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A Comparative Evaluation of the Learner Centered Grading Debriefing Method in Nursing Education

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A Comparative Evaluation of the
Learner Centered Grading Debriefing Method in Nursing Education

by

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A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
College of Nursing
University of South Florida

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DEDICATION

This work is dedicated to the two most amazing individuals I have been blessed by God to have in my life.

To my husband for your love, constant support and endless encouragement during the pursuit of this goal, I could never be at this point in my life without you. You are my best friend, my biggest cheerleader and my most ferocious protector.

To my mother, the most amazing woman I have ever known, whose strength of character has always inspired me. Throughout my life with my mother I have received constant support and encouragement to reach my highest potential. I have always strived to make her proud because I am so very proud to be her daughter.

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ABSTRACT

The nursing discipline lacks a consensus on a best practice method for debriefing students following simulation-based training. A recognized, standardized method does not exist and various methods are utilized within the domain. The similarities between aviation and healthcare are well documented. Training members of both disciplines require standardization and methods of best practice. The aviation industry through the Federal Aviation Administration has found Learner Centered Grading (LCG) to be a successful educational format. The utilization of the LCG Debriefing method in simulation-based training is the standardized debriefing format for a technologically dynamic industry.

The aim of this research was to examine the LCG debriefing approach and determine the added value of the approach using a scenario-specific behavioral checklist as an instrument for the nursing faculty and the learner to assess the learner's performance. A repeated measures was conducted to evaluate whether there were differences between the control and treatment groups across the pre and post-test. The test statistic demonstrated no statistical significance between the control and treatment groups. Results of Pearson's correlations showed that self-efficacy was not significantly correlated with change in performance by debriefing method.

A number of factors contribute to this finding, one of which is the small sample size. The small sample size led to insufficient power to detect an effect if one did exist. Other factors included time allotted for data gathering, simulation space availability and participants' prior exposure to the control debriefing method.

This study served as a pilot for future research. Implications for the next study include extending the time allotted for gathering data to allow for a larger sample size, utilizing the Certified Healthcare Simulation Educator (CHSE) designees to function as facilitators as well as evaluators and to design the study to evaluate performance immediately after the debriefing session and once again at a different interval of time. A second simulation session conducted one week after the initial participation would be beneficial to evaluate if knowledge acquisition occurred.

CHAPTER ONE:

INTRODUCTION

Background of Problem

An insufficient number of nursing faculty, limited clinical placement sites, and classroom space are identified as the primary barriers to accepting all qualified nursing students (American Association of Colleges of Nursing, 2006). With the increase in demand on clinical sites for nursing students to learn and apply acquired knowledge, a reduction in access to these limited sites has resulted (Schoening, Sittner, & Todd, 2006). The demand for clinical sites is a problem common for schools of nursing across the country; in 2005, San Diego County had 14 nursing schools make 2,272 requests for clinical placement (Burgess & Ruiz, 2005). In an attempt to address the limited clinical placement sites problem, The Florida Board of Nursing under the Department of Professional Regulation had deemed that Florida nursing schools can replace up to 25% of clinical hours with simulation. In 2014, the percentage of clinical hour replacement permissible increased to 50% in the State of Florida (Florida Senate Bill No. 1036).

Even with optimal clinical situations, nursing students are presented with different patients, different disease processes and subsequently different learning opportunities. Clinical opportunities for nursing students vary across health care settings, it is difficult to ensure that all students obtain the clinical experiences needed to meet learning objectives (Larew, Lessans, Spunt, Foster, & Covington, 2006). One student nurse may have the occasion to perform a specific procedure while another does not. The nature of clinical learning is that clinical opportunities vary depending on the

care needs of the available patients and hospital rotations do not guarantee the same clinical experience for each nursing student (Larew et al., 2006).

The nursing faculty shortage compounded with limited clinical access requires the use of new strategies that provide students with consistent experiences while easing the burden on the faculty resources. Faculty must prepare students to enter a fast-paced work environment and that preparation must translate into confident, competent, safe healthcare providers (Schoening et al, 2006). As patients' severity of illness increases, the medical/surgical units are finding more critically ill patients on their units and nurse educators are responsible for preparing students to function in a more acute clinical environment (Spunt, Foster, & Adams, 2004).

Human patient simulators (HPS) are gaining acceptance as an additional tool in the educational process of nursing students (Henneman, Cunningham, Roche, & Curnin, 2007). Simulation technology is a safe, experiential environment providing students with opportunities for decision making, critical thinking, self-confidence and team building (Medley & Horne, 2005). The HPS provides nursing faculty with the opportunity to provide students virtual clinical experiences and opportunities to apply knowledge and use skills that they may not encounter while in clinical rotations. During simulation experiences, time may be suspended, giving students the time to think critically, make decisions and act (Parr & Sweeney, 2006). Simulation allows participants to experience an authentic situation without patient risk (Larew et al., 2006) and with varying levels of realism (Feingold, Calaluce, & Kallen, 2004).

As the demand for clinical placement sites continues to exceed the available supply, clinical experience alternatives are needed. Simulation has become a component of nursing education providing faculty the opportunity to provide alternate, equitable clinical experiences. Subsequently, boards of nursing (BONs) have received requests from colleges and schools of nursing to exchange some of the required minimum number of clinical hours with simulation education. The greatest

challenge for the BONs centered on the lack of existing research identifying the appropriate exchange of clinical hours for simulation hours. The National Council of State Boards of Nursing (2014) reported on a longitudinal, multi-year, multi-site study on simulation in prelicensure nursing education. It was a two part study design. Part I studied nursing students throughout their nursing education and Part II was conducted during the participants' first 6 months of practice following graduation. "The results of this study provide substantial evidence that substituting high-quality simulation experiences for up to half of traditional clinical hours produces comparable end-of-program educational outcomes and new graduates that are ready for clinical practice" (Hayden, Smiley, Alexander, Kardong-Edgren & Jeffries, 2014, p.S3).

A key component to effective simulation-based-training is the debriefing session aimed toward promoting reflective thinking following the simulation exercise (Decker, et al., 2013). There is no consensus within nursing on a best practice method for debriefing following simulation-based-training. The Learner Centered Grading (LCG) method of debriefing is considered a best practice of debriefing scenario-based-training for general aviation pilots.

Significance of Study

There is no consensus within nursing on a best practice method for debriefing students following simulation-based training. A recognized, standardized method does not exist, and various methods are utilized within the domain. Nursing is a discipline that experiences the rapid development and introduction of new technologies. The associated challenges include the need for new and innovative opportunities to support student learning. The need begins with the initial training and requires the identification of ways to insure clinicians keep current. Developing accurate self-assessment skills that promote life-long learning well after the instructor is no longer present, must be an outcome of simulation-based education.

The similarities between aviation and healthcare are well documented (Murphy, 2006; Thomas, 2006; Karl, 2009; Durso & Drews, 2010; Bernstein, 2012; Nance, 2012; Skiles, 2012). Training members of both disciplines require standardization and methods of best practice. The Federal Aviation Administration sponsored an initiative that found Learner Centered Grading (LCG) to be a successful educational format. The utilization of the LCG Debriefing method in simulation-based training is the standardized debriefing format for a technologically dynamic industry.

In aviation, the LCG Debriefing method has been demonstrated to be effective and subsequently is the standardized debriefing method adopted by the Federal Aviation Administration. Given the similarities between aviation and healthcare, an examination of the LCG debriefing method in the nursing domain is warranted.

The purpose of this research was to examine the LCG debriefing approach for the nursing faculty and the learner to assess the learner's performance.

Specific Aim

This study focused on a comparative evaluation of two debriefing strategies. Specifically this investigator proposed to:

Aim: Estimate the difference between an instructor-led critique of performance and LCG debriefing strategies on the demonstration of performance of nursing skills related to task management and use of resources in a simulated acute care setting.

Theoretical Framework

Kolb's Experiential Learning Model. Kolb (1984) described learning as "the process whereby knowledge is created through the transformation of experience" (p. 38). This process he posited is continuous and cyclical. Kolb drew from Lewin's Experiential Learning Model whose characteristics serve to define the nature of experiential learning. This model emphasizes the central

role that experience plays in the learning process. “Learning is conceived as a 4-stage cycle; concrete experience is the basis for observation and reflection” (Kolb, 1984).

The Experiential Learning Model consists of four learning steps: concrete experience, reflective observation, abstract conceptualization and active experimentation. These steps relate to the various facets of simulation and debriefing. Participation in simulation is reflected in the concrete experience step where the learner engages in an experience. Contemplating about the experience is oriented in the reflective observation step. In abstract conceptualization, the participant/learner evaluates the simulation experience, what actions and/or interventions should be improved, eliminated or enhanced. Bringing the simulated experience learning into the clinical environment practice is seen in active experimentation (Poore, Cullen, & Schaar, 2014).

Kolb (1988) noted that “learning requires abilities that are polar opposites”(p. 236). As learning is undertaken, the learner must decide which abilities need to be employed. He identified two dimensions of the learning process. “The first dimension represents the concrete experiencing of events, at one end, and abstract conceptualization at the other” (Kolb, 1988, p. 236).

Research Hypothesis

The individuals who are debriefed using the LCG debriefing strategy will demonstrate better performance on nursing skills than will the individuals who are debriefed using the an instructor-led critique of performance debriefing strategy.

Research Question 1: Is there a greater improvement in performance in a simulated clinical encounter following LCG debriefing than with instructor-led debriefing?

Research Question 2: Is there a difference in change in performance by debriefing method based on self-efficacy at baseline?

Definitions of Terminology

Simulation

Simulation is the technique of imitating the behavior of some situation or process by means of a suitably analogous situation or apparatus, especially for the purpose of study or personnel training (Bradley, 2006).

