Page-Cutrara and Turk (2017) investigated the effect of a structured prebriefing activity on nursing students' competency performance and clinical judgment. The researcher also examined students' perceptions of prebriefing activities. The researchers utilized an experimental randomized group design in which the control group received an orientation to equipment, roles, objectives, and a patient report. The experimental group received these instructions plus a prebriefing worksheet and a short-facilitated reflection. The researchers evaluated the students' clinical competency and clinical judgment using subscales from the Creighton Competency Evaluation Instrument (CCEI) that has a Cronbach's alpha rating of > 0.90 when used to score simulation performance (Hayden, Keegan, Kardong-Edgren, & Smiley, 2014). A Prebriefing Experience Scale (PES), adapted from Reeds' debriefing experience scale, was used to gather the students' perceptions of the prebriefing experience (Page-Cutrara & Turk, 2017). A strength of

this study was that the researchers conducted a pilot study of the PES before the research project, and it demonstrated a Cronbach's alpha of 0.94 for the overall scale.

The authors employed an independent t-test to compare the total mean scores of the CCEI – subscale clinical judgment (CJ) between the two groups. The experimental group's scores for clinical judgment (M = 89, SD = 10.5) were higher than the control groups (M = 62.5, SD = 15.7). However, because the participants were recruited and participated in the simulation over two semesters, a Mann-Whitney U test was used to compare the distributions of the scores. The scores for the experimental group were significantly higher than the control group, U = 128.5, Z = -6.2, p = < .001, supporting the use of a structured prebriefing exercise to facilitate student's clinical judgment. The ANCOVA was used to control for the covariate of the semester, it demonstrated a medium effect (n^2 = .06), which also supported the positive impact of structured prebriefing exercises on students' clinical judgment development. A Mann-Whitney U analysis revealed that the experimental group who received the structured prebriefing activity had a better perception of prebriefing than the control group, U = 281.0, Z = -4.54, p < .001. Researchers indicated that all participants had the opportunity to provide feedback on this instrument, and comments from both groups were positive (Page-Cutrara & Turk, 2017).

Preliminary findings from this study support structured prebriefing as an exercise that contributes to the student's clinical judgment. The researcher's priori analysis (stated p = 0.05, power 80%, d = 0.5) indicated that a sample size of 128 was needed. However, the researchers were only able to recruit 76 students over two semesters for this study, leaving it underpowered. Conducting the study with a small sample size affects

the analysis, and the results of this study were underpowered for comparisons between experimental and control groups regarding clinical judgment and competency performance. These results explicitly limit the generalizability of the study results. Also, no statistically significant relationship between clinical judgment, clinical competency, and perceived prebriefing experiences was noted. However, nursing research has previously documented conflicting results between students' self-perceptions and actual performance (Bambini, Washburn & Perkins, 2009; Kim, Noh & Im, 2017; Page-Cutrara & Turk, 2017). Page-Cutrara and Turks' (2017) study provided preliminary support for the use of structured prebriefing in simulation and laid a foundation for further studies.

Kim, Noh, and Im (2017) conducted a quasi-experimental, nonequivalent control group, non-synchronized research project that explored the effect of prebriefing exercises on clinical competency and flow of nursing students during simulation-based activities. The authors describe flow as a state where "one completely focuses on a certain activity and feels pleasure through intrinsic motivation" (Kim, Noh & Im, 2017, p. 545). According to Kim, Noh, and Im (2017), when participants experience flow during simulation activities, their learning experience is enhanced, which can result in increased clinical competency. The researchers measured flow with a 10 item scale, developed by Engers and Rheinberg in 2008. The participants consisted of 205 junior and senior-level baccalaureate nursing students from South Korea. The researchers used a G*power analysis to determine sample size ($p = 0.05$, power 90%, $d = 0.75$), which indicated a minimum of 30 participants per group. Two hundred and five students met the inclusion criteria, the control group = 62, experimental group 1 = 97 and experimental group 2 = 76. The large sample size was a strength of the study.

The control group was provided with a verbal orientation to the simulator, along with an introduction to the scenario and an explanation of each student's role. The first experimental group received a verbal orientation along with instructions of core nursing skills expected and a review of the simulator's abilities before simulation. The second experimental group received all the instructions the previous groups had and were allowed to practice hands-on skills for a few minutes before the start of the simulation. The participant's clinical competency was evaluated using the translated Korean version of Lee's Self-Evaluation Clinical Competency Tool that has a Cronbach's alpha of .95 (Kim, Noh & Im, 2017). The data analysis revealed that the instructors' evaluation of experimental group 2 *(M* = 84.37, *SD* = 8.1) was higher than experimental group 1 (*M* = 76.67, *SD* = 11.83) and the control group (*M* = 67.62, *SD* = 15.05). Similarly, the student self-evaluation scores for experimental group 2 (*M* = 9.98, *SD* = .44) were also higher than experimental group1 (*M* = 3.70, *SD* = .58) and the control group (*M* = 3.87, *SD* = .51). The researchers also noted that student satisfaction scores were higher for experimental group 2 (*M* = 7.72, *SD* = 1.64) than both the experimental group 1 (*M* = 6.72, *SD* = 1.86) and the control group (*M* = 7.62, *SD* = 1.71).

Kim, Noh, and Im's (2017) research demonstrated that a three-step prebriefing exercise significantly improved the clinical competency, flow, and satisfaction scores of baccalaureate nursing students. However, the quasi-experimental design of the study limits the generalizability of these results. It is also important to note that the researchers did not pretest clinical competency and flow, limiting the study's findings. The study results support the importance of prebriefing exercises in enhancing students' clinical competency, satisfaction, and self-confidence. However, a pretest-post-test design would

have allowed the researchers to evaluate the step-based prebriefing intervention more effectively.

Beman, Litwack, Daley, Duchateau, and Morgan (2017) also conducted a study that examined the impact of a prebriefing activity on students' clinical competence. The researcher used a quasi-experimental post-test only comparison design, and the sample consisted of associate degree novice nursing students. The control group received standard prebriefing exercises that included an orientation to the lab, equipment, and a hands-off patient report. The experimental group received the standard prebriefing activity plus time to develop a care plan or a concept map. The students' simulation performances were videotaped and then scored by two faculty evaluators using the Creighton Competency Evaluation Instrument. The results demonstrated significant differences between the two groups communication and clinical judgment subscale scores. However, the study was unpowered due to the small sample size, which limits the generalizability of the results. The study supports the use of prebriefing exercises as an educational strategy for enhancing students' clinical judgment, but more studies are needed to support these findings.

In 2018, Roh, Aha, Kim E., and Kim J. explored the impact of a prebriefing exercise on simulation participants' psychological safety and learning outcomes. The researchers used a nonequivalent control group posttest design. The experimental group (n=163) received prebriefing activities that consisted of skills practice, a review of the scenario, concept mapping, an orientation to the simulation equipment and lab, and a fiction contract agreement. The student in the control group received prebriefing exercises that were comprised of skills practice, a review of the scenario, and an

orientation to the simulation equipment and lab. The students' simulation performance was scored using the Korena version of the Advanced Cardiovascular Life Support skill checklist. The experimental group showed higher psychological safety measures and cardiopulmonary resuscitation scores than the control group. However, the academic safety scores were not statistically different between the two groups. The researchers concluded that nursing students who have limited knowledge and experience could benefit from prebriefing exercises to enhance and support simulation-based learning (Rok, Aha, Kim E., & Kim J., 2018).

The preliminary findings of these research studies support the use of structured prebriefing exercises as part of the simulation-based learning experience. The results of these studies indicate that students who participated in learner-based prebriefing exercises demonstrated higher clinical competency scores (Kim, Noh & Im, 2017; Page-Cutrara & Turk, 2017; Rok, Ahn, Kim E., & Kim J., 2018). The reports also suggest that students who engage in structured prebriefing activities have higher satisfaction scores and perceive prebriefing as a positive contribution to their learning (Chamberlain, 2017; Jones & Potter, 2017; Kim, Noh & Im, 2017; Page-Cutrara & Turk, 2017). According to Leigh and Steuben (2018), nursing research on prebriefing is beginning to demonstrate the importance of planned prebriefing exercises in engaging and orienting learners for successful simulation-based learning experiences. However, more rigorous studies are needed to examine the relationship between prebriefing exercises and clinical judgment.

Online Simulation

Recent advances in technology, faster internet speeds, and lower computer equipment costs have enabled simulation activities to move to a virtual environment

(Cant & Cooper, 2014). According to Forbes et al. (2016), nursing research regarding the use of videos to teach and support clinical skills is focusing on four key areas: effectiveness, efficiency, video usage patterns, and quality of videos. Kelly, Lying, McGrath, and Cannon (2009) noted that student knowledge and skill performance with online videos were as effective as face to face teaching, and the use of videos received higher student satisfaction scores than traditional hands-on teaching practice. Additionally, multiple authors confirm that the use of videos contributes to improved learner outcomes, especially when the videos are realistic (Cardoso et al., 2012; Forbes et al., 2016; Foronda, Godsall, & Trybulski, 2013; Holland et al., 2013).

According to Foronda, Godsall, and Trybulski (2013), virtual clinical simulation offers nursing education another modality for teaching, especially in the face of faculty shortages, the decreasing availability of traditional clinical spaces, and the high cost of simulation labs. New and advancing technologies provide educators with alternative activities to support cognitive skill development, such as clinical judgment. In 2016, Coram studied the impact of an online prebriefing expert role model video on novice nursing clinical judgment scores. Both the control and experimental group received a face to face orientation to the simulation lab, a patient chart to review, and a verbal report of the patient current health status. The experimental group also watched a video of an expert nurse modeling care of a standardized patient with a think out loud document. Two masters prepared nurse educators evaluated the students' performances in simulation using the Lasater Clinical Judgment Rubric (LCJR). The data analysis showed a significant difference between the two groups for both the total and subscale scores for the LCJR. This study supports prebriefing as an effective strategy for improving

students' clinical judgment during simulation. In addition, the study also provides preliminary support for the use of online prebriefing exercises in simulation-based learning activities.

The use of technologies can assist faculty in maximizing resources and reducing faculty workload. Leigh and Steuben (2018) described how the use of a learning management system (LMS) could support prebriefing. The researchers discussed how online assignments, such as tutorials, games, and quizzes, promote student learning and can help to reduce students' anxiety, improve performance and enhance clinical knowledge (Leigh & Steuben, 2018). Although these online activities initially create work for nursing educators, these activities can be repeatedly reused and are often easily modified. Nursing organizations such as the NLN (2015) and AACN (2018) support the use of technology such as virtual simulation to increase clinical learning opportunities across prelicensure nursing curriculums. However, the use of online exercises to assist students in preparing for simulation is not well studied.

The use of simulation-based learning in prelicensure nursing education is an essential teaching and learning strategy. Culyer, Jatulis, Cannistraci, and Brownell (2018) noted that evidence-based practices for teaching support simulation-based learning and the use of these strategies contribute to the transfer of theoretical knowledge to the practice setting. An abundance of research about simulation design and the importance of the debriefing methodologies is present in nursing literature. There is limited information about prebriefing, the first phase of the simulation process. Prebriefing consists of all learning exercises conducted before the start of the active, hands-on simulation scenario and helps to set the stage for the nursing student

(Chamberlain, 2017; INACSL, 2018; Kim, Noh & Im, 2017; Leigh & Steuben, 2018; Page-Cutrara & Turk, 2017). Preliminary research indicates that prebriefing activities contribute to prelicensure nursing students learning in simulation because they have limited clinical experiences to draw from (Bussard, 2018; Leigh & Steuben, 2018). Nursing researchers and organizations have identified prebriefing and its impact on prelicensure nursing students' learning as a gap in nursing research. In addition, nurse researchers and healthcare stakeholders have documented the need for new nurses to have strong clinical judgment skills as they enter the modern healthcare system (Benner, Sutphen, Leonard, & Day, 2010; Johnson et al., 2012; Lasater, Nielsen, Stock, & Ostrogorsky, 2015; Lawrence, Messias & Cason, 2018; Stuedemann & Dreifuerst, 2017).

Theoretical Framework

The increasing acuity of patients in acute care settings and the growing prevalence of chronic illnesses requires all nurses to have strong clinical judgment skills to help patients optimize their health status. Tanner (2006) defined clinical judgment as "an interpretation or conclusion about a patient's needs, concerns or health problems and/or the decision to take action (or not), use or modify standard approaches or improvise new ones as deemed appropriate by the patient's response" (Tanner, 2006, p. 204)

Tanner's model of clinical judgment consists of four stages: noticing, interpreting, responding, and reflecting (see Appendix C). Noticing is the first phase of the clinical judgment model and describes the ability of the nurse to grasp the current clinical situation. The student nurse's understanding of the expectations of the clinical learning situation, as well as their theoretical and experiential knowledge base, influences the first stage of clinical judgment (Miraglia & Asselin, 2015). Within the noticing phase, there

are three dimensions: context, background and relationship, expectations, and initial grasp. This stage is reflective of prebriefing in simulation. According to INACSL (2016), the purpose of prebriefing is to assist learners in preparing for the simulation experience. A concept analysis by Page-Cutrara (2015) identifies three phases within prebriefing: considering the situation, perceiving meaning, and creating an anticipatory plan. These three aspects reflect stages within Tanner's model of clinical judgment. During prebriefing activities, students use their clinical knowledge to consider the simulated patient's current situation, including the patient's background, the 'context of the scenario,' and their relationship or role within the scene. Using this information and their understanding of the simulation's learning expectations, the students make an initial determination about the patient's health status. This action is reflective of the initial grasp section of Tanner's model.

The second phase of Tanner's model is interpreting, during which nurses use reasoning patterns that include analytic, narrative, and intuitive processes to gather information and formulate a course of action (Miraglia & Asselin, 2015). This phase is also reflective of prebriefing in simulation-based learning activities. Page-Cutrara's (2015) concept analysis noted that the second and third aspect of prebriefing is the ability to perceive meaning and create an anticipatory plan. Students in simulation exercises often receive a few minutes to reason about their patient's current situation and use their knowledge to create an anticipatory plan. According to the Standards of Best Practices for Simulation: Simulation Design developed by INACSL (2016), prebriefing exercises should include activities that provide students with the opportunity to plan for the active portion of the simulation.

Tanner's third stage of clinical judgment is responding, during which nurses implement actions or not based on the clinical decisions made in the previous step. With regards to simulation, this is the phase where students begin to participate in the active scenario and implement their anticipatory plan of providing care for the patient. The last stage of the model is reflecting, which includes reflection-in-action and reflection-on-action. Schon (1983) and Tanner (2006) indicated that reflection-in-action is the process of thinking in the moment, which involves evaluating the patient's response to the interventions and deciding if additional actions are warranted. This reasoning and decision-making process is present in the interpreting, responding, and reflecting phases of Tanner's model. Reflection-on-action completes the clinical judgment cycle in the simulation process when the participants review and explore the learning experience for clinical knowledge gains during the debriefing session (Dreifuerst, 2012; Miraglia & Asselin, 2015).

The use of Tanner's model of clinical judgment (2006) as a guiding framework helped to underpin the study's intervention. The structured online prebriefing exercises were comprised of a video orientation to the lab and hands-off a patient report. The participants were given time to explore the data and answer five online prioritization and delegation questions that took into account background and contextual information about the simulation scenario. The last stage of the structured prebriefing exercises consisted of the group of students creating an anticipatory plan of care for the patient. This exercise aligned with the first two stages of Tanner's model (2006) and Page-Cutrara's (2015) three stages of prebriefing. The use of structured online activities reduced faculty workload in the simulation lab while simultaneously preparing the student for the hands-

on simulation scenario. Leigh and Steuben (2018) noted the pre-simulation activities are helpful to prelicensure nursing students as they have limited nursing experiences to inform their decision-making process.

The use of Tanner's model as a framework also helped with the examination of the relationship between the study's variables, structured online prebriefing, and clinical judgment. Tanner's model also provided a logical structure for the study and allowed the researcher to link its findings to nursing's understanding of simulation in education (Burns & Grove, 2009; Creswell, 2014).

Conceptual and Operational Definitions

The following variables were explored in this research study: Clinical judgment, prebriefing knowledge, experience, and beliefs. The table below provides conceptual and operational definitions for all variables in the study.

Table 1. Conceptual and Operational Definitions

Variable	Conceptual Definition	Operational Definition
Clinical Judgment	According to Tanner (2006) clinical Judgment is " an interpretation of conclusion about a patient's needs concerns, or health problems and/or the decision to take action (or not), use or modify standard approaches or improvise new one as deemed appropriate by the patient's response	The decision and action of the participants in the role of the RN implemented during the simulation scenario Measured using the Creighton Competency Evaluation Instrument subscale Clinical Judgment
Prebriefing	The first stage of the simulation process which occurs before the active simulation scenario (INACSL, 2016).	Structured online prebriefing: A video that provides an orientation to the simulation lab, equipment and a hands- off patient report. Five online prebriefing multiple-choice questions and ten minutes to review the patient's online chart and make an anticipatory plan of care Traditional prebriefing: A verbal orientation to simulation lab, equipment and a hands-off patient report by simulation faculty Plus 10 minutes to review the patients paper chart and make an anticipatory plan of care
Knowledge	The familiarity an individual has with a specific subject or branch (Knowledge, 2018). Assigned reading and lecture content on the simulation topic	Knowledge will be measured by 10 multiple choice questions pre and post simulation exercises
Experiences	Are the process of personally encountering or undergoing an event or situation (Experience, 2018).	The students' interactions with either the structured or traditional exercises. Measured using the SET-M
Beliefs	An individual's beliefs are their opinion or confidence in something or someone (Belief, 2018)	The students' opinion or perceptions of the simulation activities especially prebriefing exercises. Measured using the SET-M

Research Hypothesis and Research Questions

The hypotheses were developed from previous research studies described in the literature review. Several studies have examined the impact of prebriefing on students' clinical judgment and competency. However, there is very little research on the effectiveness of a structured online prebriefing exercise on students' clinical judgment. Prebriefing provided educators with another opportunity to develop prelicensure students' clinical reasoning and judgments, skills that are essential in today's complex healthcare environment. Hypotheses for the research include:

1. The clinical judgment of the prelicensure nursing students who received a structured online prebriefing exercise before an active simulation scenario will be stronger than the clinical judgment of students who received traditional prebriefing.
2. The experimental and control groups' knowledge regarding the care of the patient with vascular insufficiency will increase after participating in prebriefing exercises and a simulation scenario.