Human Patient Simulator

The Human Patient Simulator (HPS) is a high-fidelity mannequin that mimics the anatomy and clinical functioning of a human being. Computer software is used to provide a voice, pulses, vital signs, heart sounds, lung sounds, bowel sounds, respiratory patterns and other physiological functions and when programmed, the HPS can respond to medical and pharmacological intervention.

Debriefing

Debriefing is "the process by which the experience of the game/simulation is examined, discussed and turned into learning" (Thatcher, 1986, p.270).

Instructor-led critique of performance debriefing strategy

An instructor-led critique of performance debriefing strategy consists of an instructor-led discussion wherein the instructor provides observations and comments on what the learner did right and wrong. This debriefed learner receives the information in a lecture-like format and typically does not contribute to the analysis of their performance.

Learner Centered Grading Debriefing

Learner Centered Grading Debriefing (LCG) consists of directing the learner to actively evaluate their performance and to speculate on corrective actions as needed. This is accomplished by guiding the learner to "uncover and articulate their own mistakes, recognize the limit of their own

knowledge, and to place appropriate value on their own observations” (Ayers, 2008, p.27). In LCG the learner is considered a full partner in the debriefing process.

Cerebral Vascular Accident (CVA)

A Cerebral Vascular Accident (CVA) occurs when the flow of blood to the brain ceases. A CVA is also referred to as a stroke. “If blood flow is cut off for longer than a few seconds, the brain cannot get blood and oxygen. Brain cells can die, causing lasting damage” (PubMed Health, 2013).

Simulation Facilitator

During simulation “the facilitator guides and supports participants to understand and achieve the objectives (Boese, et al., 2013, p. S23).

Debriefing Facilitator

During debriefing “the facilitator leads the participants in identifying the positive actions, the actions that could have been changed to promote better patient outcomes, and how the actions could have been changed to meet the learning objectives, if these objectives are not met” (Boese, et al., 2013, p. S23).

Chapter Summary

As student enrollment increases, the demand on clinical sites for nursing students to acquire knowledge experientially also increases. Even with optimal clinical situations, nursing students are presented with different patients, different disease processes and subsequently different opportunities. As clinical learning opportunities for nursing students vary across healthcare settings, learning varies.

Simulation-based learning provides an answer to both limited clinical placement opportunities and variation in clinical opportunities. Simulation provides nursing faculty with the opportunity to provide students virtual clinical experiences and skills that they may not encounter

while in clinical rotations. A key component to effective simulation-based-training is the debriefing or discussion following the simulation exercise. Nursing lacks consensus on a best practice method for debriefing following simulation-based-training. The LCG method of debriefing is considered a best practice of debriefing scenario-based-training for general aviation pilots.

Chapter two will address the similarities between aviation and healthcare and will demonstrate an examination of the LCG debriefing method in the nursing domain is warranted. Relevant literature will be reviewed.

CHAPTER TWO:

REVIEW OF LITERATURE

Clinical simulation is at the point of having a significant impact on health care education both in undergraduate and postgraduate instruction. The use of simulation ranges from the simple reproduction of isolated body parts to complex human interactions portrayed by simulated patients or high-fidelity HPS which replicate whole body appearance and a variety of physiological parameters. Nurse educators are challenged to prepare students to function in a more acute and technically sophisticated clinical health care setting. Simulation is an integral tool in nursing education. Research on simulation as it effects or enhances student nurses' knowledge, learning, self-confidence, self-efficacy, decision making, shared cognition, locus of control and critical thinking has been studied to varying degrees. Numerous publications have addressed the process of developing healthcare simulation centers and the logistics involved in the creation, financial impact and staffing demands of such ventures. Human Patient Simulators offer students an array of learning experiences and the opportunity to practice skills in a variety of scenarios.

Simulation in Healthcare History

Human Patient Simulator. Early studies documented the success of using the HPS in improving student's acquisition and retention of knowledge and skills better and quicker than traditional educational methods in a variety of settings from anesthesia training to emergency medicine and trauma (Abrahamson, Denson & Wolf, 1969; Good, Gravenstein & Mahla, 1992; Chopra, Gesink, Dejong, Bovill, Spierdijk & Brand 1994; Gaba, Howard, Flanagan, Smith, Fish, & Botney 1998; Issenberg, McGaghie, & Hart, 1999). Farnsworth, Egan, Johnson, and Westenskow (2000) demonstrated that the HPS is an effective tool to teach nurses sedation and analgesia skills

and techniques. The Haskvitz and Koop (2004) study suggests the use of HPS as a valuable tool in remediation of routine clinical performance for nursing students. The HPS, as an educational strategy for remediation, allows for numerous individualized sessions until proficiency in the designated skills is achieved without an increase in student frustration and stress level. The study made reference to the potential use of the HPS in decreasing clinical errors resulting in increased patient safety and cost savings (Haskvitz & Koop, 2004).

Feingold, Calaluce & Kallen (2004) evaluated the perceptions of senior undergraduate nursing students and faculty members regarding the use of the HPS. The researchers documented that most students and faculty members identified the use of this educational methodology as realistic and valuable. They found that although 100% of the faculty members believed that skills learned with the HPS would transfer to a real clinical setting, approximately half of the students did not believe in this transferability (Feingold et al, 2004). A later study by McCausland, Curran, and Cataldi (2004) documented that 97% of the students felt that the simulation experience would help in future critical situations.

Friedrich determined the use of the patient simulator to be a risk-free method to integrate basic and clinical science for first year medical students as well as a strategy to standardize and replicate skills within the curriculum (Friedrich, 2002). Friedrich proposed that this type of learning environment could stimulate students to learn critical thinking skills by becoming “emotionally engaged” in a care process (Friedrich, 2002, p.2809). Emotionally engaged students integrate and understand the information at a deeper cognitive level because the emotional involvement allows students to “create a framework on which they hang important intellectual concepts” (Friedrich, 2002, p.2810). Other research documents that HPS technology provides the risk free opportunity for students to experience preprogrammed rare events, to repeat procedures and learn by making errors, to observe different outcomes stemming from specific actions chosen that will not harm an

actual patient, and to practice as a real team with debriefing sessions (Morton, 1997; Beyea, & Kobokovich, 2004).

Wyatt, Fallows and Archer, (2004) documented the efficacy of the HPS in reducing errors in clinical performance when compared with the case study educational method in novice paramedics. The Institute of Medicine report, *To Err Is Human: Building a Safer Health System*, recommended the use of simulators to assist in preventing errors in the clinical setting (Institute of Medicine, 2000). Earlier studies document that with HPS, beginning or practicing clinicians can learn and practice a variety of technical skills and experience management of basic and complex clinical situations in a relatively safe environment (Monti, Wren, Haas & Lupien, 1998). Practice using the HPS in the preparation of healthcare professionals can effectively eliminate some of the potential for life-threatening errors in healthcare (Monti et al, 1998).

Hammond, Hermann, Chen, and Kushins, (2002) established the evaluative role of the HPS to help identify weaknesses in a student's performance. An international survey of nursing schools and simulation centers documented the use of simulation technology in undergraduate physical assessment, advanced undergraduate medical-surgical nursing, graduate physical assessment, and nurse anesthesia courses (Nehring & Lashley 2004). This survey also documented the overall interest in the use of the HPS in the assessment and development of critical thinking and clinical reasoning skills, the synthesis of knowledge, and the comfort and confidence in the practice for real life situations (Nehring & Lashley 2004).

An analysis of the ten articles reviewed (Appendix A), revealed that only one study addressed the content validity of the research instrument used. However, for this instrument only two experts were utilized instead of the standard five to seven experts (McMillan, 2008). None of the articles documented reliability. Seven of the ten studies evaluated the intervention of the experimental group without evaluating the results of or inclusion of a control group. All the subjects in these ten

studies were students and all the subjects were acquired by convenience sample. Five of the studies reported no statistical data analysis although positive anecdotal findings were documented. One study reported means and standard deviations of the participants' response to the simulation experience without any further statistical analysis. This study also described positive anecdotal findings. Another study included positive anecdotal documentation and only mean scores.

The Scherer, Bruce and Runkawatt 2007 study of nurse practitioner students comparing clinical simulation and case study presentation on their knowledge and confidence in managing a cardiac event resulted in no statistically significant differences in knowledge scores. This study also found that the confidence scores were higher in the case study control group than in the clinical simulation experimental group however; there was no documentation on the validity and reliability of the instruments used. The students in the clinical simulation experimental group participated individually in the scenario which was allowed to run up to 20 minutes. The exercise was video-taped and the taping was reviewed during the debriefing portion of the study which was held following the completion of the simulation. The students in the case study presentation control group participated as a group, were allowed open discussion and could direct their assessment and management of the patient on advice from fellow students. The documented results are suspect based on the lack of validity and reliability of the instruments used and the design methodology of the study.

Annual competency assessment of registered nurses is a component of hospital staff development. The goal is to provide nursing staff with quality educational programs and resources. Przybyl, Androwich and Evans (2015) included a structured simulation exercise into an existing continuous renal replacement therapy (CCRT) educational program. There were 93 nurses who participated in the evidence-based study. The results of the study included an increase in the

understanding of CRRT principle, critical thinking skills and an overall nurse satisfaction (Przybyl, Androwich & Evans, 2015).

Cummings (2015) utilized simulation to assess students' readiness to enter into practice. Eighty senior students in a bachelor's nursing program participated individually in simulated scenarios. These students had previous simulation experiences however; in groups of 3 or 4 student participants and never as the individual clinician. Results indicated problems with medication usage, incomplete assessments and correctly prioritizing care. The primary investigator addressed the benefit of conducting this simulation-based learning experience, "by placing the student in an individual evaluation experience, the evaluator can identify errors in critical thinking and performance that may not be clear in other circumstances (classroom or clinical evaluation)" (Cummings, 2015, p. 114).