The researcher also gathered data about the student's perceptions of the prebriefing exercises using the Simulation Effectiveness Tool – Modified (SET-M) and open-ended questions. The research questions are:

1. What are prelicensure nursing students' experiences with structured online prebriefing activities compared to traditional prebriefing exercises?
2. Do prelicensure nursing students' believe that the structured online prebriefing exercises contributed to their readiness for the simulation scenario?

Design

A quasi-experimental randomized group design was used to examine the effects of a structured online prebriefing exercise on prelicensure nursing students' clinical judgment. The experimental design was appropriate as the study compared the impact of a structured online prebriefing exercise to traditional face to face prebriefing exercises on student nurses' clinical judgment. Nursing researchers have previously utilized this type of research design to examine the impact of both prebriefing and debriefing on student's clinical judgment and reasoning abilities (Dreifuerst, 2012; Chamberlain, 2017; Forneris et al., 2015; Lawrence, Hilfinger-Messias, & Cason, 2018; Page-Cutara, 2017). Descriptive and inferential statistical tests were used to describe and analyze the data, which allowed for comparisons between the two groups and generalizations about the results.

Methods

Sample

This project utilized a convenience sample of associate degree nursing students from a junior college in Northeast Texas. A power analysis ($p = 0.05$, power 80%, $d = 0.5$) was conducted prior to the study and determined 102 participants would be required. The inclusion criteria required the study participants to be at least 18 years of age, enrolled in the second semester of the associate degree program, and have had participated in simulation activities in the last six months. All 68 students who were enrolled in the medical-surgical course in the first year of the associate degree program consented to participate in the research. However, because the sample was limited to one group of students at the junior college, the study was underpowered.

The demographic data was collected anonymously with the SET-M survey following the student's participation in the simulation exercises. The control sample (n=31) was labeled as group 0, and the experimental group (n=37) was labeled group 1 to allow for a comparison of the data. Frequency counts for the total sample, and each group was utilized to determine the number of valid cases for each demographic question. All cases were carefully scrutinized for missing data, repetition of numerical values, and accuracy of data entry before the statistical analysis was initiated. Data cleaning noted missing data in the age category, the control and experimental each have one missing case.

Table 2. Comparison of Selected Descriptive Statistics Across the Sample

Category	Control Group (n=31)	Experimental Group (n=37)	Total Sample (n=68)
Ethnicity			
White	93.5	78.4	85.0
African American	6.5	8.1	7.4
Pacific Islander	0	5.4	2.9
Other	0	8.1	4.4
Age Range	19-45	19-48	19-48
Mean	24.5	26.8	25.7
Gender			
Female	28	30	58
Male	3	7	10
Educational level			
Some college credits	21	23	44
Associate Degree	8	11	19
Bachelors degree	1	3	4
Masters degree	1	0	1
Works in Healthcare			
Currently working	32.7	40.5	36.2
Not working in HC	67.7	59.5	63.2
No. of experiences with HFS			
5 or less	35.5	40.5	38.2
5 – 10	61.3	56.8	58.8
10 or more	2.7	2.7	2.9

Initial inspection of the demographic data indicated potential statistical differences between the control and experimental samples regarding ethnicity, age, and the number of participants who currently work in healthcare. Pearson's chi-square test, which examines the relationship between two categorical variables, was utilized to explore differences between the groups (Fields, 2013). Frequency counts of the participant's self-reported ethnicity indicated that the experimental group is more diverse than the control group. However, Pearson's chi-square test determines there was no significant difference between the ethnicities of the two groups X^2 (3) = 4.707, p = .195. A second Pearson chi-square test was conducted to explore differences between groups regarding the number of participants within each group who were working in healthcare at the time of the data collection. This analysis also determined no significant statistical difference between control and experimental group regarding the number of participants who worked in healthcare, X^2 (5) = 6.553, p = .256.

An examination of the demographic data also indicated possible differences between the control and experimental group regarding mean age. An independent t-test was chosen to compare the means because these averages have come from two different groups (Fields, 2013). The average age for the experimental group (M = 26.8, SE = 1.26) is older than the average age for the control group (M = 24.5, SE = 1.04). This difference, -2.36, BCa 95% CI [-5.63, .91], was not statistically significant t (63.3) = -1.44, p = .154.

A review of the subcategory regarding the participants' level of education revealed that some individuals marked high school graduation or trade school certification as their highest level of education. All participants are required to complete

college-level prerequisite courses before admission to the associate degree nursing program. To more accurately reflect the sample, this category was collapsed, high school graduation and trade school certificate were combined with some college credits category.

Most of the sample identified their ethnicity as white (85%) and the next largest group as African American (7.4%). Although the experimental group appears to be more ethnically diverse than the control group, a Pearson Chi-square analysis indicates this difference is not statistically different. This finding is similar to the NLN Biennial Survey of Schools of Nursing 2017- 2018, which reported that 69% of prelicensure nursing students self-identified as Caucasian and 11.8% identified as black/non-Hispanic (NLN, 2019). The analysis of the demographic data indicates that the control and the experimental groups are not statistically different, and therefore, comparisons between these two groups can be made.

Protection of Human Subjects/Informed consent

Ethical approval was sought and obtained from the University of Texas at Tyler, and the junior college's institutional Review Boards (IRB) before any research activities were initiated (see Appendix G and H). A post hoc consent process was used for this study as disclosure of the project to the subjects could have biased the participant's responses and resulted in atypical student behaviors during the simulation scenario (Portney & Watkins, 2015). A detailed description of the study's purpose, risks, and benefits was presented to the participants during a scheduled class the week after the simulation exercises. The consent informed the subjects that allowing researchers to review and score their videotaped simulation performance would not impact their clinical

or theoretical grades. The consent also stated that only those that agreed to participate would have their data included in the study, and they could choose to withdraw from the project at any time without any repercussions (see Appendix I and J). Contact information for the primary researcher (PR), supporting dissertation faculty, Dr. D. Alfred Ph.D. RN, and UT-Tyler IRB chairperson, Dr. G. Duke Ph.D. RN, was also provided. The signed written consents were kept in the primary researcher's (PR) office in a locked file cabinet.

At the conclusion of the simulation exercises, each group was asked to complete the SET-M survey, which gathers information about their perceptions of the simulation experience. The participants were informed about the purpose of the SET-M and were required to consent to the survey before rating the instrument's statements and responding to demographic questions. The instrument was delivered using Qualtric software, permission to use this software was obtained from the University of Texas at Tyler Office of Assessment and Institutional Effectiveness. The SET-M data set was downloaded to the PR's personal computer for analysis after receiving online consent from the study's subjects. The computer was maintained at the PR home and is password protected.

The Creighton Competency Evaluation Instrument (CCEI) was used in this study to score the participant's performance during a simulation scenario. After informed consent was obtained from the participants, the CCEI scoring process was initiated. The participants were assigned a code such as Sim1 Student A, by the evaluators during the grading process. These records were maintained in a locked file cabinet in the PR's office. After the sample was scored, a member of the teaching faculty identified each

student with the PR to ensure that each participant's scores were correctly assigned. The students CCEI scores were then manually inputted into an Excel spreadsheet, reviewed for accuracy, and then uploaded into SPSS 25 software for analysis. All the data was maintained on the researcher's password-protected laptop.

Instruments

Creighton Competency Evaluation Instrument (CCEI)

The CCEI was used to score the clinical judgment of the students who were assigned the role of the registered nurse during the simulation scenario. The CCEI is a quantitative tool that consists of 23 items that are divided into four subscales: assessment, communication, clinical judgment, and patient safety (Hayden et al., 2014). The grading for the 23 items is 0 = does not demonstrate competency, 1 = demonstrates competency or not applicable (NA). Examples of CCEI scoring items include the interpretation of vital signs and prioritizes appropriately (see Appendix D).

The CCEI was developed from an existing instrument, the Creighton Simulation Evaluation Instrument (C-SEI), which was originally developed by nursing educators at Creighton University to evaluate students' performance in simulation. The instrument was based on four core competencies identified by the AACN that included assessment, communication, critical thinking, and technical skills (Todd et al., 2008). The initial testing of this instrument included content validity, which consisted of a literature review and an expert panel's evaluation. Inter-rater reliability on the 22 items ranged from 62.5% to 100%, and the overall reliability of the subscales ranged from 84.4 – 89.1 percent. Adamson, Gubrud-Howe, Sideras, and Lasater (2012) reviewed multiple studies that utilized the C-SEI and reported an interclass correlation (2,1) = 0.889 and agreement

percentages ranged from 92 – 96 percent with two raters. These researchers also performed additional reliability testing and reported a Cronbach's alpha of 0.979 (Adamson et al., 2011).

The National Council State Boards of Nursing (NCSBN) researchers modified the C-SEI to clarify scoring and incorporate Quality and Safety Education for Nurses (QSEN) measures for the national simulation study (Hayden et al., 2014). The wording on the instrument was also revised to make it usable in the clinical setting as well as simulation activities. Nursing faculty with a minimum of six years in education from three Baccalaureate Schools of Nursing (BSN) and two Associate Degree Nursing programs (ADN) participated in the evaluation and testing of the CCEI. Content validity was determined using a questionnaire that was evaluated by 35 educators who scored each item from strongly agree = 1 to strongly disagree = 4 (Hayden et al., 2014). The study's sample agreed that each item should be included in the tool (M=3.89, SD=0.19) and indicated that most behaviors were easy to understand (M=3.78, SD=0.27). To evaluate the instrument's reliability, the researchers had an additional 31 participants, review a simulation scenario at three different levels of proficiency, and grade the simulations using the CCEI. The researchers then compared the inter-rater reliability of the study participants to an expert rater. The overall agreement between the two groups was 79.4%, and the Cronbach's alpha for each category was above 0.90 (Hayden et al., 2014).

For this research, the project evaluators scored each student assigned the role of the RN by consensus using the CCEI as described in the procedures section. The overall and subscale scores were manually inputted into an Excel spreadsheet, reviewed for

accuracy, and then downloaded into SPSS 25 software for analysis. A Cronbach's alpha was calculated for each sub-scale based complete scores, meaning that each item within the scale received a score in order to be included in the calculation (see Table 3). A Cronbach's alpha for the total scale could not be calculated because at least two students were assigned the role of RN in the simulation, and therefore the students were not able to be scored on all the items of the CCEI. The low Cronbach's alphas that resulted are a limitation of this study.

Simulation Effectiveness Tool – Modified (SET – M)

The Simulation Effectiveness Tool – Modified (SET-M) was used to explore students' perceptions of online prebriefing exercises and its impact on their readiness for simulation. This instrument was developed in 2005 to evaluate the effectiveness of the simulated clinical experiences and to assess students' perceptions of how well simulation met their learning needs. The original tool began with 20 items that represented three categories; attitude, learning, and confidence. The original instrument was scored with a 5 point ordinal scale, 1 = strongly disagree to 5 = strongly agree. However, some of the items had low total correlation scores, and one item required reverse scoring (Cordi, Leighton, Ryan-Wenger, Thomas, & Ravert, 2012).

Additionally, the researchers also had concerns about the construct validity of the items in the attitude category (Cordi et al., 2012). Based on an exploratory factor analysis, the instrument was reduced to a 13 item tool that used a 3 point ordinal scale to measure simulation effectiveness. The three-point ordinal range is 0 = does not agree to 2 = strongly agree.

The instrument was tested again with 654 prelicensure nursing students from six nursing programs, who represented different courses and levels within their program. The inclusion criteria for the sample involved participation in one or more high-fidelity simulations within the past three semesters. The students completed the SET within 24 hours of their final simulation of the semester (Cordi et al., 2012). The 13 items were loaded onto two factors, becoming the confidence and learning subscales. The overall Cronbach's's alpha = 0.93, with confidence subscale $\alpha = 0.88$ and learning subscale $\alpha = 0.87$, demonstrating acceptable internal consistency (Cordi et al., 2012).

The SET was updated in 2015 to be more consistent with INACSL's best practice standards and Quality and Safety Education for Nurses (QSEN) practices. The modified instrument consists of 19 items that include prebriefing and debriefing statements (see Appendix F). The scoring continues to use a three-point ordinal scale, 0 = do not agree, 1 = somewhat agree, and 2 = strongly agree. The modified SET was re-tested at two baccalaureate nursing programs by 1,288 students who participated in the simulation scenarios. An exploratory factor analysis was conducted using the unweighted least-squares approach for factor extraction (Leighton, Ravert, Mudra, & MacIntosh, 2015). The researchers also used a varimax rotation that resulted in a four-factor solution, confidence, debriefing, prebriefing, and learning. The internal consistency values for each factor were reported as prebriefing $\alpha = 0.833$, learning $\alpha = 0.852$, confidence $\alpha = 0.913$ and debriefing $\alpha = 0.908$ (Leighton et al., 2015). The SET-M was then divided into three subscales, prebriefing, scenario, and debriefing. The scenario subscale is comprised of the learning and confidence factors because these items reflected elements of nursing care that are demonstrated during the simulation scenario (Leighton et al.,

2015). The overall reliability for the instrument is α = 0.963 (Leighton et al., 2015). The SET-M demonstrates acceptable levels of internal consistency.

At the end of this study's activities, the participants were asked to complete the SET-M, which provided feedback about their perceptions of the simulation experience. The instrument was delivered using Qualtric software, and the students were required to give consent before scoring the tool. The data was directly uploaded into an SPSS 25 file, and Cronbach's alphas for each scale was calculated to determine the reliability of the instrument before any conclusions were drawn. The overall SET–M scale had a Cronbach's alpha (α) = .938, and the three subscales each demonstrate a Cronbach's α >.75. According to Bannon (2013) a Cronbach's alpha rating of 0.70 or higher is considered acceptable and indicates that the scale has reliability (see Table 3).

Table 3 Instrument Description and Reliability Scores

Scale	Control Group		Experimental Group		Cronbach's Alpha
	M	SD	M	SD	
Creighton Comptency Evaluation Instrument					
Overall Scale	.71	.12	.70	.17	
Assessment subscale	.61	.34	.39	.31	.527
Communication subscale	.91	.15	.97	.21	.135
Clinical Judgment subscale	.69	.21	.70	.19	.481
Patient Safety subscale	.69	.16	.75	.21	.019
Simulation Effectivness Tool – Modified					
Overall scale	53.71	5.76	53.43	6.86	.938
Prebriefing subscale	5.42	.92	5.84	.44	.755
Scenario subscale	33.55	4.43	32.84	6.42	.938
Debriefing subscale	14.65	1.25	14.76	.83	.891

Pilot of Intervention

A pilot was conducted to evaluate the mechanics of using a learning management system (LMS) to deliver the prebriefing exercises to the participants. It was not necessary to obtain permission from the University of Texas at Tyler Institutional Review

Board to conduct the pilot as the researcher was evaluating the implementation of an educational strategy. The sample was comprised of 90 students who were in the third semester of the Associate Degree program at the junior college. The sample was a mix of traditional and vocational nursing students who were pursuing registered nursing (RN) licensure. The junior college does not grade the active simulation scenario, and therefore, there was no academic risk for these students.

On the first day of the pilot, 45 students received the online prebriefing exercises. At the beginning of the exercises, the students completed an online quiz about the care of the patient with burns. The students were then divided into groups of 4 or 5 for the simulation exercises. As the students entered the simulation lab, they were instructed to individually watch an online video orientation to the lab and equipment as well as a hands-off patient report. The students were then given 5 minutes to review the patient's online chart, followed by five multiple-choice questions that utilized wording form Tanner's Model of Clinical Judgment, included noticing and significant. The group was then granted an additional five minutes to create an anticipatory plan. The simulation instructors closely monitored each group to ensure they stayed within the allotted time. After participation in the scenario, the students took part in a debriefing session with the faculty. At the end of the simulation exercises, the students were asked to complete the Simulation Effectiveness Tool – Modified survey online to gather their perceptions of the online prebriefing exercises. The participants were required to consent to the survey before scoring the items, which was delivered using Qualtric software.

On the second day of the pilot, a second group of 45 students participated in the simulation exercises. However, this group of participants received traditional prebriefing

exercises instead of online activities. The traditional prebriefing exercises included a face to face orientation to the lab, equipment, and a hands-off patient report from the simulation faculty. The students were then given a total of 10 minutes to review the patient's paper chart and create an anticipatory plan. Following participation in the scenario, the students were debriefed by simulation faculty. These students were also surveyed using the SET-M to explore their perceptions of the prebriefing exercises.

The pilot provided the opportunity to assess the ability of the LMS to deliver online prebriefing modules. Lessons learned included determining the need for a hyperlink to the online videos instead of loading them directly into the student's online course. During the pilot, the online videos were slow to load and would often pause during the viewing, which resulted in delays in the simulation lab. Placing the online video in a streaming platform, facilitated the delivery in a timely manner, which kept the students moving through the simulation exercises. To ensure that only students in the experimental group would have access to the online prebriefing content, a password to access the videos was added. In addition, the researcher learned that a faculty member needed to be present in the lab to assist and monitor students as they watched the online prebriefing exercises.