Simulation is in the early stage of becoming an integral tool in nursing education. There are many areas of study needed to quantify and qualify this strategy as a mainstay in nursing education. Research studies comparing simulation methods to didactic methods, longitudinal studies addressing knowledge acquisition and retention, the effect if any on performance, proficiency, self-confidence, decision making and critical thinking are all needed. However sound research methodology, data collection and analysis must become a standard for all future studies. The National Council of State Boards of Nursing longitudinal study evaluating replacing clinical hours with simulation in pre-licensure nursing education, literature review concluded with a call for the need "for rigorous (simulation) research that is appropriately powered with a controlled comparison group" (Hayden, et al., 2014, p. S5). Specific attention to the research methodology employed, random assignment of subjects, inclusion of control and experimental groups, the selection of instruments and the utilization of reliable and valid psychometric measurement will insure that the reported results are indeed measuring that which was intended to be measured.

Self-Efficacy

The challenge for classroom education is that it is often difficult to apply the learned information within the actual clinical environment (Benner, 1984). Simulation can be a bridge between learning in the classroom and practicing the skills with actual patients. Actual patient situations through scenarios and critical thinking exercises can be provided in the safe environment of the simulation laboratory with a human patient simulator that can respond to the nursing students' decisions and actions. Critically ill patients often remain on the medical-surgical units, thus medical emergencies are managed more often by staff on general units and students' exposure to management of medical emergencies in the clinical setting is inconsistent (Spunt, Foster, & Adams, 2004).

Efforts must be made to build confidence in students by educators who help students build on improving their clinical skills (Haffer & Raingruber, 1998). Logstrup (1971) describes confidence as deriving from an authentic grasp of situations. Clinical scenarios are a close approximation of clinical practice and they incorporate context rich information allowing students to be exposed to the type of decision making that actually occurs in practice. This type of format provides students with opportunities to assert themselves confidently (Haffer et al., 1998). Benner, Hooper-Kyriakidis, and Stannard (1999) stress that in order to learn to respond quickly in an emergency situation the nurse needs to practice within actual patient emergencies.

The predominant goal of education is to cultivate and nurture in each student a knowledge and skill level. To use the knowledge and skills acquired there must also be a confidence level on the part of the student (Popovich, 1991). In 1986, Bandura proposed a self-efficacy theory to evaluate the role of an individual's belief in his/her competence or expectancy. The theory is based on what people think, believe and feel affects how they behave (Resnick, 2009). People's judgment

of their ability to successfully accomplish that which is attempted is at the center of human functioning.

Self-efficacy beliefs provide the foundation for human motivation, well-being, and personal accomplishment. This is because unless people believe that their actions can produce the outcomes they desire, they have little incentive to act or to persevere in the face of difficulties (Pajares, 2002, p.1).

An individual's outcome expectation is based in large part to their self-efficacy expectations (Bandura, 1997; Resnick, 2009). The types of outcomes people anticipate generally depend on their judgments of how well they will be able to perform the behavior (Resnick, 2009). "Self-efficacy is a principle connection between knowledge and action since the belief that one can do a behavior usually occurs before one actually attempts the behavior "(Lawrance & McLeroy, 1986, p. 317).

Bandura (1986) theorized that one's self-efficacy expectations, or the belief in one's capability to organize and execute a course of behavior or action required to achieve a type of performance or outcome, is a central mechanism in predicting the acquisition and performance of behaviors necessary for competent functioning. Effective, competent functioning requires skills and the efficacy beliefs to use these skills well (Bandura, 1997). If an individual has the necessary skills and knowledge and positive outcome expectations, and personally values the outcome, the self-efficacy expectations ultimately determine an individual's decision to engage in a behavior. It also determines an individual's willingness to persevere when confronting obstacles and their level of resilience needed to face adverse situations (Bandura, 1997). It is hypothesized that individuals who have high self-efficacy will put forth more effort and persist longer when challenged than those who have low self-efficacy (Schunk, 1991). Individuals with high self-efficacy have a greater intrinsic interest and deep engrossment in activities, set themselves challenging goals while maintaining strong commitment to themselves, and heighten and sustain their efforts in the face of encountered

failure (Pajares, 1996; Schunk, 1991). The definition of self-efficacy includes belief in the ability to organize and execute a course of action and is used in reference to some type of goal to attain designated types of performance (Pajares, 1996; Schunk, 1991). Self-efficacy deals primarily with cognitive judgments of one's capabilities based on mastery criteria.

Since introduction of the term self-efficacy, it has been used interchangeably with self-confidence (Bandura, 1997; Grundy, 1993; Schunk, 1996). There are some differences between self-efficacy and self-confidence beliefs. Self-confidence measures general/global and/or tasks-specific domains of functioning whereas self-efficacy measures tasks-specific domains of functioning. Self-confidence applies to use in various situations or across domain of functioning while self-efficacy applies to use in specific situations or in reference to some type of goal (Bandura, 1997; Grundy, 1993; Schunk, 1996). For the purpose of this study the definition of self-confidence is derived from the Bandura self-efficacy theory.

Bandura (1986) notes that belief in one's self-efficacy is used in reference to a specific type of goal and in harmony with one's skills/knowledge to help attain designated types of behavior. To function in clinical situations in any health care profession requires critical thinking and application of knowledge, a capability to reason, and an ability to put in context a given situation (Seldomridge, 1997). To be an effective nurse requires a confidence in one's ability to use these skills when performing tasks, most notably when responding to emergency situations. Confidence in the ability to perform tasks is an important quality for an undergraduate baccalaureate student to be successful while enrolled in the nursing program and ultimately important to function as a licensed practitioner.

A review of literature conducted by Leigh (2008) on high-fidelity patient simulation and nursing student self-efficacy revealed six themes associated with improved self-efficacy. The themes included an increase in self-efficacy after participation in simulation; greater self-confidence with a simulation experience than a written case study; increased confidence in technical skills; an

associated increased motivation to continue the simulation experience; reduced level of stress when in the hospital setting; an increased level of confidence when caring for patients and higher level of confidence when dealing with the unexpected (Leigh, 2008).

An evaluation of the impact of simulation on the self-efficacy of communication skills in nursing students during a psychiatric nursing course was conducted. The results found that the simulation experience enhanced students' self-efficacy of their communication skills (Kameg, Howard, Clochesy, Mitchell & Suresky, 2010). Anecdotal comments included in the Simulation Evaluation Survey indicated that those who participated in the simulation experience found it to be a good learning opportunity and beneficial in understanding how best to communicate with an individual in a psychiatric crisis situation (Kameg, et al., 2010).

Cardoza and Hood (2012) conducted a 2-year study to evaluate baccalaureate nursing students' self-efficacy before and after simulation. Two groups of participants were required to complete the General Self-Efficacy (GSE) scale at four time points during their 7-week pediatric course. Study results indicated that both groups reported a high self-efficacy level at the first time point with a recognized loss of self-efficacy at the second time point. The two remaining time points found a marginal increase from time 2 to time 3 and again from time 3 to time 4 (Cardoza & Hood, 2012). The researchers reported that the outcome of this simulation study served to integrate technology into the nursing curriculum and include simulation in courses across the curriculum (Cardoza & Hood, 2012).

Debriefing

Debriefing is an activity whereby students and faculty engage in evaluation of what occurred, what could be improved upon and what was learned during the simulation experience (Jeffries & Rogers, 2007). Brett-Fleegler et al., (2012) defined debriefing as a “a facilitated conversation after such things as critical events and simulations in which participants analyze their actions, thought

processes, emotional states, and other information to improve performance in future situations” (p. 288).

Although a debriefing session could be conducted any time after the simulation experience, it is recommended that it occur immediately after the experience in order to avoid distortion of feelings, thoughts or memories over time (Jeffries & Rogers, 2007). Identification of mistakes and discussions of alternative approaches may assist participants in realizing the difference between their performance and the objectives of the simulation learning experience (Peters & Vissers, 2004).

Military. In the United States Army, debriefing is known as after-action reviews (AAR). An AAR is defined as “a professional discussion of an event, focused on performance standards, that enables soldiers to discover for themselves what happened, why it happened, and how to sustain strengths and improve on weaknesses” (Department of the Army, 1993, p.2). The Army conducts after-action reviews during or immediately after each event. A key aspect of AAR is the setting in which it is conducted. It must be an environment in which:

soldiers and leaders openly and honestly discuss what actually transpired in sufficient detail and clarity that not only will everyone understand what did and did not occur and why, but most importantly will have a strong desire to seek the opportunity to practice the task again. (Department of the Army, 1993, p.1).

First Responders. Critical Incident Stress Debriefing (CISD) was introduced to the fire and emergency medical services community in 1982 by Jeffery Mitchell, PhD, a volunteer firefighter (Mitchell & Everly, 1996). A prominent goal of CISD is the prevention of chronic posttraumatic stress disorder (PTSD), a type of anxiety disorder triggered by a traumatic event (MayoClinic, 2009). The CISD is conducted as a structured group discussion lasting one to three hours taking the participants through a seven phase process (American Red Cross, 2006; Mitchell & Everly, 1996;

Weisberg, 2006). The debriefing takes place from one to 10 days after the critical incident occurrence (American Red Cross, 2006).