The students' feedback was gathered anonymously and analyzed using SPSS 25 software.

Table 4 Prebriefing Feedback from Pilot (n=90)

Item Statement	Scoring (%)	Control Group	Experimental Group
Prebriefing increased my confidence	Strongly agree	82.2	66.7
	Somewhat agree	17.8	31.1
	Do not agree	0	2.2
Prebriefing was beneficial to my learning	Strongly agree	86.7	75.6
	Somewhat agree	13.3	17.8
	Do not agree	0	6.7

An independent t-test for samples was used to examine the difference between the mean prebriefing subscales scores of the two groups. On average the control group, (M = 5.68, SE = .09) scored the prebriefing items as more beneficial than the experimental group (M = 5.37, SE = .14). This difference, .08, BCa 95% [-.04 - .66]. was not significant t (88) = 1.78, p = .078. Students were also able to comment on the simulation exercises within the SET-M survey. Overall, the students' comments regarding the online prebriefing exercises were positive, despite the difficulties with the slow video delivery.

Interrater Reliability

Interrater reliability exercises using the Creighton Competency Evaluation Instrument (CCEI) were conducted prior to the scoring for the research study. The three evaluators, which included the primary researcher, watched videotapes of senior-level students participating in a simulation scenario about the care of a patient with a cardiac dysrhythmia. The junior college does not grade the students during the simulation scenario, which eliminated any academic risk. The three evaluators had reviewed the scenario and determined what would constitute competency for each item on the CCEI before scoring the participants. In a classroom at the junior college, the three evaluators viewed eight simulations together. According to the Portney and Watkins (2015), best practices for interrater reliability include having the scorers grade the subject during a single viewing so that the participant is viewed simultaneously and independently, which contributes to consistent scoring. After each participant's simulation performance was graded using CCEI, the evaluators discussed the scores and came to a consensus.

Intervention Description

The research study began after receiving IRB approvals from the University of Texas at Tyler and the junior college (see Appendix D and E). The control group (n=31) participated in the simulation exercises on March 6th and the experimental group (n=37) on March 7th, 2019. The first part of the simulation exercise was the same for each group. The participants began the pre-simulation activities by completing a ten-question multiple-choice online quiz to assess their theoretical knowledge of how to care for a patient with a lower leg thrombus. The Moodle learning management system (LMS) was utilized to deliver the exam. The students were given one opportunity to take the quiz. The students were immediately able to see their scores and identify which questions were answered correctly. The LMS did not provide the correct answers for incorrectly answered questions.

Control Condition Procedures

Following the quiz, the control group was broken into smaller groups of two or three students who were then rotated to the simulation lab. At the beginning of each prebriefing session, the participants were given a verbal orientation to the lab and the simulator plus a hand-off patient report by the nursing faculty. The students were then given five minutes to review the patient's paper chart and create an anticipatory plan of care. The clinical instructors who oversaw the simulations used a timer to ensure each group of students only received five minutes to prepare. The students then entered the simulated hospital rooms and began to participate in the scenario. The clinical instructors used the same script for each group, and the lab rooms were re-set at the end of each scenario so that the initial scene was identical for each group. The simulations were

recorded using the lab's video equipment; each group was labeled by a designated faculty member to deidentify the participants.

Following the simulation scenario, the students immediately returned to the computer lab and completed a second 10 question multiple-choice quiz based on the scenario. The quiz was also delivered using the Moodle LMS platform. The students were able to see their scores and identify which questions were answered correctly. Correct answers to incorrectly answered questions were again not provided. The participants then moved to a classroom for debriefing by the clinical faculty who directed the scenario. Students were debriefed using the Debriefing for Meaningful Learning (DML) technique. At the end of all simulation activities, the students completed the Simulation Effectiveness Tool–Modified (SET-M) survey that also included demographic questions. A description of the survey was provided, and each student was required to give consent before answering questions. The consent informed the participants that their answers were anonymous, and the information obtained would be used to explore students' perceptions of prebriefing and their simulation learning experience. The survey was delivered online using Qualtric software. A total of 31 responses to the survey were obtained.

Experimental Condition Procedures

The experimental group (n= 37) participated in the simulation exercises on March 7th, 2019. This group also began their pre-simulation activities by completing the same 10 question multiple-choice quiz as the control group, regarding the care of a patient with a lower leg thrombus. This quiz was delivered online using the Moodle LMS; students were able to view their scores in the online grade book and correctly answered questions

were identified. The learning system did not provide correct answers for incorrectly answered questions. Following the quiz, the students were divided into smaller groups of two or three and were rotated into the computer lab for prebriefing exercises. A faculty member was present in the lab to supervise the students but did not answer questions related to the simulation scenario's content. The students individually watched a video orientation to the simulation lab and simulator as well as a hand-off patient report via the LMS. The next stage involved the participants reviewing the patient's chart online and answering five multiple-choice questions about the patient that incorporated wording from Tanner's Model of Clinical Judgment. The additional five multiple-choice questions were part of the structured online prebriefing exercises designed to promote the students' clinical judgment and were unique to the experimental group.

Table 5 Prebriefing Questions and Results (n=37)

Prebriefing Question	# Correct Answers	(%)
What key lab did you notice for this patient?	26	70.3
What key piece of information did you notice during the during the report?	26	70.3
What nursing interventions should be included in the patient's plan of care? Select all that apply.	35	94.6
Which assessment is the highest priority for the nurse caring for this patient?	16	43.2
What do you think is this patient's priority problem?	19	51.4

After the online prebriefing exercises, the students moved to the simulation lab and were allotted five minutes to make an anticipatory plan of care. The clinical faculty who facilitated the simulations timed the students to ensure no group received more than five minutes of preparation. Immediately following that, the groups of students entered the simulated hospital rooms and began to participate in the scenario. These simulations were also videotaped using the lab's equipment, and a designated faculty member labeled

each simulation to deidentify the participants. The same script was used throughout the study. At the end of the scenario, the students returned to the computer lab and answered the same ten-question post-simulation quiz as the control group. The students were then debriefed in a classroom by the nursing faculty who directed the simulation using the DML method.

At the end of the simulation exercises, the participants completed the SET-M survey that included demographic questions using Qualtrics software. The students were required to consent to the survey before scoring the instrument. The consent informed the participants that their answers would remain anonymous and would assist educators in better understanding nursing students' perception of prebriefing and simulation-based learning experiences.

Table 6 Data Collection and Study Procedures

	Control Conditions	Experimental Conditions
Presimulation activity	10 item multiple choice quiz	10 item multiple choice quiz
Prebriefing exercise	Face to face orientation to the lab and a verbal hand-off patient report.	Online video orientation to the lab, hand-off patient report watched individually
Simulation Scenario	Given 5 minutes to review the patient's chart make an anticipatory plan Videotaped – scored by consensus using CCEI	5 item multiple choice quiz Given 5 minutes to review the patient's chart make an anticipatory plan Videotaped – scored by consensus using CCEI
Post simulation scenario	10 item multiple choice quiz	10 item multiple choice quiz
Debriefing session	Debriefing for Meaningful Learning with faculty	Debriefing for Meaningful Learning with faculty
Completion of all simulation activities	SET-M survey and demographic data collection	SET-M survey and demographic data collection

Study Scoring Procedures

The sample's videotapes were transferred to the junior college's video storage drive by a technician from the college's IT department who removed the date stamp from each recording. This intervention blinded the three scorers as to which group received traditional prebriefing and which received structured online prebriefing exercises. The three evaluators, which included the primary researcher (PR), thoroughly reviewed the CCEI with the clinical instructors before beginning the grading process to determine what actions would constitute competency for each scale item. The students who

demonstrated or verbalized the required actions were scored as competent. The evaluators and faculty noted that on some scale items, it would not be possible to give competency scores to both students assigned the role of the RN. For example, only one student is able to call the healthcare provider and give a report using the SBAR format. Given this limitation, the evaluators and faculty decided that participants should not be penalized for an action they were not able to perform, and therefore, some students received a not applicable (NA) score on certain items.

Two weeks after the completion of the simulation exercises, the PR and two evaluators began watching the videos and scoring the subjects who were assigned the role of the RN using the CCEI. At least two students were assigned the role of the RN in every simulation. The scorers watched the videotapes together in a classroom at the junior college over the course of six weeks. The participants were scored by consensus, and the PR collected and maintained the scoring records after each session was completed. A total of 68 students were scored, 31 from the control group, and 37 from the experimental group.

Once the scoring was completed, the PR and a member of the teaching faculty re-identified each student in the scenarios. The re-identified students were then assigned a code using letters and numbers, for example, AA001 for those in the experimental group and BB001 for those in the control group. The students' scores from the CCEI were manually inputted into an EXCEL spreadsheet and then uploaded into SPSS software for analysis.

Data Analysis

The research focused on the impact of online vs. traditional prebriefing activities on students' clinical judgment scores. Several statistical tests were employed to evaluate the data. A t-test for independent samples was utilized to examine the differences between the control and experimental groups regarding the CCEI mean scale scores and the pre-simulation and post-simulation quiz scores. The participant's feedback that was collected from the SET-M survey was analyzed using frequency counts and t-tests for independent samples. The last item on the SET-M survey provided the students with the opportunity to share their perceptions of the simulation experience. These written responses were reviewed and thematically coded. Similar codes were then grouped into categories for interpretation.

Procedures to Enhance control

Several procedures were implemented to minimize threats to the study's internal and external validity. The project was limited by the use of a convenience sample of sixty-eight students from a junior college. Although the researcher was able to recruit and consent the entire cohort of students, the study was underpowered. The lack of power threatens the statistical validity of the study and the generalizability of the results (Portney & Watkins, 2015). However, simulation research is often impacted by access to a sample, which is limited by the school's enrollment capabilities. Several nursing researchers have documented that their research was limited by the use of a convenience and or a small sample (Beman, 2017; Lindsey & Jenkins, 2013; Mariani et al., 2013; Page-Cutrara & Turk, 2017).

The study's sample is comprised of a cohort of junior-level students from one junior college. The students are randomized into two sections by the program coordinator for the associate degree program at the beginning of the program. The students are assigned to a section for an entire academic year, and this could not be changed for research purposes. This initial randomization, however, helped to promote equality in the groups as each student had the same opportunity to be in either the control or experimental group, which contributed to the study's validity. However, the internal validity of the study could have been impacted by social threats that arise from the use of two groups. A social threat involves the members of one group becoming aware of the circumstance of the second group, which can influence the study's findings (Portney & Watkins, 2015). To reduce this potential threat, the control group received the traditional prebriefing exercises on the first day of the study, and the experimental group received the structured online prebriefing exercises on the project's second day, which minimized the sharing of information between the groups.

Several procedures were also implemented during the simulation scoring process to reduce threats to the study's internal validity. The primary researcher, a faculty member who does not teach the students, and a nurse educator from a local hospital scored the participant's simulation performance. All three evaluators have Master's degrees in Nursing Education, completed CCEI training, and participated in pilot grading sessions (see Appendix K). According to Portney and Watkins (2015), the establishment of inter-rater reliability contributes to greater consistency amongst the evaluators, and the subjects' scores are more likely representative of their true score. In addition, using three individuals who are not familiar with the students to grade the simulation performances

reduced the threat for rater bias (Portney & Watkins, 2015). The evaluators watched videotapes of the participant's performance together in a classroom at the junior college, allowing the scorers to grade the exact same performance simultaneously and independently. The implementation of these procedures contributed to the study's validity.

The study's sample is comprised of a cohort of associate degree nursing students from a junior college in North-East, Texas. Eighty-five percent of the sample self-identified as Caucasian, and 85.3% are female students. According to the National Nursing Workforce study (2017), 36.4% of all newly registered nurses indicated their initial education was from an associate degree program and 80.8% of RN's self-identity as caucasian (Smiley et al., 2019). The study's demographics demonstrate similarities to estimated population values from the NCSBN 2017 Workforce study, which enhances the generalizability of the results.

The study also explored the impact of prebriefing exercises on students' knowledge. Each group completed a 10-question pre-simulation quiz on the care of a patient with a lower leg thrombus to establish the participant's and group's baseline knowledge. Following participation in prebriefing and the active simulation scenario, the students all took a second 10 item quiz about the care of the patient in the simulation scenario. The use of two different quizzes reduced the ability of the study to evaluate the student's learning. A pretest-posttest design would have allowed for much better comparisons of the impact of simulation and prebriefing exercises on student learning.

Results

Hypothesis One (Ha1)

The first research hypothesis stated that the clinical judgment of the prelicensure nursing students who received a structured online prebriefing exercise before an active simulation scenario would be stronger than the clinical judgment of the students who received a traditional face to face prebriefing activity. A two-tailed independent *t*-test was used to examine the differences between the groups' mean percentage scores on the Creighton Competency Evaluation Instrument (CCEI).

The CCEI is a 19-item tool that contains four subscales: assessment, communication, clinical judgment, and patient safety. The instrument scores each item as 1 = demonstrates competency, 0 = does not demonstrate competency or NA = not applicable. Once all the scoring was complete, the researcher and a faculty member re-identified the students to ensure the CCEI scores were assigned to the correct participant for analysis. The students were assigned a code for the data analysis process, for example, AA001 for the first student in the experimental group and BB001 for the first student in the control group. The CCEI scores were manually inputted into an EXCEL spreadsheet and thoroughly reviewed for accuracy. EXCEL software was used to calculate subscale and total instrument scores for each participant. The items that were scored as not applicable (NA) were not included in the scale calculation. To accurately reflect the students' performance, a mean percentage score was calculated for each participant's subscale and total score. The data set was then uploaded into SPSS 25 for analysis.

Frequency counts for the sample, control group, and experimental group were first used to determine the number of cases for each item, subscale, and total instrument score. All the cases were carefully scrutinized for missing data, repetition of numerical values, and accuracy of data entry before the statistical analysis was initiated. One item within the CCEI was scored as does not demonstrate competency for all participants. The item measured the participant's ability to document patient findings during the simulation. The junior college does not currently have the equipment for computer documentation in the lab setting. This item was removed from the data set before statistical tests were conducted.

The study variables were then tested in both groups to ensure all assumptions were met prior to analysis. A visual inspection of frequency distributions using stem and leaf plots, Q-Q plots, boxplots, and histograms did not demonstrate outliers for any of the study variables.

The overall and subscale mean percentage scores for both the control and experimental groups were examined for normality. A Shapiro-Wilk statistical test which compares the sample's distribution of scores to a set of normally distributed scores with the same mean and standard deviation was used to determine if the scores were normally distributed (Fields, 2013). According to Bannon (2013), a Shapiro – Wilks test is more appropriate when examining small sample sizes for normality. The Shapiro-Wilk test for the experimental group's total mean CCEI percentage scores, W (37) = .943, p = .058, and the control group's scores W (31) = .943, p = .103, were not statistically significant. The distribution of the CCEI percentage scores was negatively skewed and demonstrated a light-tailed and platykurtic distribution. This type of distribution is relatively flat in

comparison to a normal distribution and illustrates a buildup of higher scores within the data set (Salkind, 2014). Z-scores for skewness and kurtosis were calculated for each scale and examined for significance. The z-scores for skewness and kurtosis for overall CCEI percentages scores were not statistically significant at $p < .05$.

The assessment, communication, clinical judgment, and patient safety percentage subscale scores were all negatively skewed with platykurtic distributions. The skewness and kurtosis z-scores for the assessment, clinical judgment, and patient safety subscale were all less than 1.96 at $p < .05$ and were not significant. The communication subscale percentage z-scores for skewness, $z = 5.47$ and the kurtosis scores $z = 3.026$, are significant at $p < .05$. This analysis indicated that the communication subscale data set contained a large number of high scores and was not normally distributed.

The Shapiro-Wilk tests for normality were also performed on the CCEI overall and subscale scores.

Table 7 CCEI Shapiro-Wilks Normality Test Results

CCEI Instrument Scales	Control Group	Experimental Group
Overall scale	$W(31) = .943$, $p = .103$	$W(37) = .944$, $p = .062$
Assessment subscale	$W(31) = .868$, $p = <.001$	$W(37) = .875$, $p = <.001$
Communication subscale	$W(31) = .636$, $p = <.001$	$W(37) = .625$, $p = <.001$
Clinical Judgment subscale	$W(31) = .959$, $p = .269$	$W(37) = .943$, $p = .059$
Patient Safety subscale	$W(31) = .886$, $p = .003$	$W(37) = .901$, $p = .003$

The Shapiro-Wilks test for the overall CCEI percentage scores and the clinical judgment subscale percentage scores indicated normal distribution for both the control and the experimental groups. However, the assessment, communication, and patient safety subscale percentages scores are all significantly non-normal, limiting the generalizability of the study's results.

An independent t-test was conducted to examine the differences between the mean percentage total and subscale scores of the control and experimental groups. The overall CCEI mean percentage score for the control group was higher (M = .716, SE = .022) than the experimental group (M = .705, SE = .028). This difference, .011 BCa 95% CI [-.06 - .08] is not significant t (66) = .299, p = .76. The communication mean percentage score for the control group was higher (M = .908, SE = .027) than the experimental group (M = .877, SE = .034). This difference, .03 BCa 95% CI [-.06 - .12] is also not significant t (66) = .675, p = .50. The mean patient safety percentage score for the control group was lower (M = .686, SE = .029) than the experimental group (M = .744, SE = .034). This difference, -.058 BCa 95% CI [-.15 - .03] is again not significantly different t (66) = -1.25, p = .214. The mean percentage clinical judgment score for the control group was also lower (M = .687, SE = .038) than the experimental group (M = .701, SE = .031). This difference, -.014 BCa 95% CI [-.11 - .08] is not significant t (66) = -.287, p = .775. However, the mean assessment percentage scores for the control group is higher (M = .61, SE = .061) than the experimental group's mean score (M = .398, SE = .052). This difference, .21 BCa 95% CI [.05 - .37] is statistically significant t (66) = 2.64, p = .01 and represents a medium effect size, d = 0.64 (Fields, 2013).