In 2006, the American Red Cross Advisory Council on First Aid and Safety published a Scientific Review on Critical Incident Stress Debriefing. The review was prompted by concerns of “several authors and organizations” regarding the absence of “sound scientific foundation” which CISD is based (American Red Cross, 2006). The concerns included the hypothesis that not only does CISD “lack benefit but also worsens, rather than improves the outcome” (American Red Cross, 2006, p. 1). The review process and literature search concluded in the following published guidelines:

There is no convincing evidence that psychological debriefing or group debriefing are effective in reducing PTSD. There is evidence that the CISD process may have deleterious effects. As such the CISD process should not be used for rescuers following a traumatic event (American Red Cross, 2006, p. 1).

Education. In educational simulation, debriefing occurs immediately after the completion of the experience. The purpose of debriefing is to provide the participant the opportunity to reflect on the experience, evaluate their performance, learn experientially and enhance understanding (Fanning & Gaba, 2007, Henneman, Cunningham, Roche, & Curnin, 2007; Jefferies, 2005; Kolb & Lewis, 1986; & Larew, Lessans, Spunt, Foster, & Covington, 2006).

The majority of research on simulation debriefing is found in education as well as simulation and gaming studies. Prior to 2010, only two dissertations whose area of research was simulation debriefing were published in the ProQuest Dissertations and Theses database. Hankinson (1987) studied debriefing after a simulation game and Wighton (1991) researched applying Kolb’s Model of experiential learning to simulation debriefing.

Since 2010, nine dissertations and one thesis, studying simulation debriefing, were published in the ProQuest database. All ten authors were registered nurses researching various aspects of simulation debriefing in nursing education. These studies did not evaluate the LCG debriefing method nor did they draw from any debriefing research conducted in the aviation domain. One study addressed the lack of consensus in nursing education for a best practice approach to debriefing (Willard, 2014). Although this study concluded with no statistical significance in knowledge acquisition between the structured and non-structured groups, statistical significance was noted with student preference of structured debriefing. Willard (2014) concluded that implications for further research “should strive to identify the most effective debriefing approaches for use in nursing simulation” (p.3).

Crookall (1992) observed that “debriefing is perhaps the most important part of a simulation/game, and yet it tends to be the most neglected, if not in practice, at least in the literature” (p. 141). Petranek (2000), reported that the simulation and gaming field has stressed the value of debriefing, specifically oral debriefing after simulation learning exercises. This is done in order that the simulation activity is grounded in purpose and the theoretical foundation of experiential learning. He contends that the exclusion of debriefing in an article submitted to *Simulation & Gaming* journal would result in automatic rejection. In the 1992 special issue of *Simulation & Gaming*, the importance of debriefing was addressed. Simulation games used for training or education place the participants into an environment that closely resembles reality in order to obtain specific knowledge or skills. Debriefing sessions focus on the individual’s performance with an emphasis on associating a participant’s understanding of learned knowledge and its relationship to the required skills and knowledge in the “real-life situation” (Peters & Vissers, 2004). Identification of mistakes and discussions of alternative approaches may assist participants in

realizing the difference between their performance and the objectives of the simulation learning experience (Peters & Vissers, 2004).

Approach to Debriefing. The facilitator must provide a non-threatening, safe environment where the participant feels secure to ask questions, express concerns and learn from mistakes without fear of embarrassment, reprisal or damage to self-worth (Fanning & Gaba, 2007). An aspect of participation in simulation is the vulnerability experienced by participants. The participants in a simulation are expected to act as themselves and are not asked to play a role (Peters & Vissers, 2004). The facilitator must be constantly observant and respectful of the vulnerability and must provide an environment which is favorable to freedom of expression and license to make mistakes (Fanning & Gaba, 2007).

The Facilitator. A debriefing facilitator's skills and thorough understanding of the objectives and specifics of the simulation are "paramount" in providing the participants with the best learning experience (Peters, & Vissers, 2004; Fanning & Gaba, 2007). Facilitating debriefing differs from teaching in that "facilitators aim to guide and direct rather than to lecture" (Fanning & Gaba, 2007, p. 117). A debriefing facilitator who also acts as the simulation facilitator must maintain a "detached" position, not giving participants the impression of "taking a side" (Peters, & Vissers, 2004, p. 81)

Healthcare. Prior to 2009, few studies in the healthcare field address the inclusion of debriefing as a step in the process of simulation. Only a few, medical and nursing research studies were found which specifically studied the effects of debriefing in clinical simulation. At the time, PubMed, CINAHL, MEDLINE, PsychINFO, Academic Search Primer and Health Reference Center Academic databases were searched. Using the parameter, document title, the keywords used were "simulation" and "debriefing" resulting in 43 citations. Citation duplication occurred between the databases resulting in 14 citations which were present in some or all of the databases.

The relevance of debriefing as an integral part of learning is beginning to be realized in healthcare simulation. However, little is known about ways to design and conduct a debriefing session (Peters, & Vissers, 2004). Theory on the process of debriefing is scarce. Miller's study (as cited in Wighton, 1991) suggested that the reason debriefing has been neglected is due in part to the absence of a learning theory that could explain the practice.

Rall, Manser, and Howard, (2000) conducted a small survey at 14 European simulator centers and during a simulator workshop on the key elements of debriefing. Respondents maintained that debriefing is "crucial for a successful learning process," however they warned that if done poorly, debriefing can cause harm to the participant (Rall, et al., 2000, p 519). They described debriefing as the "heart and soul of simulator training" and the emphasis on debriefing was of such importance that it could "make or break" the simulation session (Rall, et al., 2000, p.516). Their results addressed elements of successful debriefing which included positive reinforcement of the participants and outlined behaviors that should be avoided that included the use of destructive language (Rall, et al., 2000).

Methods of Debriefing in Nursing. Debriefing can be conducted a number of ways such as oral discussions, written responses and descriptions, journaling, Wiki, discussion boards, etc. Whether the facilitator selects one format or a combination of formats, there are a variety of available configurations. When it comes to the method of best practice within the nursing discipline, there is no consensus (Neill & Wotton, 2011).

Instructor-led Method. In the instructor-led method of oral or discussion style of debriefing, the leader or instructor informs the participants what went right and what went wrong. Most often the information is presented in broad strokes such as "Your team did a good job of assessment" or "Many of you needed to address the signs and symptoms of COPD better." It is conducted in an instructor-led lecture format rather than student guided; participants receive the information in a

passive manner rather than actively participate in the discussion. It typically occurs with a group of participants, and it often becomes a form of generalized discussion.

Outcome Present State-Test (OPT) Model. Recent research has examined use of debriefing to improve clinical reasoning skills. Briefly, the Outcome Present State-Test (OPT) Model is a nursing process model designed to help students develop clinical reasoning skills and advocates use of creative thinking while emphasizing the importance of focused patient outcomes (Pesut& Herman, 1998). Despite the importance of clinical reasoning in nursing, very little literature and evaluation studies regarding this method exist. Interestingly, however, one study points to the value of guided reflection for improving this important skill. Kautz, Kuiper, Pesut, Knight-Brown and Daneker, (2005), assessed 23 junior baccalaureate nursing students development of clinical reasoning skills during a ten-week medical-surgical clinical experience using the OPT model. The combination of the OPT model with guided reflection demonstrated an enhanced clinical reasoning skill acquisition (Kautz, et. al., 2005). Guided reflection can be one component of debriefing.

Bartlett, et al. (2008) evaluated the OPT Model in an undergraduate psychiatric-mental health nursing course. A total of 43 students participated in the study over one semester. A criterion score was established with 14 students unable to meet the requirement. The researchers concluded “further research is required to confirm that the OPT model is effective in developing nursing students’ critical thinking and clinical reasoning skills” (Bartlett, et al., 2008, p. 7).

Gather-Analyze-Summarize (GAS) Model of Debriefing. The GAS Model of Debriefing was developed by the American Heart Association to teach instructors effective, structured debriefing skills for learners in the organization’s life-saving courses (O’Donnell et al., 2009). The facilitator begins by gathering the participant’s assessment of their performance. Immediately after the gathering phase, the instructor analyses the participant’s assessment and addresses correct and

incorrect observations. In the final phase, the facilitator guides the participant as they identify lessons learned and ways to improve.

Debriefing for Meaningful Learning (DML). Additionally, Dreifuerst (2010) introduced the concept of “Debriefing for Meaningful Learning” (DML), a faculty-facilitated guided reflection teaching strategy as a method to improve clinical reasoning skills. Dreifurst sought to understand if the DML strategy positively influenced the development of clinical reasoning skills in undergraduate nursing students, as compared to usual and customary debriefing. The Dreifuerst study examined the effectiveness of DML to development of clinical judgment and clinical reasoning skills of undergraduate baccalaureate nursing students. The study of 240 students indicated that while the students’ perceived the DML strategy to be of higher quality than the usual and customary debriefing, no significant difference in clinical reasoning skills occurred between the experimental and control groups.

3D Model of Debriefing. The 3D Model of Debriefing is a structured framework for facilitators based on the key components of Defusing, Discovering and Deepening. The goal of this model is to “help debriefers facilitate learning to improve daily practice and patient outcomes” (Zigmont, Kappus & Sudikoff, 2011, p.52). Similar to the GAS Model of Debriefing, the phases require the participant to self-evaluate simulation performance, and to identify lessons learned in order to implement the acquired knowledge in future clinical experiences. The uniqueness of the Defusing phase recognizes the emotional impact of the simulation experience and the vulnerability of the simulation participant. During this phase, time is taken to address the emotional impact and effect on the participant. The reasoning is to transition the participant from “what happened to why it happened” in order for learning to occur (Zigmont et al., 2011, p.56).