Hypothesis Two (Ha2)

Knowledge quizzes were administered to the nursing students at the beginning of the simulation exercises. The 10 multiple-choice questions were designed to evaluate the student's theoretical knowledge prior to participation in the simulation exercises. An independent t-test was used to explore the difference between the control and experimental groups. On average the control group (M = 8.81, SE = .23) scored higher

than the experimental group (M = 8.32, SE = .17). This difference, .49 BaC 95% CI [-.06 – 1.05], is not statistically significant t (66) = 1.76, p = .08. Directly after participation in the scenario, the students answered a second 10 item multiple choice quiz about the care of the simulated patient in the computer lab. On average, the control group, (M = 7.85, SE = .22) scored higher than the experimental group, (M = 7.58, SE = .17). These differences, .26 BaC 95% CI [-.29 – .82], were also not statistically significant, t (66) = .95, p = .35.

Research Questions

The Simulation Effectiveness Tool – Modified (SET-M) was completed by the participants at the end of the simulation exercises to gather their perceptions of the experience. The instrument contains 19 items that are broken into three subscales (1) prebriefing, 2 items, (2) scenario, 12 items, and (3) debriefing, 5 items. The tools' statements are scored as 3 = strongly agree, 2 = somewhat agree, and 1 = do not agree. The survey was completed anonymously by the students using Qualtric software; the data from the control and experimental group were gathered separately for comparison. The data was transferred from Qualtric's directly into an SPSS 25 file for analysis. All cases were carefully scrutinized for missing data, repetition of numerical values, and accuracy of data entry before the statistical analysis was initiated.

The SET-M contains two items specific to the participant's prebriefing experiences; all 68 students scored this subscale.

Table 8 SET-M Prebriefing Results (n=68)

Item Statement	Scoring (%)	Control group	Experimental Group
Prebriefing increased my confidence	Strongly agree	74.2	91.9
	Somewhat agree	25.8	8.1
	Do not agree	0	0
Prebriefing was beneficial to my learning	Strongly agree	77.4	91.9
	Somewhat agree	22.6	8.1
	Do not agree	0	0

An independent t-test was performed to examine differences between the means of the control and experimental groups. On average the experimental group (M = 5.84, SE = .07) scored the prebriefing items as more beneficial than the control group (M = 5.42, SE = .17). This difference, -.42 BaC 95% CI [-0.78 – -0.53], was statistically significant t (66) = -2.45, p = 0.03 and has a medium effect size d = 0.64.

Frequency counts for the scenario subscale indicated that one participant from the experimental group did not score any items in this section. Also, scenario item number 11, "I am more confident in my ability to teach patients about their illness and interventions," is missing 2 cases; both are from the experimental group. One participant from the control group failed to score the statement. "I developed a better understanding of medication." Therefore, a total of 65 valid cases (95.6%) were included in the analysis. An independent t-test was used to examine the difference between the means of these two groups. On average the control group (M = 33.54, SE = .79) scored the scenario activities higher than the experimental group (M = 32.84, SE = 1.06). This difference, 0.71, BaC 95% CI [-2.01 – 3.44], was not statistically significant t (66) = .052, p = 0.6.

The two groups scores for the debriefing subscale was also examined using an independent t-test. On average the experimental group (M = 14.76, SE = .14) scored the

debriefing activities higher than the control group (*M* = 14.65, *SE* = .23). This difference, -.11, BaC 95% CI [-0.32 – 0.39], was again not statistically significant *t* (66) = -0.44, *p* = 0.66. Lastly, the overall scores for the SET- M were explored for differences. On average the control group's (*M* = 53.71, *SE* = 1.04) overall score was higher than the experimental group's (*M* = 53.43, *SE* = 1.13). This difference, .028, BaC 95% CI [-2.83 – 3.38], was not statistically significant *t* (66) = 0.18, *p* = 0.86.

The nursing faculty at the junior college asked the students for feedback about their simulation experience at the end of the exercises, which provide a means for student reflection and gathers information about improving student learning activities. The data was gathered anonymously using Google forms software. The instrument has a place titled additional comments, which allows students to give feedback freely. Seventeen students (45.9%) from the experimental group choose to add comments about the on-campus simulation day. The responses were reviewed and coded according to themes. All the comments were positive about the simulation and lab activities, and 64.7% of the responses referenced the prebriefing exercises. Three themes emerged from the analysis, liked the video report, felt more prepared, and felt less anxious. The students who choose to give feedback indicated that receiving the online report gave them time to make notes and gather their thoughts, which in turn helped them to feel more prepared and less anxious for the simulation. These students also reported that they "liked the simulation set up" and felt it contributed to their learning. The control group also had the opportunity to comment anonymously about the simulation activities on the faculty survey. Eleven responses were obtained, and of those, seven replied, "no" or "not applicable (NA)." With regards to the prebriefing exercises, only one response was

noted, the student indicated they felt “rushed” to review the chart before entering the active simulation scenario.

Discussion

The purpose of this study was to explore the effect of a structured online prebriefing activity on prelicensure nursing students’ clinical judgment during a simulation exercise. The study examined the participant's clinical judgment during an active simulation scenario using the Creighton Competency Evaluation Instrument (CCEI) and gathered feedback from the students about the prebriefing exercises. Knowledge about the contribution of online prebriefing exercises could assist nursing faculty in the development of prelicensure nursing students’ clinical judgment, a skill that is critical in today's fast-paced and complex healthcare environment.

Prebriefing is the first stage in the simulation process and is designed to assist learners in preparing for the simulation learning experience. According to INACSL’s Best Practices for Simulation Design (2016) and McDermott (2016), prebriefing exercises that include clear instructions to the equipment, lab, and learning outcomes is key to simulation success. The first hypothesis examined the differences between the clinical judgment of the prelicensure nursing students who received a structured online prebriefing exercise before an active simulation scenario in comparison to students who received traditional face to face prebriefing activities. An independent t-test ($p<.05$) was used to examine the differences between the mean CCEI scale and subscale scores of the two groups.

The experimental group’s mean clinical judgment subscale score was higher than the control group’s mean score. This result is supported by Page-Cutrara and Turk’s

(2017) research study that reported higher CCEI clinical judgment subscale scores for students who received a structured prebriefing exercise as compared to a group that did not. Kim, Noh, and Im's (2017) research study also documented that a three-step prebriefing exercise significantly improved student clinical competency scores as compared to groups that received only a one or two-step prebriefing activity, which further supported the study's findings.

However, the independent t-test did not show a significant statistical difference between the control and experimental groups. Clinical judgment is a multifaceted nursing skill that is impacted by the individual's knowledge, personal values, and prior clinical experiences (Tanner, 2006). The pre-licensure nursing students who participated in this study are first-year students and have limited clinical experiences to draw from, which impacts their decision-making abilities (Lasater, 2011). Although there is no significant statistical difference between the two groups of students, the online prebriefing exercise appears to have positively contributed to the participants' clinical judgment during the simulation exercise.

The experimental group also demonstrated higher patient safety subscale scores than the control group. The patient safety subscale examined the ability of the participant to implement safe nursing practices such as using patient identifiers and administering medication safely. The subscale is composed of 6 items and incorporates QSEN practices. On average, the experimental group's score was higher than the control groups. However, no significant statistical differences were noted. Nursing research has documented the ability of simulation exercises to engender patient safety practices and competencies in pre-licensure students (Berndt, 2014; Hayden, Smiley, Alexander,

Kardong-Edgren, & Jeffries, 2014). The difference between the mean score may be accounted for by the fact that 40.5% of the experimental group was working in healthcare at the time of the simulation exercises in comparison to only 32.3% of the control group. The real-life work experiences of participants in the experimental group included 3 certified nurse's aides, 4 scribes, 2 certified pharmacy technicians, a medical assistant at a clinic, a lab technician, and a paramedic. These work experiences foster the student's ability to implement patient safety practices routinely, and therefore, these behaviors may appear more consistently in the simulation setting.

In comparison, the control group's overall and communication subscale percentage scores were higher than the experimental group but again were not statistically significant. The lack of statistical difference between the two groups' overall mean scores indicated that the online prebriefing exercise was as effective as a traditional face to face session. This finding is supported by Chan et al. (2016), who reported no statistical differences in the clinical reasoning abilities of prelicensure nursing students participating in a web-based case study activity as compared to a group of students who received the content in a traditional face to face classroom setting.

The CCEI communication subscale is composed of five items. However, one of the items, documents clearly concisely and accurately, was removed from the scale during the data analysis. The junior college simulation lab does not have the ability to allow students to document during the simulation experience, and the item was deleted from the instrument during the analysis. Both groups' mean percentage scores were high, which indicated that all the participants were able to demonstrate strong communication skills with the patient, their peers, and the faculty member in the role of the healthcare

provider. According to the Best Practice Standards developed by INACSL (2016), prebriefing activities should include clear instructions and an outline of expectations that will help to set the stage for the participant's success. The orientation script instructed the students to treat the simulator like a real person, by talking to them and asking questions to gain more information. These instructions may have helped to set the stage for the learner's success with the communication scores. In addition, this finding is also supported by 61.7% of the sample reporting participation in 5 or more high fidelity (HF) simulations and 38.2% of the participants reporting participation in at least one HF scenario. The nursing students' previous experience with HF simulations may have also contributed to the high communication scores as the participants were aware of the need to communicate to obtain additional patient information and treatment orders.

The second hypothesis examined the impact of the students' participation in a post-simulation quiz on their theoretical knowledge of how to care for a patient with vascular insufficiency. Before participating in the prebriefing and simulation activities, the students took a 10-item multiple-choice quiz to gather a baseline understanding of their knowledge. The control group's mean scores were higher than the experimental group's score but were not statistically significant. This indicated that the two groups demonstrated a similar understanding of the care of patients with vascular insufficiency, which limited the confounding influence of knowledge on the independent variable, clinical judgment.

Immediately following participation in the simulation scenario, the students took a second 10 item multiple-choice test about the care of the patient with a lower leg thrombus. The control group's mean score was again higher than the experimental mean

score but not statistically significant. This result was not unexpected, given the control group's higher pre-simulation quiz score. According to nursing researchers, online clinical modules are a useful teaching strategy and can enhance students' clinical knowledge (Culyer et al., 2018; Forbes et al., 2016; Foronda, Godsall & Trybulski, 2013; Leigh & Steuben, 2018). The lack of statistical difference between the two group's post-simulation scores indicated that the sample demonstrates a similar understanding of what vascular insufficiency is and how to care for a patient with this diagnosis.

Research Questions

Data was also collected from the prelicensure nursing students about their experiences with prebriefing activities using open-ended questions at the end of the SET-M survey and the junior college's faculty survey. The overall feedback from the experimental group regarding the online prebriefing exercises was positive, and three key themes emerged, the students (1) liked the video report. (2) felt more prepared, and (3) reported feeling less anxious. In comparison, the control group had only one documented response, which was the student felt "rushed" during the face to face prebriefing exercise. This finding is supported by research regarding the current generation of student learners, generation Z.

Generation Z has been identified as students who were born between 1995 and 2012 (Chicca & Shellenbarger, 2018). This generation has never known a time without the internet and are avid consumers of digital technologies (Chicca & Shellenbarger, 2018; Shatto & Erwin, 2016). The sample consists of 38 participants who are 24 years of age or younger, 55.8% of the total sample. In addition, the mode values for both the experimental and control group is 20 years of age. The second-largest generation of

learners in the sample, 22 students, can be classified as millennials, the generation born between 1982 and 1995. This was the first generation to have computers in their schools and are often more engaged when using technologies for learning activities (Shatto & Erwin, 2017). These two groups extensively use and rely on technology for knowledge, communication, and interaction, which supports the students' positive comments about using an online platform for the prebriefing exercises. Dr. Shatto (2016) noted that new and innovative teaching strategies that combine technology with interactive exercises are needed to meet generation Z's learning needs.

The second research question asked, do prelicensure nursing students believe that the structured online prebriefing exercises contributed to their readiness for the simulation scenario? The structured online prebriefing exercises were comprised of a video orientation to the simulation lab, equipment, and a hand-off patient report, an online chart, and five multiple-choice questions that incorporated wording from Tanner's Model of Clinical Judgment (see table 5). The last stage of the prebriefing involved the participants being given 5 minutes to develop an anticipatory plan in the simulation lab. These structured activities are consistent with INACSL Best Practice Standards for Simulation. The SET-M survey responses show that 91.9% of the experimental group strongly agreed that the prebriefing exercises were beneficial to their learning compared to 77.42% of the control group. Also, 91.9% of the experimental group strongly agreed that the prebriefing exercises increased their confidence compared to 74.2% of the control group. These findings indicated that prelicensure nursing students valued structured online prebriefing and that these exercises contributed to their readiness for simulation. The results are supported by nursing research indicating that structured

prebriefing exercises promote student learning and increase self-confidence (Chamberlain, 2017; Kim, Noh & Im, 2017; Page-Cutrara & Turk, 2017). Leigh and Steuben (2018) also noted that high-quality prebriefing exercises provide participants with the necessary tools and instructions for a successful simulation learning experience. The use of online prebriefing exercises is not well studied, and gathering student feedback contributes to nursing's understanding of prebriefing's impact on student learning and readiness for simulation.

Additional Findings

Mean CCEI assessment scores between the control and experimental groups were significantly different. The control group's average score was higher than the experimental groups, and the analysis indicated a medium effect size. The control group's higher pre-simulation quiz score indicated that the group could demonstrate a better understanding of how to recognize and care for a patient with a lower leg thrombus, which may have contributed to the higher assessment scale scores. The assessment subscale examined the participant's ability to obtain pertinent data, perform follow up assessments, and evaluate the patient's environment. The control group's previous experience with high fidelity simulation could also contribute to the higher scores. According to the demographic data collected, 64.5% of the control group had participated in at least five high fidelity simulation experiences compared to 59.5% of the experimental group. Also, 32.3% of the control group reported working in healthcare when the study took place, which adds to their experiential knowledge base and may have contributed to higher scores. Although a significant difference between the two

groups was observed, many factors influence student test scores, and additional research needs to be conducted to understand the differences better.

Strengths and Limitations

The primary strength of this study was that it filled a gap in nursing literature about structured online prebriefing exercises and their impact on the development of prelicensure students' clinical judgment. Prebriefing is an understudied area of simulation that offers nursing educators another opportunity to facilitate students' clinical judgment (Chamberlain, 2015; INACSL, 2016; Leigh & Stubens, 2018; McDermott, 2016; Page-Cutrara & Turk, 2017). This study also contributes to nursing educators' understanding of the influence of simulation activities on associate degree nursing students' learning, a group that is not as well studied as baccalaureate students (Organization of Associate Degree Nursing (OADN), 2018). Additional factors that contributed to the study's strength include the quasi-experimental design which examined the cause and effect relationship of structured online prebriefing exercises and clinical judgment, the use of two instruments, the CCEI and the SET-M that have established reliability and validity and Tanner's Model of Clinical judgment as a theoretical framework.

One of the study's limitations was the use of a convenience sample. The sample was recruited from a limited geographical area, North-East Texas, and was primarily comprised of Caucasian females, 82.7%, which limited the generalizability of the results. However, NLN Biennial Survey of Schools of Nursing: Academic year 2017 – 2018 reported that 87% of all students enrolled in prelicensure nursing programs are female, and 69% of nursing students self-identified as Caucasian (NLN, 2018). The similarities

between the study's demographics and the NLN biannual survey allow for the dissemination of the results.

A second limitation of this study was the original randomization of the nursing students at the beginning of the program by the associate degree nursing program coordinator. The students were given a schedule for the entire academic year, which limited the researcher's ability to randomize the participants before the simulation exercises. The inability to randomize the sample limited the research design, making it quasi-experimental instead of experimental. This type of limitation is common in simulation research (Beman, 2017; Chamberlain, 2017; Dreifuerst, 2012; Page-Cutrara & Turk, 2017; Sharoff, 2015).

The study design allowed for two students to be in the role of the registered nurse during each scenario to meet time restrictions as the students were participating in simulation exercises during allotted clinical hours. The evaluators scored both students in the scenario to bolster the sample size, which was limited by the program enrollment. Although the entire cohort was recruited and consented to participate, the small number sample size impacted the reliability scores of the CCEI. The Cronbach's's alpha scored were calculated on complete scale scores, meaning that each participant had to be scored on all the items within the scale to be included in the calculation. With two students in the role of the registered nurse, the evaluators assigned not applicable (NA) scores on some items, as the student was not able to demonstrate the task because it had already been performed by the other participant. For example, both students could not call the healthcare provider (HCP) for orders within the simulation, and therefore the student who did not call the HCP was given an NA score (see Table 9).

Table 9. Cronbach's Alpha Reliability

Scale	Cronbach's's Alpha	No of items	No. of cases Included	% of total cases analyzed
Assessment	.527	3	48	70.6
Communication	.135	4	42	61.7
Clinical Judgment	.481	7	30	44.1
Patient safety	.019	5	34	50

The item-total statistics were examined for each scale to determine if removing an item would improve the Cronbach's alphas to an acceptable level of internal consistency of > .70 (Bannon, 2013). The removal of any items did not significantly impact the scales' reliability values. According to Fields (2013), Cronbach's alphas can be impacted by the number of items in the scale and number of cases being examined. The study's low Cronbach's alpha scores can be attributed to the smaller number of items within the scale and the small number of cases included in the calculation. This is a study limitation, and additional research studies will need to explore ways to manage this scoring challenge.