TeamGAINS. This debriefing model was designed as a “structured debriefing tool for simulation-based team trainings in healthcare” (Kolbe et al., 2013, p.541). Integrated in this model

are guided team self-correction, advocacy-inquiry and systemic-constructivist techniques. Self-assessment of simulation performance is guided by the facilitator. The facilitator may add their analysis of the self-assessment however; only after the participants have completed their commentary. During the advocacy-inquiry phase of debriefing, the assessment is instructor-led identifying gaps in performance. This phase is identified with “an approach for expert judgment” whereby the instructor asks specific questions about specific actions requiring the participant to voice the “why” they engaged in a certain action (Kolbe et al., 2013, p.542). The systemic-constructivist phase is intended to assist the participants with “looking at patterns and dynamics of interactions and relationships rather than on isolated individual behavior” (Kolbe et al., 2013, p.542). During this phase, the facilitator would ask one individual to describe the interaction between two other individuals in order to track team behaviors.

Method of Debriefing in Surgery.

SHARP. The SHARP Method was developed to improve debriefing in surgery (Ahmed et al., 2013). The method consists of five phases and unlike the previously mentioned methods, the SHARP method identifies the first phase prior to the experience. In the initial phase, the participants are required to set the learning objectives by identifying what they “would like to get out of this case” (Ahmed et al., 2013, p. 959). The four remaining phases occur after the surgery is completed and similar to the methods previously addressed, three of the phases require participants to evaluate their performance, address concerns, and identify actions to improve performance in future surgical experiences. Because this method requires the participants in the pre-surgical experience phase to identify learning objectives, during the post-surgical experience they must evaluate if the pre-identified learning objectives were met. Another quality of this debriefing method that makes it unique is that it was designed to be utilized in an actual healthcare experience rather than a simulated experience.

The nursing domain is certainly not alone in its need for effective debriefing. Aviation has a long history of simulation-based training as well as debriefing. A review of the aviation debriefing research may provide useful insights to nursing debriefing. But to begin, a discussion of the similarities between the two domains is warranted.

Similarities between Healthcare and Aviation

Aviation and healthcare may seem quite different. In actuality, similarities in safety and responsibility to consumers are well documented. The most prominent similarity is that, in both industries, mistakes can result in serious bodily injury or loss of life. But the similarities go deeper. For instance, Thomas (2006) addressed the commonalities between healthcare and aviation as both being “comprised of highly trained professionals working in teams that use technology to manage hazardous processes where risk varies dramatically from moment to moment”(p. 1). Additionally, in their analysis of healthcare and aviation similarities, Durso and Drews, (2010) concluded that aviation could offer healthcare ideas that could improve patient safety.

Captain Jeff Skiles, first officer on US Airways Flight 1549, known as the Miracle on the Hudson, was the keynote speaker for the grand opening of a state of the art medical simulation center in Tampa, FL. In his address, he spoke of the importance of simulation education and addressed the similarities between his profession and that of the attendees, the majority of whom were members of various healthcare disciplines. “There are many parallels between aviation and medicine. What is shared by both industries is the challenge of training and evaluating personnel who must act instantly as teams, in ever changing environments, and with zero margin of error” (Skiles, 2012). “Providing the means and structure by which a collection of less than perfect human beings can still inevitably foster a perfect outcome is the true key to patient safety” (E. Skiles, personal communication, January 15, 2013).

The marketplace has recognized the parallel characteristics of these two industries.

In August 2011, CAE (formally known as Canadian Aviation Electronics Ltd), a global leader in flight aviation technology and simulation training, bought METI (Medical Education Technologies) a global leader in patient simulation, resulting in the creation of CAE Healthcare. In an interview with John J Nance, keynote speaker at the new CAE Healthcare Human Patient Simulation Network 2012 Conference, about the merger of an aviation company and a healthcare company he responded,

It is “the most perfect marriage of two different types of companies that you can imagine because CAE, as one of the pioneers in simulation in aviation, has learned so much, knows so much that needs to be transferred over to healthcare, not just about building the equipment and building the rooms but about the protocols and type of training and relationships and communication that are inherent to the higher status that this will eventually become” (Nance, 2012).

Michael Bernstein, then President of CAE Healthcare, remarked that improvement of patient safety was the motivation for combining these two companies. (Bernstein, 2012).

Dr. Richard Karl, nationally recognized cancer surgeon, founding medical director of Moffitt Cancer Center in Tampa, Florida, founder and chairman of the Surgical Safety Institute in Tampa, Florida and pilot remarked on the similarities between aviation and healthcare.

“In surgery and in the air, the work can seem routine, yet the overall job is highly complex and unpredictable. Stress and fatigue can affect performance. And there's the challenge of working with a team of people, any one of whom could make a mistake that could ultimately end in loss of life. Then again, a member of the team could also detect an error while it can still be fixed and save the day” (Karl, 2009).

A number of healthcare institutions have hired aviation safety specialist to assist in creating a patient-centered culture of improved communication resulting in improved patient safety. Dr.

David Gaba, associate dean of simulation-based learning at Stanford University School of Medicine commented on this trend. “It is not surprising given the similarities between health care and aviation, both involve hours of boredom punctuated by moments of sheer terror” (Murphy, 2006, p. 1).

One area of research and practice in aviation that may be useful for the nursing domain is that of post-exercise debriefing. Recent research on improving debriefing in training for general aviation pilots will be described next.

Simulation Debriefing in Aviation

Aviation is in a constant state of change. The rapid development of new aviation technologies and products has brought about associated challenges. One such challenge is pilot training. The training required for new pilots as well as established pilots in need of keeping current must be developed resulting in less training time and cost (FAA-Industry Training Standards (FITS) Program Plan, 2003). As a response to the rapid pace of development, the pronounced effect on aviation training and passenger and crew safety, the Federal Aviation Authority (FAA) developed a training program called FAA/Industry Training Standards (FITS). The Federal Aviation Administration (2003) defined the FITS Program as

“a partnership between FAA, Industry, and Academia designed to enhance general aviation safety. This is accomplished by developing flight training programs that are more convenient, more accessible, less expensive, and more relevant to today’s users of the National Airspace System” (p.1) .

The purpose of the FITS program plan is to establish training programs that provide the general aviation pilot with relevant, timely information (FITS Program Plan, 2003). At the core of the program is the commitment to improve aviation safety (FITS Program Plan, 2003). As part of the FITS program, French, Blickensderfer, Ayers and Connolly (2005) compared traditional

instrument training, referred to as maneuvers based training (MBT) and scenario-based training (SBT) for technically advanced aircraft (TAA) (French, et al., 2005).

The results argue that scenario-based training is better than task oriented or maneuvers based training on most measures of piloting and navigation proficiency as rated by experimentally blind expert raters. On the measures where statistical significance was not found to indicate SBT was better than MBT, SBT was found to at least show parity with MBT (French, et al., 2005). A key component to the FITS model was “the idea of developing the pilot’s self-assessment skills and, in doing so, promote life-long learning skills”(Halleran & Wiggins, 2010, p. 120). This component to the FITS program was labeled Learner Centered Grading (LCG). As described in Blickensderfer (2007a), following a simulation exercise, learner centered grading required the pilot-in-training to review his/her performance and evaluate him/herself according to a pre-defined list of learning objectives. After this learner self-assessment occurred, the instructor then facilitated a two-way discussion regarding achievement of the learning objectives. In this manner, the debriefing becomes highly participative for the pilot-in-training, while at the same time ensuring that the instructor feedback was provided as well.

Several examples of follow up work examining LCG appear in the literature. Ayers (2008) studied the students’ perception of the validity and reliability of LCG as it applied to a university flight training environment. The student and flight instructor’s impression of grade validity and reliability improved when the combination of LCG criteria and student-instructor collaboration occurred (Ayers, 2008). Subsequently, adoption of the LCG system for use at Embry Riddle Aeronautical University (ERAU) was the primary recommendation (Ayers was the chair of the ERAU flight department at the time). Additionally, Craig (2009) researched the effectiveness of Learner Centered Grading. Twenty-four students in training for their commercial pilot certificate participated in the study. The results demonstrated that when instructors realized the LCG sheet, a

one-page list of critical actions or elements of the lesson, could be used as a post-flight debriefing tool, student involvement and ownership in the training process increased (Craig, 2009).

Perhaps the most detailed inspection of LCG, however, came from Blickensderfer (2007a). The first portion of the work utilized interviews with flight instructors around the U.S. The content of the interviews addressed the viability of incorporating the LCG approach throughout general aviation flight training. The report concluded “quite favorable” instructor pilot responses but also identified the following needs: 1) the need to instruct the learner to become an active participant in the debriefing, 2) the difficulty in conveying the meaning of the current LCG scale to the learner, and 3) the need to give the instructors additional guidance on transitioning from the old style of debriefing to the new style (Blickensderfer, 2007a). Furthermore, Blickensderfer (2007a) provided recommendations for instructor training protocol for the LCG debriefing approach. Built upon the information garnered from the prior reports, this report provides a protocol, “based heavily on related research, in particular, the team debriefing methodology” to implement LCG debriefing methods for certified flight instructors (Blickensderfer, 2007a, p. 48). Finally, Blickensderfer (2007a) conducted a study to demonstrate, empirically, the value added of the LCG grading debriefing (Blickensderfer, 2007a). The results of this study found that the “LCG style of instructional debriefing appeared to be overall more effective than the traditional style instructional debriefing, was perceived as more thought provoking and as involving the participant to a greater degree” (Blickensderfer, 2007a, p. 70). The principal investigator concluded that

it is hoped that the general aviation pilots who were instructed using the LCG method will continue to use the methods of self-monitoring and self-critique to continuously grow and develop as pilots long after their time with an instructor has ended (Blickensderfer, 2007b, p. 5).

A study by Blickensderfer and Jennison (2008), investigated the efficacy of the LCG process in general aviation student pilots. A traditional style, instructor-led debriefing was given to the control group and the experimental group received a LCG debriefing. The experimental group's overall performance was significantly better than the control group and the LCG debriefing method was effective (Blickensderfer & Jennison, 2008).

Debriefing as a component of nursing education simulation has received limited attention. Those studies which address debriefing define it as a “reflective” action necessary for learning and an important component of simulation as a teaching strategy (Johnson-Russell, & Bailey, 2009; Kolb & Lewis, 1986). A consensus of best practice for debriefing in nursing education is an important step in the simulation pedagogy of this discipline.

Differences between LCG Debriefing and Instructor-led critique of performance Debriefing

The LCG method involves learner self-assessment of their performance following simulation-based training. The completed self-assessment is incorporated by the instructor into a debriefing session. A learner self-assessment is included to stimulate active participation in the debriefing and continuous learning long after instruction is completed.

In contrast, instructor-led debriefing consists of an instructor-led discussion wherein the instructor provides observations and comments on what the learner did right and wrong. The instructor-led debriefed learner receives the information in a lecture-like format and typically does not contribute to the analysis of their performance.

The LCG debriefing session differs from instructor-led debriefing by directing the learner to actively evaluate their performance and to speculate on corrective actions as needed. This is accomplished by guiding the learner to uncover and articulate their own mistakes, recognize the limit of their own knowledge, and to place appropriate value on their own observations. In LCG the learner is considered a full partner in the debriefing process.

Years of research on simulation-based learning in the aviation industry has identified Learner Centered Grading (LCG) to be a successful educational format. To date, the effectiveness of this promising format for maximizing the effectiveness of simulation-based education in nursing has not been assessed.

Chapter Summary

Simulation-based learning has become a key teaching strategy in healthcare education. Debriefing is identified as an integral component of simulation. The review of literature has identified the need for a best-practice method of debriefing where the participants self-assess their performance, correct or reinforce actions and transfer acquired knowledge to future clinical experiences. A number of debriefing methods have been developed in an attempt to meet this need, however; the nursing discipline lacks a consensus on a best practice method for debriefing following simulation-based-training, a recognized, standardized method does not exist.

The Learner Centered Grading method of debriefing is considered a best practice of debriefing scenario-based-training for general aviation pilots. Chapter three provides a detailed description of the study method that was used to evaluate the efficacy of Learner Centered Grading Debriefing for use in nursing education.

CHAPTER THREE:

METHOD

Study Design

This study used an experimental design to compare the effectiveness of Learner Centered Grading (LCG) to an instructor-led critique of performance debriefing strategy to increase student performance. Participants who completed an informed consent were randomly assigned to debriefing conditions as part of a simulation learning scenario, a cerebral vascular accident (CVA). This scenario topic was chosen because of its prevalence and high acuity which requires accurate, timely nursing intervention and because exposure to this simulation is experientially advantageous pre-licensure.

Educational information was given in advance of the study in order to prepare/pre-brief the participants for the experience. The information consisted of a Stroke/CVA PowerPoint presentation consisting of 35 slides. After review of the information, the participants were required to complete a seven question quiz. The participants were required to obtain a 100% score on the quiz and they had unlimited attempts to accomplish this requirement. All 20 participants received a 100% score on the quiz. Pre-brief time requirement was approximately 30 minutes.

Each participant was assessed individually. Two graduate nursing students served as facilitators responsible for guiding individual participants during simulation and conducting one-on-one debriefing sessions following each simulation. One facilitator led LCG sessions and one led instructor-led critique of performance debriefing sessions. Each simulation facilitator was responsible for ten individual participants. Debriefing sessions were held immediately following each simulation. Participants were given a ten minute break after the debriefing session. After the

break, participants repeated the same simulation a second time. Both simulation experiences, pre-debriefing and post-debriefing (40 total), were recorded to allow for visual rating of performance by two independent raters.

Measures

This study used a demographic questionnaire, a self-efficacy questionnaire, a self-assessment questionnaire and scenario-specific behavioral checklists.

Demographic questionnaire. This questionnaire consists of 6 variables being collected for descriptive purposes (see Appendix B).

Self-Efficacy questionnaire. It consists of an 8 question Likert Survey regarding the participant's self-efficacy for working with acutely ill patients in an acute care setting (see Appendix C). A score can range from 8 at the lowest to 40 at the highest. The scale was adapted from the Blickensderfer and Jennison, (2006) aviator self-efficacy questionnaire used in the empirical investigation of the Learner Centered Grading debriefing approach. The scale used in the empirical investigation was adapted from the Riggs (1989) validated scale for self-efficacy. Internal consistency was analyzed resulting in a Cronbach's alpha = .79 pre-test and .70 posttest. For this study, the questionnaire was modified for prelicensure nursing students to self-report their level of self-efficacy regarding patient care.

Self-Assessment questionnaire. This is completed only by the LCG group. It consists of a one page list of scenario events and yes/no questions regarding the participant's performance on the events (see Appendix D). A score can range from zero at the lowest to 27 at the highest. The Cerebral Vascular Accident self-assessment questionnaire consists of 27 questions. The assessment was designed to parallel the facilitator's assessment measure and was customized to the scenario. The questionnaire was adapted from the scenario created by the ECS® Program for Nursing

Curriculum Integration (PNCITTM) Cerebral Vascular Accident 3© 2007 METI, Sarasota, FL (see Appendix E).

Scenario-Specific behavioral checklist. It identifies the expected critical actions the participants were required to perform in order to successfully provide accurate, timely, evidence-based care (see Appendix F). The behavioral checklist was adapted from the scenario created by the ECS® Program for Nursing Curriculum Integration (PNCITTM) Cerebral Vascular Accident 3© 2007 METI, Sarasota, FL. The checklist is divided into two stages of disease progression and care. In State 1 of the scenario there are 12 identified expected critical actions. In State 2 of the scenario there are 15 identified expected critical actions.

The checklist was used by the debriefing facilitators and the evaluator/raters. It was utilized for both the pretest and posttest scenarios. The item by item ratings of the checklist was condensed into a composite score of overall effectiveness.

Sample

Participants. The twenty participants were nursing students seeking a Bachelor's degree in nursing. They have successfully completed Fundamental, Medical/Surgical 1 and Medical/Surgical 2 courses and have completed 16 hours of simulation utilizing a high-fidelity patient simulator under the guidance of nursing faculty instructing in the Bachelor's program. Four of the sixteen hours involved simulation using the i-Stan high-fidelity patient simulator which was used in this study. Sixteen hours of simulation at the southeastern university nursing college where this study was conducted equates to seven different simulation scenarios.

Facilitators and Evaluators. Simulation and debriefing facilitators were graduate nursing students who were trained on the specific simulation scenario and the specific method of debriefing. Two facilitators were trained on the Cerebral Vascular Accident scenario. One of the Cerebral Vascular Accident scenario facilitators was trained on the instructor-led critique of performance

debriefing method and the second facilitator was trained on the LCG debriefing method. The debriefing sessions were recorded in order for the principal investigator to evaluate the facilitators' performance. While reviewing the recordings, the principal investigator used the training guidelines of both methods to evaluate performance. Both facilitators conducted the debriefing sessions according to the specific strategy assigned. Neither facilitator utilized debriefing methods identified in the method not assigned to them.

The two evaluators were graduate nursing students who rated the 40 simulation recordings and evaluated participant performance utilizing a scenario-specific behavioral checklist. As each evaluator viewed the 40 recordings, they were blind to whether the participant in the recording had been exposed to LCG or an instructor-led critique of performance debriefing.

Study Setting

The study was conducted at a southeastern university nursing college simulation center. This center is equipped with high-fidelity human patient simulators (CAE Healthcare i-Stan) and high definition recording (B-Line Medical® SimCapture®).

Sampling Method

Subject Selection, Recruitment and Retention. Inclusion criteria for subject selection: 1.) a Bachelor's degree seeking prelicensure nursing student, 2.) student must have successfully completed Fundamental, Medical/Surgical 1 and Medical/Surgical 2 courses and 3.) student must have completed 16 hours of simulation utilizing a high-fidelity patient simulator under the guidance of nursing faculty instructing in the Bachelor's program. Sixteen hours of simulation at the southeastern university nursing college where this study was conducted equates to seven different simulation scenarios.

The recruitment process included announcement of the study opportunity which was made in the OB/Peds and Leadership courses (these courses are required after successful completion of

the Medical/Surgical 2 course) using the learning management system. Retention was accomplished by informing participants in advance the following: 1.) Participation is scheduled for one day, 2.) Pre-brief information includes review of a Stroke/CVA PowerPoint presentation and a requirement to complete a seven question quiz. Expected time allocation of 30 minutes, 3.) Participation timeline will entail 1.75 – 2 hours and 4.) No other time requirements are necessary.

Diversity of Sample Regarding Gender and Race/Ethnicity. The southeastern university nursing college admits two semesters per academic year. During the Fall semester 120 undergraduate students are admitted and during the Summer semester 108 undergraduate students are admitted. The undergraduate program admission numbers include students who have previously obtained a non-nursing Bachelor's degree. The following data includes information about the population of students from the Summer 2011, Fall 2011, Summer 2012 and Fall 2012 semesters. Admissions for this time period totals 408 with 86% Female, 14% Male, 65% White, 14% Hispanic, 12% Black, 7% Asian/Pacific Islander, 1% American Indian and 2% Unknown.

Procedures

Institutional Review Board approval. Information for the current study was submitted for review to the Institutional Review Board (IRB) and approved (Appendix G and H).