Future Recommendations

Prelicensure nursing programs are facing challenges that include faculty shortages and the decreasing availability of clinical spaces, which is limiting the ability to prepare students for real-world practice. Simulation activities provide students with hands-on learning opportunities that can support clinical development. Prebriefing, the first stage of simulation, offers educators an opportunity to examine the students' ability to gather information, analyze data, and create an anticipatory plan of care. To date, nursing simulation research has focused on students' perceptions of simulation, simulation design, and debriefing methodologies. This study examined the effectiveness of online prebriefing modules in facilitating students' clinical judgment and preparation for

simulation. Although the study demonstrated differences in clinical judgment scores between the experimental and control groups, more studies are needed to support this finding. One future research project could be to score the videos from this study using the Lasater Clinical Judgment Rubric (LCJR) and then contrast and compare the results from the two instruments. Both the LCJR and the CCEI contain a clinical judgment subscale, which allows for comparisons. This information could contribute to nursing's understanding of these instruments and their ability to objectively evaluate prelicensure students' clinical judgment abilities. In addition, studies with larger samples, baccalaureate students, and with students in different stages of prelicensure and graduate nursing programs are needed to evaluate and explore prebriefing's contributions to student learning, clinical judgment, and readiness for simulation.

Prebriefing activities contribute to prelicensure nursing students' simulation-based learning, as these students have little experiential knowledge to draw upon. Nurse educators need to continue to explore different exercises and teaching strategies to prepare students for simulation. Online modules, assignments such as care plans and concept maps as well as skill demonstrations could lessen students' anxiety while providing them with the necessary knowledge for simulation success. The current generation of student learners are avid users of technology; additional research that explores the use of online platforms to support simulation could also contribute to student success and at the same time, reduce congestion in the lab, allowing more students to participate. As nursing programs continue to the challenged by decreasing clinical space, prebriefing offers educators another setting to facilitate clinical skill and judgment, which contribute to readiness for practice.

Summary

Prelicensure nursing programs are facing challenges that include faculty shortage and the decreased availability of traditional clinical spaces. In addition, new nursing graduates are entering an increasingly complex and fast-paced healthcare environment where strong clinical judgment skills are essential to positive patient outcomes and safety. Simulation activities provide nursing programs with learning opportunities to help students develop practical skills, clinical judgment abilities, and gain valuable clinical learning experiences. Findings from the National Council of State Boards of Nurses National Simulation survey indicated that simulation use has increased significantly since the previous survey in 2010. According to Smiley (2019), 91% of associate degree and 89% of baccalaureate programs are using high-fidelity and or computer-based simulation experiences to teach clinical skills. The survey also reported that 60.9% of all registered nursing programs substituted simulation hours for traditional clinical time (Smiley, 2019).

Prebriefing, the first stage of the simulation process, offer educators another opportunity to facilitate students' clinical judgment. The results of this research found that structured online prebriefing exercises, which assisted the students to notice and interpret the patient's condition, contributed to their clinical judgment during a simulation scenario. The prelicensure nursing students also reported that prebriefing activities contributed to their confidence and were beneficial to their learning. This study supports nursing research, which has reported that well-designed prebriefing activities that provided participants with clear expectations, essential background information, and

orientation to the lab and equipment can reduce student anxiety, improve student performance and enhance learning.

This study paired an online learning platform with prebriefing simulation exercises, a combination that connected with today's generation of students, a group who are avid consumers of technology. The purposeful use of an online delivery system, which provided the participants with essential information and fostered their clinical judgment, contributed to the learning experience and helped to set the participants up for success. The relationship between simulation and prelicensure student nurses' clinical judgment development is complex. Further research is needed to study the impact of prebriefing exercises on nursing students' clinical judgment as well as the use of technology to support simulation-based learning.

References

Adamson, K. A., Gubrud-Howe, P., Sideras, S., & Lasater, K. (2012). Assessing the reliability, validity, and use of the Lasater clinical judgment rubric: Three approaches. *Journal of Nursing Education, 51*(2), 66-73. doi: 10.3928/01484834-20111130-03

American Association of College of Nursing. (2018). The essentials of baccalaureate nursing for profession nursing practice. Retrieved from http://www.aacnnursing.org/Portals/42/Publications/BaccEssentials08.pdf

Bambini, D., Washburn, J., & Perkins, R. (2009). Outcomes of clinical simulation for novice nursing students: Communication, confidence, clinical judgment. *Nursing Education Perspective, 30*(2), 79-82.

Bannon, W.M., Jr. (2013). *The 7 steps of data analysis: A manual for conducting quantitative research study.* Brooklyn, New York: Stats Whisperer Press.

Belief [Def. 1]. (n.d.). Merriam-Webster Online. In Merriam-Webster. Retrieved October 20, 2018, from https://www.merriam-webster.com/dictionary/knowledge

Beman, S., Litwack, K., Daley, B., Duchateau, T., & Morgan, S. (2017). *Evaluation of student competence in simulation following a prebriefing activity: A pilot study* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses.

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

Berndt, J. (2014). Patient safety and simulation in prelicensure nursing education: An integrative review. *Teaching and Learning in Nursing, 9*(1), 16-22. doi:10.1016/j.teln.2013.09.001

Brackney, D.E., & Priode, K.S. (2015). Creating context with prebriefing: A case example using simulation. *Journal of Nursing Education and Practice, 5*(1), 129 – 136. doi: 10.5430/jnep.v5n1p129

Burns, N., & Grove, S.K. (2009). *The practice of nursing research: Appraisal, synthesis, and generation of evidence.* St Louis, Missouri: Saunders – Elsevier.

Bussard, M.E. (2018). Evaluation of clinical judgment in prelicensure nursing students. *Nurse Educator, 43*(2), 106-108. doi: 10.1097/NNE.0000000000000432

Cant, R., & Cooper, S.J. (2014). Simulation in the internet age: The place of web-based simulation in nursing education. An integrative review. *Nurse Education Today, 34*, 1435 – 1442. doi: 10.1016/j.nedt.2014.08.001

Cappelletti, A., Engel, J., & Prentice, D. (2014). Systematic review of clinical judgment and reasoning in nursing. *The Journal of Nursing Education, 53*(8), 453-458. doi: https://doi.org/10.3928/01484834-20140724-01

Cardoso, A.F., Moreli, L., Braga, F.T., Vasques, C.I., Santos, C.B., & Carvalho, E.C. (2012). Effect of video on developing skills in undergraduate nursing students for the management of implantable central venous access ports. *Nurse Education Today, 32*(6), 709-713. doi: 10.1016/j.nedt.2011.09.012

Chamberlain, J. (2015). Prebriefing in nursing simulation. A concept analysis using Rodger's methodology. *Clinical Simulation in Nursing, 11*(7), 318-322. doi: 10.1016/j.ecns.2015.05.003

Chamberlain, J. (2016). Prebriefing: An equal to debriefing. *Journal of Preoperative & Critical Intensive Care Nursing, 2*(3), doi: 10.4172/2471-9870.1000125

Chamberlain, J. (2017) The impact of simulation prebriefing on perceptions of overall effectiveness, learning, and self-confidence in nursing students. *Nursing Education Perspectives, 38*(3), 119 – 125. doi: 10.1097/01.NEP.0000000000000135

Chan, A.W-K., Chair, S-Y., Sit, J. W-H., Wong, E. M-L., Lee, D, T-F., & Fung, O. W-M. (2016). Case-based web learning versus face to face learning: A mixed-methods study on university nursing students. *The Journal of Nursing Research, 24*(1), 31-40. doi: 10.1097/jnr.0000000000000104

Chicca, J., & Shellenbarger, T. (2018). Generation Z: Approaches and teaching-learning practices for nursing professional development practitioners. *Journal for Nurses in Professional Development, 34*(5), 250-256. doi: 10.1097/NND.0000000000000478

Chmil, J. V. (2016). Prebriefing in Simulation-Based Learning Experiences. *Nurse Educator, 41*(2), 64-65.

Coram, C. (2016). Expert role modeling effect on novice nursing students' clinical judgment. *Clinical Simulation in Nursing, 12*(9), 385-391. doi: 10.1016/j.ecns.2016.04.009

Cordi, V.L., Leighton, K., Ryan-Wenger, N., Thomas, J.D., & Ravert, P. (2012). History and development of the simulation effectiveness tool (SET). *Clinical Simulation in Nursing, 8*(6), e199-e210. doi: 10.1016/j.ecns.2011.12.001

Creswell, J.W. (2014). *Research design: Qualitative, quantitative and mixed methods approaches.* Thousand Oaks, California: Sage Publishing.

Culyer, L.M., Jatulis, L.L., Cannistraci, P., & Brownell, C.A. (2018). Evidence-based teaching strategies that facilitate the transfer of knowledge between theory and practice: What is nursing faculty using? *Teaching and Learning in Nursing, 13*, 174-179. doi: 10.1016/j.teln.2018.03.003

Curl, E. D., Smith, S. A., Chisholm, L. A., McGee, L., & Das, K. (2016). Effectiveness of integrated simulation and clinical experiences compared to traditional clinical experiences for nursing students. *Nursing Education Perspectives, 37*(2), 72-77. doi: 10.5480/15-1647

del Bueno, D. (2005). A crisis in critical thinking. *Nursing Education Perspectives, 26*(5), 278 – 283. doi: 10.1043/1536-5026

Doolen, J., Mariani, B., Atz, J., Horsely, T.L., O'Rourke, J., & McAfee, C.L. (2016). High-fidelity simulation in nursing education: A review of simulation reviews. *Clinical Simulation in Nursing, 12*, 290-302. doi: 10.1016/j.ecns.2016.01.009

Dreifuerst, K.T. (2012). Using debriefing for meaningful learning to foster the development of clinical reasoning in simulation. *Journal of Nursing Education, 51*(6), 326 – 333. doi: 10.3928/01484834-20120409-02

Experience [Def. 3]. (n.d.). Merriam-Webster Online. In Merriam-Webster. Retrieved October 20, 2018, from https://www.merriam-webster.com/dictionary/experience

Fanning, R.M., & Gaba, D.M. (2007). The role of debriefing in simulation-based learning. *Simulation in Healthcare, 2*(1), 115 – 125. doi:10.1097/SIH.0b.013e3180315539

Fedko, A. S., & Dreifuerst, K. T. (2017). Examining the relationship between clinical judgment and nursing actions in prelicensure students. *Nurse Educator, 42*(1), 47-50. doi: 10.1097/NNE.0000000000000290

Fenske, C.I., Harris, C.M., Aebersold, M.L., & Hartman. L.S. (2013). Perception versus reality: A comparative study of the clinical judgment skills of nurses during a simulated activity. *Journal of Continuing Education in Nursing, 44*(9), 399-405. doi: 10.3928/0022012420130701-67

Fey, M.K. (2016). Leading the way in simulation research. *Clinical Simulation in Nursing, 12,* 85-86. doi: 10.1016/j.ecns.2016.01.001

Field, A. (2013). *Discovering Statistics using IBM SPSS Statistics 4th edition.* Thousand Oaks, California: Sage Publishing.

Fisher, D., & King, L. (2013). An integrative literature review on preparing nursing students through simulation to recognize and respond to the deteriorating patient. *Journal of Advanced Nursing, 69*(11), 2375-2388. doi:10.1111/jan.12174

Forbes, H., Oprescu, F.I., Downer, T., Phillips, N.M., McTier, L., Lord, B., … Visser, I. (2016). Use of videos to support teaching and learning of clinical skills in nursing education: A review. *Nurse Education Today, 42,* 53-56. doi: 10.1016/j.nedt.2016.04.010

Forneris, S.G., Neal, D.O., Tiffany, J., Kuehn, M.B., Meyer, H.M., Blazovich, L.M., … Smerillo, M. (2015). Enhancing clinical reasoning through simulation debriefing: A multisite study. *Nursing Education Perspectives, 36*(5), 304-310. doi:10.5480/15-1672

Foronda, C., Godsall, L., & Trybulski, J. (2013). Virtual clinical simulation: The state of the science. *Clinical Simulation in Nursing, 9*(8), e279 – e286. doi: 10.1016/j.ecns.2012.05.005

Gantt, L.T. (2013). The effect of preparation on anxiety and performance in summative simulations. *Clinical Simulation in Nursing, 9*(1), e25 – e 33. doi: 10.1016/j.ecns.2011.07.004

Hanberg, A., Brown, S.C., Hoadley, T., Smith, S., & Courtney, B. (2007). Finding funding: The nurses' guide to simulation success. *Clinical Simulation in Nursing, 3*(1), E5-E9. doi: 10.1016/j.ecns.2009.05.032

Hayden, J. A., Keegan, M., Kardong-Edgren, S., & Smiley, R. (2014). Reliability and Validity Testing of the Creighton Competency Evaluation Instrument for Use in the NCSBN National Simulation Study. Nursing Education Perspective, 35(4), 244-252.

Holland, A., Smith, F., McCrossan, G., Adamson, E., Watt, S., & Penny, K. (2013). Online video in clinical skills education of oral medication administration for undergraduate student nurses: A mixed methods prospective cohort study. *Nurse Education Today, 33*(6), 663-670. doi: 10.1016/j.nedt.2012.01.006

Husebo, S.E., Friberg, F., Soreide, E., & Rystedt, H. (2012). Instructional Problems in Briefings: How to Prepare Nursing Students for Simulation-Based Cardiopulmonary Resuscitation Training. *Clinical Simulation in Nursing, 8*(7), e307 - e318. doi.org/10.1016/j.ecns.2010.12.002

International Nursing Association for Clinical Simulation and Learning. (2016). Standards of best practice: Glossary. Retrieved from http://www.nursingsimulation.org/article/S1876-1399(16)30133-5/fulltext

International Nursing Association for Clinical Simulation and Learning. (2016). Standards of best practice: Simulation design. Retrieved from https://www.inacsl.org/i4a/pages/index.cfm?pageID=3407

International Nursing Association for Clinical Simulation and Learning. (2018). Research Priorities. Retrieved from https://www.inacsl.org/i4a/pages/index.cfm?pageID=3293

Johnson, E.A., Lasater, K., Hodson-Carlton, K., Siktberg, L., Sideras, S., & Dillard, N. (2012). Geriatrics in simulation: Role modeling and clinical judgment effect. *Nursing Education Perspectives, 33*(3), 176-180.

Jones, B., & Potter, C. (2017). Applying best practice in simulation: Critical care response team training. *Clinical Simulation in Nursing, 13*, 442-445. doi: 10.1016/j.ecns.2017.05.009

Kardong-Edgren, S., & Fey, M.A. (2017). State of research on simulation in nursing program. *Journal of Professional Nursing, 33,* 397- 398. doi: 10.1016/j.profnurs.2017.10.009

Kelly, M., Lyng, C., McGrath, M., & Cannon, G. (2009). A multi-method study to determine the effectiveness of and student attitudes to online instructional videos for teaching clinical nursing skills. *Nurse Educator Today, 29*(3), 292-300. doi: 10.1016/j.nedt.2008.09.004

Kim, Y.J., Noh, G.O., & Im, Y.S. (2017). Effect of step-based prebriefing activities on flow and clinical competency of nursing students in simulation-based education. *Clinical Simulation in Nursing, 13*(11), 544-551. doi: 10.1016/j.ecns.2017.06.005

Knowledge [Def. 1]. (n.d.). Merriam-Webster Online. In Merriam-Webster. Retrieved October 20, 2018, from https://www.merriam-webster.com/dictionary/knowledge

Lapkin, S., Levett-Jones, T., Bellchanbers, H., & Fernandez, R. (2010). Effectiveness of patient simulation manikins in teaching clinical reasoning skills to undergraduate nursing students: A systematic review. *Clinical Simulation in Nursing, 6*(6), e207-e222. doi: 10, 1016/j.ens.2010.05.005

Lasater, K. (2011). Clinical judgment: The last frontier for evaluation. *Nurse Education in Practice, 11*, 86-92. doi: 10.1016/j.nepr.2010.11.013

Lasater, K., Nielsen, A., Stock, M., & Ostrogorsky, Y. (2015). Evaluating clinical judgment of newly hired staff nurses. *Journal of Continuing Education in Nursing, 46*(12), 569-571.