Upon arrival to the simulation center. Participants were given the following forms to complete: informed consent, a short questionnaire to gather demographic data and complete the self-efficacy questionnaire. After baseline measures, the participants were randomly assigned to one of the two debriefing conditions. The participants were escorted to the simulation suite where the simulation scenario took place. The principal investigator familiarized the participants with the high-fidelity patient simulator and other equipment within the room. The simulation experience began after the participant felt adequately familiarized with the room and simulator. The

familiarization process took approximately 5 minutes. The simulation experience was scheduled to last approximately 30 minutes.

Following the simulation experience, participants were escorted out of the simulation suite by the facilitator to the debriefing room. During the debriefing and as part of the debriefing process, the facilitator evaluated the participant's performance using the scenario-specific behavioral checklist.

Participants assigned to the instructor-led critique of performance debriefing. The control condition participants were immediately engaged by the facilitator in the debriefing process. This condition was designed to be highly facilitator led, with the facilitator providing feedback in a straightforward style regarding what was right and wrong about the participant's performance. The participant received the information in a lecture-like format and was not afforded the opportunity to contribute to the analysis of their performance.

The experimental condition, LCG debriefing. This session began with each participant independently completing a self-assessment form. When the participant completed the self-assessment, the debriefing began. The facilitator emphasized the following: asking for the participant's opinions/views of their performance, discussing discrepancies between the facilitator's assessment and the participant's self-assessment, focusing on concrete examples, encouraging the participant to think beyond this scenario and consider the potential impact of future patient care situations, discuss both positive and negative examples, providing behavior based feedback and reinforcing the participant for participating in the debriefing itself.

The debriefing sessions were scheduled to last approximately 30 minutes. Once completed, the participants were given a ten-minute break. After the break, participants repeated the same simulation a second time.

Recording of the simulations, pre-debriefing and post-debriefing, occurred utilizing B-Line Medical® SimCapture® equipment. This equipment allows for simultaneous video and audio recording. Two wide-angle, high definition cameras were placed at a level of 10-feet and were located 4-feet from the foot of the simulated patient's bed. The recordings occurred on the SimCapture laptop connected to the cameras. The laptop screen afforded the evaluator the opportunity to review two camera shots simultaneously.

Once the second recorded simulation experience was completed, the experiment participation was completed. The facilitator escorted the participant out of the simulation suite and thanked them for their participation and time. Participation timeline entailed 1.75 – 2 hours as outlined in Table 1.

Two evaluators (blind to whether the participant in the recording had been exposed to LCG or an instructor-led critique of performance debriefing) reviewed each of the 40 recordings (2 per participant) to evaluate participant performance using a scenario-specific behavioral checklist. The recorded participant performance provided the data for analysis. Performance scores were compared using repeated measures and multi-variant analysis of covariance.

Evaluator training consisted of each evaluator receiving one hour of training on the CVA simulation scenario and the scenario-specific behavioral checklist. The training included identification of the expected critical actions the participants were required to perform in order to successfully provide accurate, timely, evidence-based care. Raters were provided a Behavioral Checklist Rubric (see Appendix I) to assist with achieving agreement in the evaluation of participants. The rubric identified the specific criteria associated with each expected behavior and was divided into performed and not performed categories. Upon completion of the training, the evaluators viewed and rated the 40 recorded mock CVA simulations using the scenario-specific behavioral checklist. In order to evaluate the extent of agreement between the two evaluators, inter-

rater reliability was analyzed using the Kappa statistic to determine consistency among raters. SPSS was used to analyze the Kappa.

Table 1.
Experimental Timeline

Time	Activity
10 minutes	Informed Consent, Confidentiality Agreement Demographic Questionnaire Self-efficacy Questionnaire
5 minutes	Familiarization with the high-fidelity patient simulator and room
30 minutes	Recorded Scenario pre-debrief
5 minutes	Self-assessment (only for LCG group)
15 – 30 minutes	Scenario Debriefing Reactions Survey
10 minutes	Break
30 minutes	Recorded Scenario post-debrief
	Experiment participation completed
1.75 - 2 hours	Total Time

Protection of human subjects. Upon arrival at the experimental site, the participant was greeted by the experimenter and then the participant was given the consent form to sign. The participant was informed that their personal information and performance in the simulation will be kept confidential. Confidentiality will include their performance information/documentation will be de-identified. The participant was informed that their participation in the simulation study would not be graded and would not affect their GPA whether positively or negatively.

Data Analysis

The metrics selected for the study are subjective assessment metrics (i.e. scenario-specific behavioral checklist). Performance was assessed by two independent evaluators. While viewing the recordings, the evaluators made independent assessments of each participant’s performance.

The scenario-specific behavioral checklist consisted of expected actions for the care of individuals with cerebral vascular accidents. The item by item ratings of the checklists were condensed into an overall effectiveness using repeated measures to evaluate the performance scores. Statistical analyses were conducted using SPSS statistical software (IBM SPSS Statistics 22).

The design is a 2 x 2 mixed design (between and within). The between groups factor is condition (LCG vs. an instructor-led critique of performance debrief). The within factor is pre-vs. posttest.

Chapter Summary

This chapter described the method used in the present study, including research design, participants, study materials, and research procedures. The next chapter describes results of the study, including preliminary analyses, hypotheses testing, and supplemental analyses and findings.

CHAPTER FOUR:

FINDINGS

Description of the Sample

A total of 156 students were contacted for recruitment by receiving an announcement in the learning management system at the College of Nursing. The students were in two separate semesters, 96 in Semester Four and 60 in Semester Five, the last semester of the nursing program. The 156 students consisted of individuals who have previously obtained a bachelor's degree that is not in nursing (Second Bachelor's, $n = 30$) as well as students who have not been previously awarded a bachelor's degree (Upper Division, $n = 126$). Sixteen students were male, 140 were female.

Thirty-five students contacted the principal investigator to inquire about the research study participation and received the informed consent to read. After review of the informed consent, twenty-two students agreed to participate. One participant session was selected as the test performance/trial run. This provided the principal investigator the opportunity to run through the computer algorithm in real time and identify areas of improvement. Subsequently the following changes were implemented: 1) The change in the patient's blood pressure to a lower systolic reading was initiated at 1 minute into the hypertensive intervention which involved an order to administer a medication by intravenous push over 2 minutes. The computer generated change in blood pressure takes approximately 2 minutes therefore; initiating the change earlier than originally planned allowed the scenario to progress within the 30 minute allotted timeframe. 2) During the post-aspiration state, the decision was to exclude a second hypertensive crisis. It was found to increase the time in simulation and did not serve to enhance the experience as the participant previously demonstrated

their ability to recognize a hypertensive condition and intervene appropriately. 3) It confirmed the position of the camera on the wall close to the head of the bed provided the required visual perspective. 4) It afforded the principal investigator to recognize the camera position on the opposite side of the room aimed towards the foot of the bed was in need of repositioning. One student was excluded from the study because they were removed from the nursing program prior to their scheduled date of participation.

The final sample of 20 participants, 10 per group, ranged in age from 21 to 43 years ($M = 29.25$; $SD = 7.90$). Of the twenty participants, nineteen were female (95%) and one was male (5%). Sixteen were Semester 4 students (75%) and four were members of Semester 5 (25%). Program Track was fairly equal with 12 Second Bachelor's and 8 Upper Division (Table 1). This sample is representative of the desired target population in regard to age, gender and program track.

All participants had completed 16 hours of simulation utilizing a high-fidelity patient simulator. Four of the sixteen hours involved simulation using the i-Stan high-fidelity patient simulator which was used in this study.

Table 2
Demographic Characteristics

Demographic Characteristics	Control ($n = 10$)	Treatment ($n = 10$)	Pearson Chi-Square		
			Value	df	Asymp.Sig. (2-sided)
Age					
20 – 29	6	6	6.667	10	.756
30 – 39	2	3			
40 - 49	2	1			
Gender					
Female	9	10	1.053	1	.305
Male	1	0			
Level of Nursing School					
4 th Semester	9	7	.267	1	.606
5 th Semester	1	3			
Program Track					
Upper Division	4	4	.202	1	.653
Second Bachelors	6	6			

Chi Square analysis was conducted on the descriptive statistics (Table 1). The frequencies across categories of age, gender, level of nursing school and program track by debriefing strategy were found to be distributed in an equal manner.

Two evaluators/raters (blind to whether the participant in the recording had been exposed to LCG or an instructor-led critique of performance debriefing) reviewed each of the 40 recordings to evaluate participant performance using a scenario-specific behavioral checklist. The extent of inter-rater reliability on their observational report was analyzed using the Kappa statistic. The result was .77 and a value above .70 is conventionally considered as good (Altman, 1991).

The study design is a 2 x 2 mixed design (between and within). The between groups factor is condition (LCG vs. an instructor-led critique of performance debrief). The within factor is pre-vs. post-test. Table 3 summarizes the descriptive statistics related to the groups (between and within). The mean scores for pretest and post-test of both raters were used and evaluated by debriefing strategy.

Table 3
Descriptive Statistics – Between and Within Groups

		Mean	Std. Deviation	N
Pre Rater A & Rater B Mean	Instructor-led critique	10.600	2.3190	10
	LCG	8.950	2.2663	10
	Total	9.775	2.3868	20
Post Rater A & Rater B Mean	Instructor-led critique	23.350	3.7420	10
	LCG	20.550	5.6492	10
	Total	21.950	4.8799	20

An evaluation of the change in performance from pretest to post-test without consideration of the debriefing strategy was conducted. A repeated measures was employed to evaluate whether there were differences in performance between the pretest and post-test. Evaluation of repeated

measures found no assumptions were violated. The Levene's Test of Equality of Error Variances (Table 4) indicates the variances within subjects are equal across groups. The test statistic demonstrated a statistically significant difference between the pretest and post-test at a power $<.001$, (Wilk's $\lambda = .131$, $F(1, 18) = 119.77$, $p = .000$, $\eta_p^2 = .869$).