Lavoie, P., Cossette, S., & Pepin, J. (2016). Testing nursing students' clinical judgment in a patient deterioration simulation scenario: Development of a situation awareness instrument. *Nurse Education Today, 38,* 61-67. doi: 10/1016/j.nedt.2015.12.015

Lawrence, K., Hilfinger-Messias, D.K., & Cason, M.L. (2018). The influence of simulation experiences on new nurses' clinical judgment. *Clinical Simulation in Nursing, 25,* 22-27. doi: 10.1016./j.ecns.2018.10.008

Leigh, G., & Steuben, F. (2018). Setting learners up for success: Presimulation and prebriefing strategies. *Teaching and Learning in Nursing, 13,* 185 – 189. doi: 10.1016/j.teln.2018.03.004

Leighton, K. (2009). Death of a simulator. *Clinical Simulation in Nursing, 5,* e59 – e62. doi: 10.1016/j.jecns.2009.01.001

Leighton, K., Ravert, P., Mudra, V., & MacIntosh, C. (2015). Updating the simulation effectiveness tool: Item modification and reevaluation of psychometric properties. *Nursing Education Perspectives, 36*(5), 317-323. doi: 10.5480/15-1671

Lindsey, P.L., & Jenkins, S. (2013). Nursing students' clinical judgment regarding rapid response: The influence of a clinical simulation education intervention. *Nursing Forum, 48*(1), 61 – 70. doi: 10.1111/nuf.12002

Maloney, S., & Haines, T. (2016). Issues of cost-benefit and cost-effectiveness for simulation in health profession education. *Advances in Simulation, 1*(1), 13. doi: 10.1186/s41077-016-0020-3

Mariani, B., & Doolen, J. (2016). Nursing simulation research: What are the perceived gaps? *Clinical Simulation in Nursing, 12*(1), 30 – 36. doi: 10.1016/j.encs.2015.11.004

McDermott, D.S. (2016). The prebriefing concept: A Delphi study of CHSE experts. *Clinical Simulation in Nursing, 12*(6), 219 – 227. doi: 10.1016/j.ecns.2016.02.001

Miraglia, R., & Asselin, M.E. (2015). The Lasater clinical judgment rubric as a framework to enhance clinical judgment in novice and experienced nurses. *Journal for Nurses in Professional Development, 31*(5), 284-291. doi: 10.1097/nnd.0000000000000209

National League of Nursing. (2015). A vision for the changing faculty role: Preparing students for the technological world of healthcare. Retrieved from www.nln.org/docs/default-source/about/nln-vision-series-(position-statements)/a-vision-for-the-changing-faculty-role-preparing-students-for-the-technological-world-of-health-care.pdf?sfvrsn=0

National League for Nursing. (2015). A vision for teaching simulation. Retrieved from http://www.nln.org/docs/default-source/about/nln-vision-series-(position-statements)/vision-statement-a-vision-for-teaching-with-simulation.pdf?sfvrsn=2

National League of Nursing. (2019). The biennial survey of school of nursing academic year 2017-2018: Executive summary. Retrieved from www.nln.org/docs/default-source/default-document-library/executive-summary-(pdf)86d9c95c78366c709642ff00005f0421.pdf?sfvrsn=0

National League of Nursing. (2019). The biennial survey of nursing academic year 2017 – 2018. Retrieved from http://www.nln.org/newsroom/nursing-education-statistics/biennial-survey-of-schools-of-nursing-academic-year-2017-2018

Neill, M.A., & Wotton, K. (2011). High - fidelity simulation debriefing in nursing education: A literature review. *Clinical Simulation in Nursing, 7*(5), e161 – e168. doi: 10.1016/j.ecns.2011.02.001

Organization for Associate Degree Nursing. (2018). Mission statement. Retrieved from https://www.oadn.org/about-us/about-oadn

Page – Cutrara, K. (2014). Use of prebriefing in nursing simulation: A literature review. *Journal of Nursing Education, 53*(3), 136 – 141. doi: 10.3928/01484834-20140211-07

Page – Cutrara, K. (2015). Prebriefing in nursing simulation: A concept analysis. *Clinical Simulation in Nursing, 11*(7), 335-340. doi: 10.1016/j.ecns.2015.05.001

Page – Cutrara, K., & Turk, M. (2017) Impact of prebriefing on competency performance, clinical judgment, and experience in simulation: An experimental study. *Nurse Educator Today, 48,* 78 – 83. doi: 10.1016/j.nedt.2016.09.012

Portney, L.G., & Watkins, M.P. (2015). *Foundation of Clinical Research: Application to Practice* (3rd Eds). Philadelphia: Pennsylvania: F.A. Davis.

Roh, Y.S., Aha. J-W., Kim, E., & Kim, J. (2018). Effects of prebriefing on psychological safety and learning outcomes. *Clinical Simulation in Nursing, 25*, 12-19. doi.org/10.1016/j.ecns.2018.10.001

Rudolph, J. W., Raemer, D. B., & Simon, R. (2014). Establishing a safe container for learning in simulation. The role of the Presimulation briefing. *Simulation in Healthcare: Journal of the Society for Simulation in Healthcare, 9*(6), 339–349. doi: 10.1097/SIH.0000000000000047

Salkind, N.J. (2014). *Statistics for people who (think they) hate statistics.* Thousand Oaks, California: Sage Publications.

Schon, D.A. (1983). *Educating the Reflective Practitioner.* San Francisco, California: Jossey – Bass.

Sharoff, L. (2015). Simulation: Pre-briefing, clinical judgment and reflection. What is the connection? *Journal of Contemporary Medicine, 5*(2), 88 – 101. doi: 10.16899/ctd.49922

Shatto, B. (2016). Moving on from Millennials: Preparing for generation Z. *The Journal of Continuing Education in Nursing, 47*(6), 253 – 254. doi: 10.3928/00220124-20160518-05

Shatto, B., & Erwin, K. (2017). Teaching millennials and generation Z: Bridging the generational divide. *Creative Nursing, 23*(1), 24 – 28. doi: 10.1891/1078-4535.23.1.24

Smiley, R.A. (2019). Survey of simulation use in prelicensure nursing programs: Changes and advancements, 2010 – 2017. *Journal of Nursing Regulation, 9*(4), 48-61. doi: 10.1016/S2155-8256(19)30016-X

Smiley, R.A., Lauer, P., Bienemy, C., Berg, J.G., Shireman, E., Reneau, K.A., & Alexander, M. (2019). The 2017 national nursing workforce survey. *Journal of Nursing Regulation, Supplement, 9*(3), S1-S15.

Stuedemann - Fedko, A., & Thomas Dreifuerst, K. (2017). Examining the Relationship Between Clinical Judgment and Nursing Actions in Prelicensure Students. *Nurse Educator, 42*(1), 47-5. doi: 10.1097/NNE.0000000000000290

Sulaiman, D. A. S., & Lasater, K. (2016). Simulation debriefing for clinical judgment development: A concept analysis. *Nurse Education Today, 45*, 42-47. doi: 10.1016/j.nedt.2016.06.008

Tanner, C.A. (2006). Thinking like a nurse: A research-based model of clinical judgment in nursing. *The Journal of Nursing Education, 45*(6), 204 – 211.

Theisen, J.L., & Sandau, K.E. (2013). Competency of new graduate nurses: A review of their weaknesses and strategies for success. *The Journal of Continuing Education in Nursing, 44,* 406-414. doi: 10.3928/00220124-20130617-38

Todd, M., Manz, J., Hawkins, K., Parsons, M., & Hercinger, M. (2008). The development of a quantitative evaluation tool for simulations in nursing education. *International Journal of Nursing Education Scholarship*, 5, Article 41. 10.2202/1548-923X.1705

Tyerman, J., Luctkar-Flude, M., Graham, L., Coffey, S., & Olsen-Lynch, E. (2019). A systematic review of health care pre-simulation preparation and briefing effectiveness. *Clinical Simulation in Nursing, 27*, 12-25. doi.org/10.1016/j.ecns.2018.11.002

Tyerman, J., Luctkar-Flude, M., Graham, L., Coffey, S., & Olsen-Lynch, E. (2016). Pre-simulation preparation and briefing practices for healthcare professionals and students: A systematic review protocol. *JBI Database of Systematic Reviews and Implementation Reports, 14*(8), 80-9. doi: 10.11124/JBISRIR-2016-003055

Victor, J. (2017). Improving clinical judgment in prelicensure students. *Journal of Nursing Education, 56*(12), 733-736. doi: 10.3928/01484834-20171120-05

Chapter Five

Simulation-based learning has become an essential teaching strategy in nursing education. Simulation provides opportunities for students to transfer theoretical knowledge into clinical practice, develop practical skills, and foster clinical reasoning and judgment in a safe environment. Nursing educators are increasingly using simulation to teach clinical skills due to the decreasing availability of traditional clinical spaces and faculty shortages. As a result, research into simulation has grown exponentially in the past decade. Nursing educators and researchers are exploring how to best use and practice simulation to improve students' readiness for real-world practice.

Debriefing methodologies are being explored to determine best practices for developing students' clinical reasoning and judgment. This program of research began with a review of how structured debriefing sessions impact students' clinical reasoning. Debriefing is the last phase of the simulation and is a reflective process where students appraise their actions in the simulation scenario (INACSL, 2016; Sulaiman & Lasater, 2016). The first manuscript's findings supported the use of a structured debriefing session to facilitate the transfer of knowledge and foster students' clinical reasoning (Dreifuerst, 2012; Forneris et al., 2015; Mariana et al., 2013: Shinnick et al., 2011). However, the limited number of studies and the use of small sample sizes on two studies hinders the generalizability of the results. Therefore, additional studies are needed to research best practices for debriefing. In addition, studies with large sample sizes and with students at different levels of nursing are needed to further evaluate structured debriefing's impact on students' clinical reasoning abilities.

As nursing education increasingly uses simulation-based activities to teach clinical skills, programs are challenged to create highly functional and realistic simulation labs. However, the use of this technology comes with a price. It is estimated that the cost for a basic simulation lab begins at $100,00 and can run into millions of dollars for realistic hospital-like labs with multiple high fidelity simulators (Hanberg et al., 2007: Maloney & Haines, 2016). The second manuscript is a grant application. The Texas Higher Education Coordinating Board directs the Nursing Innovation grant program, which provides funds for building simulation and skills labs. In November 2016, Texarkana College was awarded one of these grants.

The nursing program used these funds to purchase lab equipment that included three moderate fidelity simulators with accessory packages, and task trainers. The funds were also used to support faculty education and add realism to the labs, such as headwalls and rolling equipment carts. By the end of the grant, the associate degree program had increased the number of simulation hours from 96 to 173. Although the impact of simulation-based activities is difficult to quantify, faculty feedback indicated that simulation supported students' learning, as evidenced by higher standardized assessment scores. A critical review by Jumah and Ruland (2015), also reported an improvement in students' performance and satisfaction scores when simulation was used as a teaching strategy. A study by Curl et al. (2016) compared the exit exam scores of graduates who participated in simulation and traditional clinical experiences to students who only participated in traditional clinical opportunities. The exit scores for the students who participated in both the simulation and traditional clinical were higher, which also supports the use of simulation as an effective teaching strategy. However, additional

studies are needed to determine best practices for substituting simulation with clinical learning and developing valid and reliable instruments for evaluating students' simulation-based learning.

Simulation is comprised of three phases: prebriefing, an interactive scenario, and debriefing. Prebriefing is comprised of exercises that prepare the learner for the simulation scenario (Chamberlain, 2015; INACSL, 2016; Leigh & Steuben, 2018; Page-Cutrara, 2014; Tyerman et al., 2019; Victor, 2017). According to INACSL (2018) and nursing researchers, prebriefing is understudied. However, emerging literature is beginning to demonstrate the importance of prebriefing exercises and their contributions to students' readiness for simulation (Chamberlain, 2017; Husebo et al., 2012; Leigh & Steuben, 2018; McDermott, 2016; Kim, Noh & Im, 2017; Page-Cutrara & Turk, 2017; Sharoff, 2015).

The last manuscript explored the impact of a structured online prebriefing exercise on prelicensure students' clinical judgment. The study used a quasi-experimental approach to compare the impact of online prebriefing exercises to traditional face to face instructions on students' clinical judgment. The participants were evaluated using the Creighton Competency Evaluation Instrument. The students who received the online prebriefing exercises scored higher than the control group, but the results were not statistically significant. The study also noted that the students perceived the online prebriefing exercises to be beneficial to their learning and contributed to their confidence. The findings show that online prebriefing activities that provide students with clear expectations, background information, and an orientation to the lab and equipment contributed to students' clinical judgment. This result supports previous

nursing research regarding prebriefing and clinical judgment (Chamberlain, 2017; Kim, Noh & Im, 2017; Page-Cutrara & Turk, 2017; Sharoff, 2015).

However, the relationship between simulation and students' clinical judgment is complicated. Additional research is needed to examine and better understand this relationship. Although prebriefing provides educators with another opportunity to foster prelicensure students' clinical judgment, research that explores best practices for promoting clinical judgments during simulation is needed. Studies with larger samples and students at different stages of the prelicensure programs will also help to further nursing understanding of prebriefing. Future studies that examine the amount of time spent on prebriefing and the types of assignments that best support students' readiness for simulation should also be conducted.

This research study paired an online learning platform with simulation activities. The study's participants reported that the use of the online exercises contributed to their readiness for simulation and decreased their anxiety. Today's students are avid consumers of technology, and using teaching activities that connect with this generation of learners will assist educators in developing their clinical skills. However, additional research is needed to explore how educators are using technology to support student learning. Future studies to explore how virtual simulation is influencing student learning and what online assignments best contribute to readiness for practice need to be undertaken.

In conclusion, the scientific evidence provided in this dissertation portfolio demonstrates the importance of structured prebriefing and debriefing activities in developing students' clinical reasoning and judgment. Prelicensure nursing students lack

experiential knowledge to make informed clinical decisions. Simulation exercises are providing nursing educators with a vehicle to assist students in transferring knowledge into practice, developing practical skills, and fostering clinical judgment. Although the manuscripts in this portfolio indicated that structured prebriefing and debriefing activities foster students' clinical judgment skills, more research in these two critical areas of simulation is needed.

References

Aebersold, M., & Tschannen, D. (2013). Simulation in nursing practice: The impact on patient care. *The Online Journal of Issues in Nursing, 18* (2). doi 10.312/OJIN.Vol18No02Man06

American Association of College of Nursing. (2018). The essentials of baccalaureate nursing for profession nursing practice. Retrieved from http://www.aacnnursing.org/Portals/42/Publications/BaccEssentials08.pdf

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

Chamberlain, J. (2015). Prebriefing in nursing simulation. A concept analysis using Rodger's methodology. *Clinical Simulation in Nursing, 11*(7), 318-322. doi: 10.1016/j.ecns.2015.05.003

Chamberlain, J. (2017) The impact of simulation prebriefing on perceptions of overall effectiveness, learning, and self-confidence in nursing students. *Nursing Education Perspectives, 38*(3), 119 – 125. doi: 10.1097/01.NEP.0000000000000135

Cooper, S., Cant, R., Porter, J., Sellick, K., Somers, G., Kinsman, L., & Nestel, D. (2010). Rating medical emergency teamwork performance: Development of the team emergency assessment measure (TEAM). *Resuscitation, 81*(4), 446 – 452. doi: 2048/10.1016/j.resuscitation.2009.11.027

Curl, E. D., Smith, S. A., Chisholm, L. A., McGee, L., & Das, K. (2016). Effectiveness of integrated simulation and clinical experiences compared to traditional clinical experiences for nursing students. *Nursing Education Perspectives, 37*(2), 72-77. doi: 10.5480/15-1647

del Bueno, D. (2005). A crisis in critical thinking. *Nursing Education Perspectives, 26*(5), 278 – 283. doi: 10.1043/1536-5026

Dreifuerst, K.T. (2012). Using debriefing for meaningful learning to foster the development of clinical reasoning in simulation. *Journal of Nursing Education, 51*(6), 326 – 333. doi: 10.3928/01484834-20120409-02

Fanning, R.M., & Gaba, D.M. (2007). The role of debriefing in simulation-based learning. *Simulation in Healthcare, 2*(1), 115 – 125. doi:10.1097/SIH.0b.013e3180315539

Forneris, S.G., Neal, D.O., Tiffany, J., Kuehn, M.B., Meyer, H.M., Blazovich, L.M., … Smerillo, M. (2015). Enhancing clinical reasoning through simulation debriefing: A multisite study. *Nursing Education Perspectives, 36*(5), 304-310. doi:10.5480/15-1672

Hanberg, A., Brown, S.C., Hoadley, T., Smith, S., & Courtney, B (2007). Finding funding: The nurses' guide to simulation success. *Clinical Simulation in Nursing Education, 3,* e5-39. doi: 10.1016/j.ecns.2009.05.032

Hart, P.L., Brannan, J.D., Long, J.M., Maguire, M.R., Brooks, R.K., & Robley, L.R. (2014). Effectiveness of a structured curriculum focused on recognition and response to acute patient deterioration in an undergraduate BSN program. *Nurse Education in Practice, 14*(1), 30 – 36. doi: 10.1016/j.nepr.2013.06.010

Husebo, S.E., Friberg, F., Soreide, E., & Rystedt, H. (2012). Instructional problems in briefings: How to prepare nursing students for simulation-based cardiopulmonary resuscitation training. *Clinical Simulation in Nursing, 8*(7), e307 - e318. doi.org/10.1016/j.ecns.2010.12.002

International Nursing Association for Clinical Simulation and Learning. (2016). Standards of best practice: Simulation design. Retrieved from https://www.inacsl.org/i4a/pages/index.cfm?pageID=3407

International Nursing Association for Clinical Simulation and Learning. (2018). Research priorities. Retrieved from https://www.inacsl.org/i4a/pages/index.cfm?pageID=3293

Jenson, R. (2013). Clinical reasoning during simulation: Comparison of student and faculty ratings. *Nursing Education in Practice, 13*(1), 23 - 28. doi: 10.1016/j.nepr.2012.07.001

Jumah, J. A., & Ruland, J. (2015). A critical review of simulation based on nursing education research: 2004-2011. *International Journal of Nursing Education, 7*(3), doi: 10.5958/0974-9357.2015.00151.8

Kim, Y.J., Noh, G.O., & Im, Y.S. (2017). Effect of step-based prebriefing activities on flow and clinical competency of nursing students in simulation-based education. *Clinical Simulation in Nursing, 13*(11), 544-551. doi: 10.1016/j.ecns.2017.06.005

Kardong-Edgren, S., & Fey, M.A. (2017). State of research on simulation in nursing program. *Journal of Professional Nursing, 33*, 397- 398. doi: 10.1016/j.profnurs.2017.10.009

Lapkin, S., Levett-Jones, T., Bellchanbers, H., & Fernandez, R. (2010). Effectiveness of patient simulation manikins in teaching clinical reasoning skills to undergraduate nursing students: A systematic review. *Clinical Simulation in Nursing, 6*(6), e207-e222. doi: 10, 1016/j.ens.2010.05.005

Leigh, G., & Steuben, F. (2018). Setting learners up for success: Presimulation and prebriefing strategies. *Teaching and Learning in Nursing, 13,* 185 – 189. doi: 10.1016/j.teln.2018.03.004.

Mariani, B., & Doolen, J. (2016). Nursing simulation research: What are the perceived gaps? *Clinical Simulation in Nursing, 12*(1), 30 – 36. doi: 10.1016/j.encs.2015.11.004

Maloney, S., & Haines, T. (2016). Issues of cost-benefit and cost-effectiveness for simulation in health profession education. *Advances in Simulation, 1*(1), 13. doi: 10.1186/s41077-016-0020-3.

McDermott, D.S. (2016). The prebriefing concept: A Delphi study of CHSE experts. *Clinical Simulation in Nursing, 12*(6), 219 – 227. doi: 10.1016/j.ecns.2016.02.001.

National League for Nursing. (2015). A vision for teaching simulation. Retrieved from http://www.nln.org/docs/default-source/about/nln-vision-series-(position-statements)/vision-statement-a-vision-for-teaching-with-simulation.pdf?sfvrsn=2

Neill, M.A., & Wotton, K. (2011). High - fidelity simulation debriefing in nursing education: A literature review. *Clinical Simulation in Nursing, 7*(5), e161 – e168. doi: 10.1016/j.ecns.2011.02.001

Nickerson, M., & Pollard, M. (2010). Mrs. Chase and her descendants. A historical view of simulation. *Creative Nursing, 16*(3) 101-105. DOI:10.1891/1078-4535.16.3.101

Page – Cutrara, K. (2014). Use of prebriefing in nursing simulation: A literature review. *Journal of Nursing Education, 53*(3), 136 – 141. doi: 10.3928/01484834-20140211-07

Page – Cutrara, K., & Turk, M. (2017) Impact of prebriefing on competency performance, clinical judgment, and experience in simulation: An experimental study. *Nurse Educator Today, 48,* 78 – 83. doi: 10.1016/j.nedt.2016.09.012

Sanko, J. (2017). Simulation as a teaching technology: A brief history of its use in nursing education. *Quarterly Review of Distance Education, 18*(2), 77-103.

Sharoff, L. (2015). Simulation: Pre-briefing, clinical judgment, and reflection. What is the connection? *Journal of Contemporary Medicine, 5*(2), 88 – 101. doi: 10.16899/ctd.49922

Shinnick, M.A., & Woo, M.A. (2013). The effect of human patient simulation on critical thinking and its predictors in prelicensure nursing students. *Nurse Education Today, 33,* 1062-1067. doi: 10.1016/j.nedt.2012.04.004

Smiley, R.A. (2019). Survey of simulation use in prelicensure nursing programs: Changes and advancements, 2010 – 2017. *Journal of Nursing Regulation, 9*(4), 48-61. Doi: 10.1016/S2155-8256(19)30016-X

Sulaiman, D. A. S., & Lasater, K. (2016). Simulation debriefing for clinical judgment development: A concept analysis. *Nurse Education Today, 45,* 42-47. doi: 10.1016/j.nedt.2016.06.008

Tyerman, J., Luctkar-Flude, M., Graham, L., Coffey, S., & Olsen-Lynch, E. (2019). A systematic review of health care pre-simulation preparation and briefing effectiveness. *Clinical Simulation in Nursing, 27*, 12-25. doi.org/10.1016/j.ecns.2018.11.002

Appendix A

Ref: NURSINGSIMULATION_2017_297
Title: Fostering Clinical Reasoning through Structured Debriefing Exercises
Journal: Clinical Simulation in Nursing

Dear Ms. Delavan,

Thank you for submitting your manuscript to Clinical Simulation in Nursing. I regret to inform you that reviewers have advised against publishing your manuscript, and we must therefore reject it.

Please refer to the comments listed at the end of this letter for details of why I reached this decision.

We appreciate your submitting your manuscript to this journal and for giving us the opportunity to consider your work.

Kind regards,

Dr. Nicole Harder
Editor-in-Chief
Clinical Simulation in Nursing

Comments from the editors and reviewers:
-**Editor**

- Thank you for your manuscript. While you have provided an overview of your identified areas, they are not strongly linked. As a review article, generally you need to provide a stronger rationale as to what gap your review fills in the literature, which is missing from your work. Go to the JBI website to see how reviews can be structured prior to actually conducting the review. There is no discussion section that links the reviews together, which would be helpful. As it is currently written, this may be better presented at a conference. Thank you for considering our journal for your work.

Appendix B

Grant Award Letter

60x30TX
Texas Higher Education Coordinating Board

THECB Award Number: 18027
Appropriation Year: **AY17 Sep 2016 - Aug 2017**

Notice of State Grant Award
to
Texarkana College

Grantee Name and Address:	Grant Title: **Nursing & Allied Health - Building Simulation & Skills Lab Capacity**
Texarkana College **2500 North Robison Road** **Texarkana, TX 75599**	Amount of Award: **$ 179,233**
	Division: **070 Academic Quality and Workforce**
	Term of Grant: **1/1/2017** to **12/31/2018** All funds must be expended by: **12/31/2018**
	Payment Method: **Reimbursement**

Authority: **Texas Education Code, Sections 63.202 (f) and (g)**

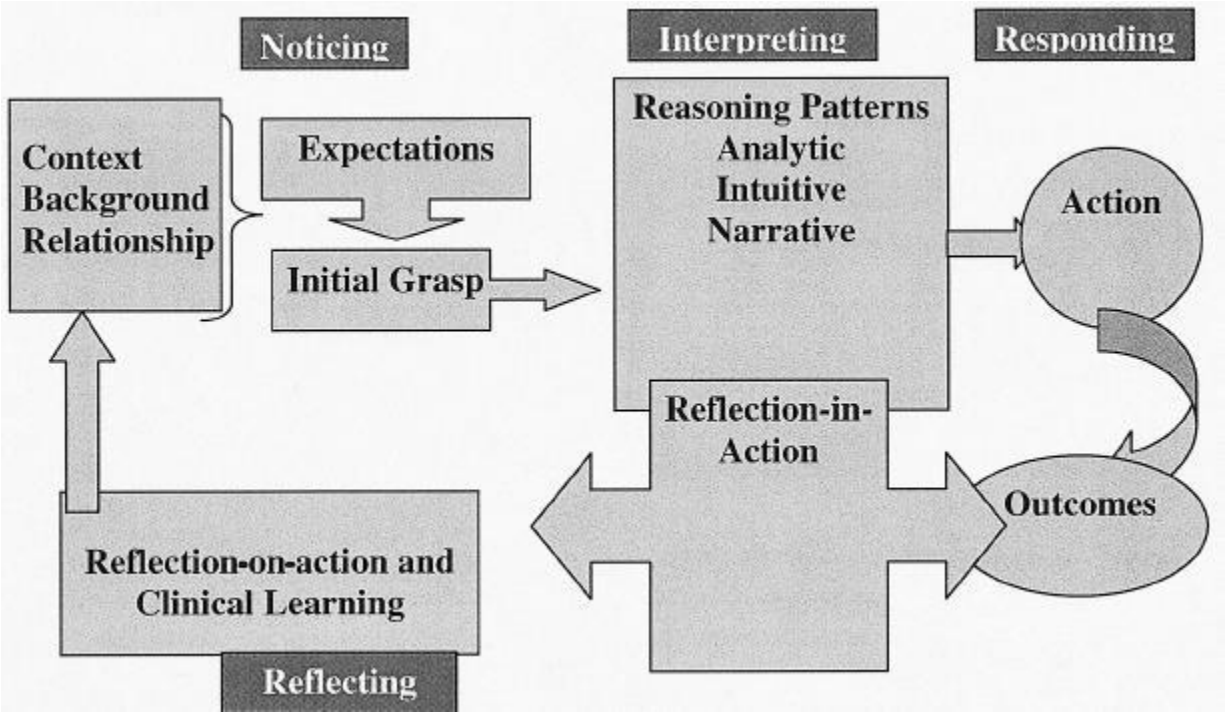
The Texas Higher Education Coordinating Board's ("THECB") and the Grantee's (collectively, referred to as "the parties") execution of this Notice of Grant Award creates a legally binding agreement between the parties. The Program requirements (e.g., objectives, scope, budget, methodology) as stated in (1) the original Request for Application ("RFA") including any addenda issued, (2) addenda to the Grantee's Application (if any), and (3) Grantee's Application are incorporated into and made a part of this Notice of Grant Award for all purposes, supersede any prior or contemporaneous understandings between the parties pertaining to the subject matter herein whether oral or written, and collectively constitute the entire agreement between the parties. In the event of a conflict in the language contained in the incorporated documents, conflicts shall be resolved by reference to the language contained in the documents in the order listed above.

Any changes in the approved Grant must follow THECB's amendment process as defined in the RFA. Any funds received by Grantee and not expended prior to the end of the grant term indicated above shall be returned to THECB within thirty (30) days unless otherwise agreed by THECB and Grantee.

Approving THECB Official:	**Approving Grantee Official:**
Rx C Peebles	
Rex C. Peebles **Assistant Commissioner** **Academic Quality and Workforce**	**James H. Russell** **President**
Date: 12/6/2016	**Date:** 12/5/16

Appendix C

Tanner's Model of Clinical Judgment



Appendix D

Creighton Competency Evaluation Instrument

Student Name: _____
Staff Nurse Instructor Name: _____

0= Does not demonstrate competency
1= Demonstrates competency
NA= Not applicable

Date: ____/____/____
MM / DD / YYYY

	Circle Appropriate Score for all Applicable Criteria - If not applicable, circle NA		
ASSESSMENT			
1. Obtains Pertinent Data	0	1	NA
2. Performs Follow-Up Assessments as Needed	0	1	NA
3. Assesses the Environment in an Orderly Manner	0	1	NA
COMMUNICATION			
4. Communicates Effectively with Intra/Interprofessional Team (TeamSTEPPS, SBAR, Written Read Back Order)	0	1	NA
5. Communicates Effectively with Patient and Significant Other (verbal, nonverbal, teaching)	0	1	NA
6. Documents Clearly, Concisely, & Accurately	0	1	NA
7. Responds to Abnormal Findings Appropriately	0	1	NA
8. Promotes Professionalism	0	1	NA
CLINICAL JUDGMENT			
9. Interprets Vital Signs (T, P, R, BP, Pain)	0	1	NA
10. Interprets Lab Results	0	1	NA
11. Interprets Subjective/Objective Data (recognizes relevant from irrelevant data)	0	1	NA
12. Prioritizes Appropriately	0	1	NA
13. Performs Evidence Based Interventions	0	1	NA
14. Provides Evidence Based Rationale for Interventions	0	1	NA
15. Evaluates Evidence Based Interventions and Outcomes	0	1	NA
16. Reflects on Clinical Experience	0	1	NA
17. Delegates Appropriately	0	1	NA
PATIENT SAFETY			
18. Uses Patient Identifiers	0	1	NA
19. Utilizes Standardized Practices and Precautions Including Hand Washing	0	1	NA
20. Administers Medications Safely	0	1	NA
21. Manages Technology and Equipment	0	1	NA
22. Performs Procedures Correctly	0	1	NA
23. Reflects on Potential Hazards and Errors	0	1	NA

COMMENTS:

COMMENTS

Total: _____
Total Applicable Items: _____
Earned Score _____

Revised for DEU use 8/20/2013

Appendix E

Permission to use Creighton Competency Evaluation Instrument

Name

First Name	Elizabeth
Last Name	Delavan
Credentials	MSN RN

Institutional affiliation

Institution Name	University of Texas - Tyler
Address	3900 University Blvd
City	Tyler
State (or country if outside the US)	TX
Zip Code/Postal Code	75799
Phone	903 244 - 3439

How do you plan to use the C-CEI©

- ☐ Research
- ☐ Student Competency
- ☐ Staff Competency
- ☐ Master's thesis
- ☐ DNP Project
- ☒ Ph D Dissertation

Agreement for use of the Creighton Competency Evaluation Instrument (C-CEI©)

I understand that I have been granted permission by the creators of the C-CEI© to use the C-CEI© for academic and/or research purposes.

I confirm that I will complete the required training prior to use of the C-CEI©. In addition, I agree that all individuals working with the C-CEI© will also complete the required training prior to using the instrument.

I agree that I will use the C-CEI© only for its intended use, and will not alter the C-CEI© in any way.

I understand that I may be asked to share results on any validity or reliability data as determined with the creators of the C-CEI©.

I AGREE

Appendix F

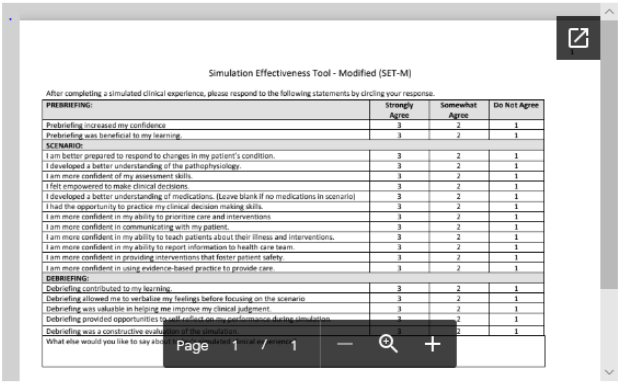
Simulation Effectiveness Tool Modified

After completing a simulated clinical experience, please respond to the following statements by circling your response.

PREBRIEFING:	Strongly Agree	Somewhat Agree	Do Not Agree
Prebriefing increased my confidence	3	2	1
Prebriefing was beneficial to my learning.	3	2	1
SCENARIO:			
I am better prepared to respond to changes in my patient's condition.	3	2	1
I developed a better understanding of the pathophysiology.	3	2	1
I am more confident of my nursing assessment skills.	3	2	1
I felt empowered to make clinical decisions.	3	2	1
I developed a better understanding of medications. (Leave blank if no medications in scenario)	3	2	1
I had the opportunity to practice my clinical decision making skills.	3	2	1
I am more confident in my ability to prioritize care and interventions	3	2	1
I am more confident in communicating with my patient.	3	2	1
I am more confident in my ability to teach patients about their illness and interventions.	3	2	1
I am more confident in my ability to report information to health care team.	3	2	1
I am more confident in providing interventions that foster patient safety.	3	2	1
I am more confident in using evidence-based practice to provide nursing care.	3	2	1
DEBRIEFING:			
Debriefing contributed to my learning.	3	2	1
Debriefing allowed me to verbalize my feelings before focusing on the scenario	3	2	1
Debriefing was valuable in helping me improve my clinical judgment.	3	2	1
Debriefing provided opportunities to self-reflect on my performance during simulation.	3	2	1
Debriefing was a constructive evaluation of the simulation.	3	2	1
What else would you like to say about today's simulated clinical experience?			

Leighton, K., Ravert, P., Mudra, V., & Macintosh, C. (2015). Update the Simulation Effectiveness Tool: Item modifications and reevaluation of psychometric properties. *Nursing Education Perspectives, 36*(5), 317-323. Doi: 10.5480/1 5-1671.

Permission to Use Simulation Effectiveness Tool-Modified



The SET-M below shows Subscale each item belongs to:

Download the Simulation Effectiveness Tool - Modified here. I
you need an official 'Permission to Use' letter, contact Dr. Kim
Leighton. Include the purpose of the official request (research,
grant), the intended use of the tool and with what population.
General use is already permitted per the statement on the
request form:

I understand that I have been granted permission by the creators of the requested evaluation instrument to use it for academic and/or research purposes.

I agree that I will use the evaluation instrument only for its intended use, and will not alter it in any way.

I will share findings as well as publication references with the instrument creator(s)

I am allowed to place the evaluation instrument into electronic format for data collection.

Appendix G

Institutional Review Board Permission University of Texas-Tyler

The University of Texas at TYLER
Office of Research and Scholarship

INSTITUTIONAL REVIEW BOARD

uttyler.edu/research • Fax: 903-565-5858

December 18, 2018

Dear Ms. Delavan,

Your request to conduct the study, *Effectiveness of a Structure Online Prebriefing Activity on Prelicensure Student's Clinical Judgment*, IRB #Sum 2018-55 has been approved by The University of Texas at Tyler Institutional Review Board under expedited review. This approval includes the written informed consents that are attached to this letter, and your assurance of participant knowledge of the following prior to study participation: this is a research study; participation is completely voluntary with no obligations to continue participating, and with no adverse consequences for non-participation; and assurance of confidentiality of their data.

In addition, please ensure that any research assistants are knowledgeable about research ethics and confidentiality, and any co-investigators have completed human protection training within the past three years, and have forwarded their certificates to the IRB office (G. Duke).

Please review the UT Tyler IRB Principal Investigator Responsibilities, and acknowledge your understanding of these responsibilities and the following through return of this email to the IRB Chair within one week after receipt of this approval letter:

- This approval is for one year, as of the date of the approval letter
- **The Progress Report form must be completed for projects extending past one year.** Your protocol will automatically expire on the one year anniversary of this letter if a Progress Report is not submitted, per HHS Regulations **prior** to that date (45 CFR 46.108(b) and 109(e): http://www.hhs.gov/ohrp/policy/contrev0107.html
- Prompt reporting to the UT Tyler IRB of any proposed changes to this research activity
- **Prompt reporting to the UT Tyler IRB and academic department administration will be done of any unanticipated problems involving risks to subjects or others**
- Suspension or termination of approval may be done if there is evidence of any serious or continuing noncompliance with Federal Regulations or any aberrations in original proposal.
- Any change in proposal procedures must be promptly reported to the IRB prior to implementing any changes except when necessary to eliminate apparent immediate hazards to the subject.
- Approval with signed consent

Best of luck in your research, and do not hesitate to contact me if you need any further assistance.

Sincerely,

Gloria Duke, PhD, RN

Gloria Duke, PhD, RN
Chair, UT Tyler IRB

Appendix H

Institutional Review Board Permission – Texarkana College

Boyles, John Dixon
Thu 1/31/2019 8:33 AM
Delavan, Elizabeth M.; McDaniel, Donna C.; Deese, Phyllis A.; Crane, Kenneth W.; Howard, Catherine E.

Hello Elizabeth,

Your research proposal has been reviewed and approved by the Texarkana College Institutional Review Board. We were all impressed by the design of your study and wish you success as you complete your dissertation.

Thank you.

Dixon Boyles, Ed.D
Dean of Business & Social Sciences
Texarkana College
2500 N. Robison Rd.
Texarkana, TX 75599
903-823-3192

Appendix I

Informed Consent

THE UNIVERSITY OF TEXAS AT TYLER

Informed Consent to Participate in Research
Institutional Review Board # SUM 2018-55
Approval Date: December 18th, 2018

1. **Project Title:** Effectiveness of a Structured Online Prebriefing Activity on Prelicensure

   Students' Clinical Judgment

2. **Principal Investigator:** Elizabeth Delavan MSN RN

3. **Participant Name:**

4. **Simple Description of Project Purpose:** Caring for patients is not easy. Registered nurses are making tough decisions about how to care for their patients every day. Nursing instructors are developing new activities to help students learn to care for patients in the hospital. This can include simulation activities where students act like nurses in the hospital. Prebriefing is the first stage of simulation. It can include videos, online questions, and a patient report. Prebriefing can help students to prepare for simulation. For this project, one group of students will receive online prebriefing exercises. This will include a video orientation to the simulation lab, report on the patient, time to review the patient's online chart and time to develop a plan of care. A second group of students will receive normal face to face prebriefing activities. This will include orientation to the simulation lab and equipment, a patient report from an instructor, and time to develop a plan of care. The researcher will then compare the two groups. The researcher is trying to determine which prebriefing is activity is better at helping nursing students learn clinical judgment skills.

5. **Research Procedures: <u>If you agree to be in this study, we will ask you to do the following things:</u>**

   a. Participate in online or traditional prebriefing exercises and provide feedback about these activities

b. Participate in an active simulation scenario and allow the research team to score the simulation scenarios

c. Complete two (2) quizzes and allow the research team to review the scores

6. **Potential Risks:** There are very few risks with this project. The scores from the two (2) quizzes will not count towards your course grades. Texarkana College does not grade your simulation performance. Also, your survey answers will remain with the research team until the research project is complete.

7. **Potential Benefits:** There are no direct benefits to this study. This study will help nursing researchers to improve simulation education for future nurses. The study will also add to nursing's knowledge of simulation with associate degree nursing students

Understanding of Participants:

8. I have been given a chance to ask any questions about this research study. The researcher has answered my questions. I understand any and all possible risks.

9. If I sign this consent form, I know, it means that:

- I am taking part in this study because I want to. I chose to take part in this study after having been told about the study and how it will affect me.

- I know that I am free to not be in this study. If I choose to not take part in the study, then nothing will happen to me as a result of my choice.

- I know that I have been told that if I choose to be in the study, then I can stop at any time. I know that if I do stop being a part of the study, then nothing will happen to me.

10. I have been promised that that my name or other identifying information will not be in any reports (presentations, publications) about this study unless I give my permission. The UT Tyler Institutional Review Board (the group that makes sure that research is done correctly and that procedures are in place to protect the safety of research participants) may look at the research documents. This is a part of their monitoring procedure and will be kept confidential.

11. If I have any questions concerning my participation in this project, I will contact the principal researcher:

12. If I have any questions concerning my rights as a research subject, I will contact Dr. Gloria Duke, Chair of the IRB, at (903) 566-7023, gduke@uttyler.edu.

CONSENT/PERMISSION FOR PARTICIPATION IN THIS RESEARCH STUDY

I have read and understood what has been explained to me. I give my permission to take part in this study as it is explained to me. I give the study researcher permission to register me in this study. I have received a signed copy of this consent form.

_____ _____

Signature of Participant Date

_____

Witness to Signature

13. I have discussed this project with the participant, using language that is understandable and appropriate. I believe that I have fully informed this participant of the nature of this study and its possible benefits and risks. I believe the participant understood this explanation.

_____ _____

Researcher/Principal Investigator Date

Appendix J

Photography/Video Release Form for Research Purposes

PHOTOGRAPHY/VIDEO RELEASE FORM FOR RESEARCH PURPOSES

IRB# Sum 2018-55 Approval Date: December 18th, 2018
Principal Investigator: Elizabeth Delavan MSN RN
Research Project: The Effectiveness of a Structured Online Prebriefing Activity on Prelicensure Student's Clinical Judgment

I hereby consent to and authorize the use by Elizabeth Delavan as a representative of **The University of Texas at Tyler**, or anyone authorized by you, of any and all photography/video/voice which you have taken of myself, for use by **The University of Texas at Tyler** for the purpose of the research project identified above.

I understand that it is my choice regarding the distribution of any videos, photos, and/or voice recordings that will be used for presentations, publications, or any other dissemination. All media shall constitute your property, solely and completely.

_____ (Participant initials) I give my permission to distribute any videos, photos or voice recordings for presentations, publications, educational purposes, or through any other venue as long as my name is not used.

Name: _____
Subject (Please Print)

Signature: _____
Subject or Parent if subject is a minor

Date: _____

Witness: _____

Appendix K

Creighton Competency Evaluation Instrument Training Certificates

Name

First Name	Elizabeth
Last Name	Delavan
Credentials	MSN RN

Institutional affiliation

Institution Name	University of Texas - Tyler
Address	12 Pecan Valley Circle
City	Nash
State (or country if outside the US)	TX
Zip Code/Postal Code	75569
Phone	

How do you plan to use the C-CEI©

- ☐ Research
- ☐ Student Competency
- ☐ Staff Competency
- ☐ Master's thesis
- ☐ DNP Project
- ☑ Ph D Dissertation

Agreement for use of the Creighton Competency Evaluation Instrument (C-CEI©)

I understand that I have been granted permission by the creators of the C-CEI© to use the C-CEI© for academic and/or research purposes.

I confirm that I will complete the required training prior to use of the C-CEI©. In addition, I agree that all individuals working with the C-CEI© will also complete the required training prior to using the instrument.

I agree that I will use the C-CEI© only for its intended use, and will not alter the C-CEI© in any way.

I understand that I may be asked to share results on any validity or reliability data as determined with the creators of the C-CEI©.

I AGREE

Name

First Name	Shannon
Last Name	Duke
Credentials	MSN, RN

Institutional affiliation

Institution Name	Texarkana College
Address	2500 N. Robison Road
City	Texarkana
State (or country if outside the US)	Texas
Zip Code/Postal Code	75599
Phone	9038233456

How do you plan to use the C-CEI©

☐ Research

Agreement for use of the Creighton Competency Evaluation Instrument (C-CEI©)

I understand that I have been granted permission by the creators of the C-CEI© to use the C-CEI© for academic and/or research purposes.

I confirm that I will complete the required training prior to use of the C-CEI©. In addition, I agree that all individuals working with the C-CEI© will also complete the required training prior to using the instrument.

I agree that I will use the C-CEI© only for its intended use, and will not alter the C-CEI© in any way.

I understand that I may be asked to share results on any validity or reliability data as determined with the creators of the C-CEI©.

I AGREE

Name

First Name	Martha Joan
Last Name	Smith
Credentials	MSN, RN, CCRN

Institutional affiliation

Institution Name	Wadley Regional Medical Center
Address	1000 PINE STREET
City	TEXARKANA
State (or country if outside the US)	TX
Zip Code/Postal Code	75501
Phone	903-798-8031

How do you plan to use the C-CEI©

- ☐ Research
- ☐ Student Competency
- ☐ Staff Competency
- ☐ Master's thesis
- ☐ DNP Project
- ☑ Ph D Dissertation

Agreement for use of the Creighton Competency Evaluation Instrument (C-CEI©)

I understand that I have been granted permission by the creators of the C-CEI© to use the C-CEI© for academic and/or research purposes.

I confirm that I will complete the required training prior to use of the C-CEI©. In addition, I agree that all individuals working with the C-CEI© will also complete the required training prior to using the instrument.

I agree that I will use the C-CEI© only for its intended use, and will not alter the C-CEI© in any way.

I understand that I may be asked to share results on any validity or reliability data as determined with the creators of the C-CEI©.

I AGREE

Appendix L

Structured Debriefing Impacts Clinical Reasoning

Citation: author(s), date of publication & title	Purpose of Study	Conceptual Framework	Design/ Method	Sample/Setting	Major Variables Studied and Their Definitions	Measurement of Major Variables	Data Analysis	Study Findings	Appraisal of Worth to Practice Strength of the Evidence (i.e., level of evidence + quality [study strengths and weaknesses]) RECOMMENDATIONS
Dreifuerst 2012 Using debriefing for meaningful learning to foster development of clinical reasoning in simulation	To identify and measure the effect of the DML method on students clinical reasoning skill development and their perception of the quality of the debriefing experience	Schon's Reflective theory (1985) Tanner's Model of Clinical Judgment (2006)	Quasi – experimental pre – post test study Pretest with HRST then a HF sim followed by debriefing session 3 weeks later 2nd alternate HSRT test	238 pre-licensure students in 7 or 8 semester BSN program Midwest university All completed HF simulation 1 group debriefed with DML by researcher 1 group usual debriefing by clinical instructor	IV - DML method of debriefing – 6 components DV - Clinical reasoning	Health Sciences Reasoning Test (HSRT) – Kuder-Richardson -20 estimated at 0.81 (N=444) Debriefing Assessment for Simulation in healthcare -student version (DASH-SV) Cronbach's's's alpha 0.82 for this study Debriefing for Meaningful Learning supplement questionnaire (DMLSQ) – student feedback	HSRT pretest (N=240, *M* = 23.9, *SD* = 5.6) HSRT posttest Exper. gp (N= 122, *M* = 24.3, SD= 5.3) Control group (N =116, *M*= 23.9, *SD* = 5.3) Mann-Whitney-Wilcox (*U*=3973.5, *W*=10759.5, *Z*=-6.059, *p*<.001	Reveals significant change in scores pretest to posttest using DML method of debriefing Support development of students clinical reasoning skills	Result support DML method of debriefing as a methodology for fostering students clinical reasoning skills Theory based method of debriefing Sustainability of student's clinical reasoning skills cannot be determined – additional longitudinal studies needed HSRT test is not specific to nursing – items may not adequate to examine clinical reasoning of students in clinical problem based situations
Forneris, O'Neal, Tiffany, Kuehn, Meyer, Blazovich, Holland & Smerillo 2015	Multi site replication of Dreifuerst study 2012 To identify and measure the effect of the DML method on	Schon's Reflective theory (1985) Kolb's experiential learning (1984)	Quasi – experimental pre – post test study Pretest with	156 pre-licensure students in senior level BSN program 4 Midwest universities	IV - DML method of debriefing – 6 components DV - Clinical reasoning	Health Sciences Reasoning Test (HSRT) – Kuder-Richardson 20 ranges estimated from .77 to .84 Debriefing Assessment for	HSRT Pretest exper. (N=78,M =22.74, *SD*=3.6) Posttest Exper	Reveals significant change in scores pretest to posttest using DML method of debriefing Support development of students clinical reasoning skills	DML method of debriefing supports significant improvements in students' clinical reasoning scores Multi-site study increases the generalizability of the findings

Enhancing clinical reasoning through simulation debriefing: A multisite study	students clinical reasoning skill development and their perception of the quality of the debriefing experience	Tanner's Model of Clinical Judgment (2006)	HRST then a HF sim followed by debriefing session 3 weeks later 2nd alternate HSRT test	All completed HF simulation 1 group debriefed with DML by researchers 1 group usual debriefing by clinical instructor		Simulation in healthcare -student version (DASH-SV) Cronbach's's's alpha 0.82 for this study Debriefing for Meaningful Learning supplement questionnaire (DMLSQ) – student feedback	(N=78,*M*= 23.56, *SD*=3.9) Paired test test =*p*=.03		Limitation – total number of participants fell below number needed to achieve power in statistical analysis
Lasater 2007 Clinical judgment development: Using simulation to create an assessment rubric	Develop a rubric that describes levels of performance in clinical judgment and pilot the rubric in scoring student performances	Tanner's Clinical Judgment Model (2006)	Qualitative-quantitative-qualitative design for exploratory research	Qualitative observations N=53; Quantitative N=39 Junior in BSN program – adult Med-surg course Week 1-6, rubric developed by observing student in sim lab Week 4-5 – students scored using rubric Week 7-8 – focus group N=8	DV clinical judgment	Lasater Clinical judgment rubric	Rubric scoring Clinical judgment (N=26, *M*=22.98, *SD*=6.07) Descriptive and ANOVA performed on 5 variables – none statistically significant	Initial development of a tool for evaluating clinical judgment – 11 dimensions and 4 developmental level	Study noted that simulation activities helped to identify clinical reasoning and skills gaps in students that may have been difficult to find in clinical setting HF simulation provides students the opportunity to foster clinical judgment Rubric provides performance expectations for both students and faculty Rubric will need further testing to determine effectiveness in evaluating students clinical reasoning skill development
Mariani, Cantrell, Meakim, Prieto, Dreifuerst 2013 Structured debriefing and	To determine if there is a difference in clinical judgment as measured by the Laster Clinical Judgment	Tanner's Clinical Judgment Model (2006)	Mixed method quasi experimental design - for quantitative part	1st semester junior level BSN students at 2 Midwest universities Participated in 2 simulations – 1 at midterm-	IV – debriefing for meaningful learning (DML) method of debriefing DV- clinical reasoning	Lasater Clinical Judgment Rubric (LCJR) – interrater reliability= 0.87; internal consistency = 0.97	Sim 1 intervent: M=28.48; SD=5.65; Control M=28.97, SD=7.31 Sim2	Qualitative findings indicated that students perceived more benefit in overall learning from DML debriefing Difference in group mean for overall	Qualitative findings support the essential nature of structured debriefing and its value on student focused learning Limitations: Inadequate observed power for statistical analysis LCJR was scored by students' faculty member after 1st simulation and by

students' clinical judgment abilities in simulation	Rubric between student who received debriefing using DML and those that did not		of the study and focus groups for qualitative part	2nd at end of semester – 1 group debriefed using DML, 2nd group usual debriefing Focus group end of semester			Intervent M=29.36; SD=5.93; Control M=29.07, SD6.06	scale scores on LCJR not statistically significant	researchers after 2nd simulation, could have affected the outcome Study is limited homogeneity of sample, could have skewed results Variation in unstructured debriefing in control group
Shinnick, Woo, Horwich Steadman 2011 Debriefing: The most important component in simulation	To determine if HF simulation of a common adult clinical situation, Heart Failure (HF), improves HF knowledge of prelicensure students and where knowledge gains are made in simulation process	None noted in article	2 group repeated measures design All Pretest on HF Group 1 sim - posttest -debrief Group 2 posttest-sim – debrief Both group then take 2nd posttest	162 prelicensure nursing students from 3 nursing schools All students have taken advanced medical - surgical course	IV- where knowledge gains are made in simulation DV – knowledge of heart failure (HF)	All tests were 12 item knowledge tests on heart failure - 3 versions (pretest, posttest 1 and posttest 2) Content validation of HF done by three experts – each questionnaire had 100% agreement on the content	Pretest on HF no statistically significant scores between groups Experimental group posttest 1 decreased (M = -5.63, SD = 3.89 Posttest 2 (M = 6.75, SD = 4.32) No significant difference in groups posttest 2 scores	Results show that knowledge decreased after hands-on component of simulation and increased only after active simulation and debriefing session	Reasonable to suggest that the guided reflection that occurs during debriefing facilitates student learning Clear knowledge gains were demonstrated after debriefing component of simulation process Limitations: HF content lecture taught by different faculty at each of the participating schools Students may have had previous clinical experiences with HF patients – skew results Previous simulation experience by students – 1 cohort seemed more comfortable than other three

Appendix M: Biographical Sketch

NAME: Elizabeth M Delavan MSN RN

POSITION TITLE: Doctoral Candidate, The University of Texas – Tyler

EDUCATION/TRAINING

INSITUTION AND LOCATION	DEGREE	COMPLETION DATE	FIELD OF STUDY
Laurentian University, Sudbury Ontario, Canada	Bachelors of Science	1993	Nursing
Texas A & M University – Texarkana, Texarkana, Texas	Masters of Science	2010	Nursing

B. POSITIONS:

2012 – Present	Associate Professor, Texarkana College, Texarkana Texas
2008 – 2011	Clinical Instructor Associate Degree and Licensed Vocational Nursing programs, Texarkana College, Texarkana, Texas
2007 – 2012	Staff Nurse – Intensive Care Unit, Wadley Regional Medical Center, Texarkana, Texas
1997 – 2006	Staff Nurse – Intensive Care Unit, Wadley Regional Medical Center, Texarkana, Texas
1995 – 1996	Staff Nurse – Telemetry Unit, Wadley Regional Medical Center, Texarkana, Texas
1994 – 1995	Staff Nurse – Surgical Unit, Wadley Regional Medical Center, Texarkana, Texas

C. Professional Licensures:

1993 – Current	College of Nurses of Ontario, Ontario, Canada
1993 – Current	Board of Nurse Examiners for the State of Texas, Texas

D. Professional Memberships:

2018 – Current	Sigma Theta Tau International
2012 – Current	National League for Nurses

E. Grant Awards

2017 – 2018	Co – Project Director Nursing Innovation Grant: Building Lab and Simulation Capacity: Texas Higher Education Coordinating Board Awarded $179,000.00.
2017	Co- Project Director Jobs and Education for Texans Grant: Texas Workforce Commission. Awarded $304,000.00
2016 – 2017	Co – Project Director Nursing Innovation Grant: Building Lab and Simulation Capacity: Texas Higher Education Coordinating Board Awarded $140,000.00