Table 4
Levene's Test of Equality of Error Variances

	<i>F</i>	<i>df1</i>	<i>df2</i>	<i>Sig.</i>
Pre Rater A & Rater B Mean	.071	1	18	.793
Post Rater A & Rater B Mean	2.732	1	18	.116

Analyses Addressing the Research Questions.

Research question 1. Is there a greater improvement in performance in a simulated clinical encounter following LCG debriefing than with instructor-led debriefing? A repeated measures was conducted to evaluate whether there were differences between the control and treatment groups across the pre and post-test. The test statistic demonstrated no statistical significance between the control and treatment groups, (Wilk's $\lambda = .985$, $F(1, 18) = .267$, $p = .612$, $\eta_p^2 = .015$).

Table 5. Tests of Between-Subjects Effects

Transformed Variable: Average Pre-debrief and Post-debrief

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power ^a
Intercept	10064.756	1	10064.756	635.418	.000	.972	635.418	1.000
STRATEGY	49.506	1	49.506	3.125	.094	.148	3.125	.387
Error	285.113	18	15.840					

a. Computed using alpha = .05

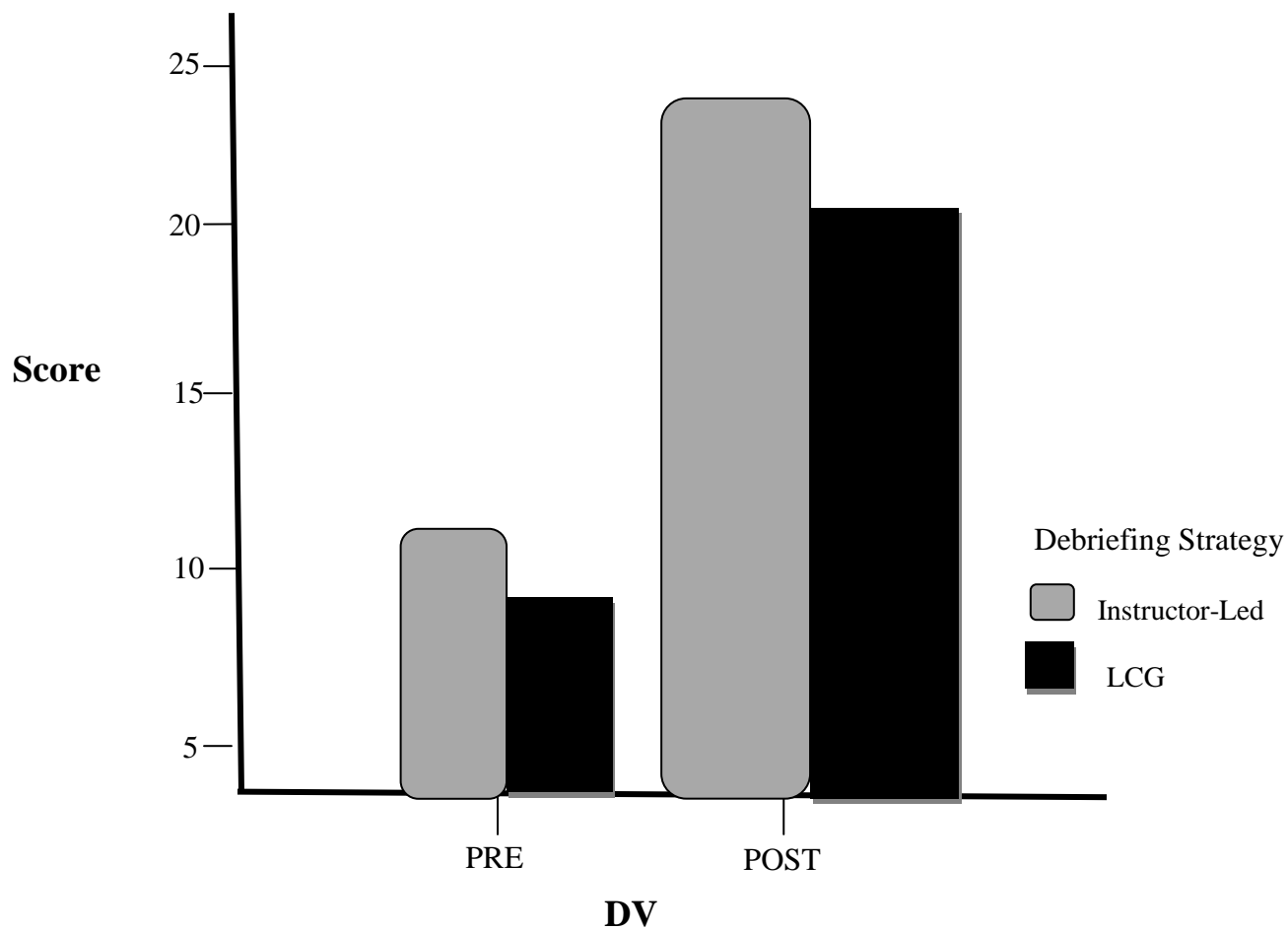


Figure 1. Test of between subjects effects.

An evaluation of the individual expected critical actions the participants were required to perform was conducted to determine if there was a difference in performance by debriefing method. The analysis found no difference in the individual critical actions by debriefing method.

Research question 2. How does change in performance by debriefing method based on self-efficacy at baseline vary? Self-efficacy was not significantly correlated with change in performance by debriefing method ($r = .102, p = .54$).

Table 5.
Correlations

		Self-Efficacy	Post Debrief	Pre Debrief
		Mean	Mean	Mean
Self-Efficacy Mean	Pearson Correlation	1	-.102	.211
	Sig. (2-tailed)		.540	.371
	<i>n</i>	20	20	20
Post Debrief Mean	Pearson Correlation	-.102	1	.255
	Sig. (2-tailed)	.540		.279
	<i>n</i>	20	20	20
Pre Debrief Mean	Pearson Correlation	.211	.255	1
	Sig. (2-tailed)	.371	.279	
	<i>n</i>	20	20	20

Chapter Summary

Chapter four included the results of the descriptive analyses, testing for the two study research questions and additional descriptive analyses. Repeated measures was conducted to address the expected performance improvement regardless of the debriefing strategy as well as research question 1. Pearson correlation was carried out to explore the second research question. Chapter five will discuss the findings presented in the current chapter.

CHAPTER FIVE:

DISCUSSION

Discussion of Findings

An evaluation of the change in performance from pretest to post-test without consideration of the debriefing strategy revealed a statistically significant difference. Since debriefing is where the experience is turned into learning (Thatcher, 1986), any debriefing/feedback, irrespective of the method, is expected to improve performance.

Research question 1. Analysis of the central research question, greater improvement in performance in a simulated clinical encounter following LCG debriefing than with instructor-led debriefing, found no statistical significance. A number of factors contribute to this finding, one of which is the small sample size.

Hays (1994) addressed an investigator's primary purpose. He concluded that the larger the sample size, the more precise the estimation (Hays, 1994). Increasing sample size will allow for a more accurate determination of the "true parameter values" (Hays, 1994). "A major determinant of the power of a test is the number of observations" (Keppel & Wickens, 2004, p. 167). If there is a between group effect in this study, with a small sample size, there is not enough power to detect it if it does exist. Approaches to increase sample size in future studies are addressed in the implications for future research section contained in this chapter.

Given the statistically significant difference in performance from pretest to post-test without consideration of the debriefing strategy, both strategies resulted in knowledge acquisition. Kolb (1984) stated that concrete experience is the basis for observation and reflection. Both groups

participated in an experiential learning activity (concrete) and both engaged in debriefing sessions (observations and reflections). Through the benefit of debriefing, “new implications for action were deduced” without consideration of the debriefing method experienced (Kolb, 1984, p. 21). This is identified in the third stage of learning, formation of abstract concepts and generalizations. These concepts led to “new implications for action that served as guides to create new experiences” (Kolb, 1984, p. 21). Modification of the participant’s behavior, the result of passing through all 4 stages of learning, culminated in performance improvement during the second concrete experience, the post-test simulation.

Research question 2. Self-efficacy was not significantly correlated with change in performance by debriefing method. Participants, who self-reported high self-efficacy, did not demonstrate a greater change in performance than participants who self-reported low self-efficacy. Conversely those who self-reported a low self-efficacy did not necessarily demonstrate poor performance.

Limitations

Sample size. This study was designed with a sample size of 40, alpha level of .05 with the intent to detect a medium effect size. The final sample size was 20. “Power depends on the significance level, the size of the treatment effects and the sample size” (Templin, 2007, p. 17). The small sample size led to insufficient power to detect an effect if one did exist.

Time. One of the greatest limitations adversely affecting sample size was the amount of time available for completion of the study. Waltz, Strickland and Lenz (2005) addressed limitations impacting the attainment of an adequate sample size. “Sample size is, in part, determined by practical considerations such as the time and cost involved” (p. 203). The principal investigator had a research/data gathering time constraint of one semester. This constraint severely limited opportunities for additional data gathering and recruitment of more research participants.

Simulation space. An additional limitation impacting data gathering and recruitment opportunities was the impact of simulation space availability. The southeastern university nursing college simulation center, where this study was conducted, is in great demand. The demand is due to curriculum needs associated with a large number of undergraduate and graduate nursing students. Additional demand is associated with educational requirements of colleges that make up the various health disciplines in this university system. Availability of space and use of the high-fidelity patient simulator is extremely limited.

Behavioral checklist rubrics. Raters were provided a Behavioral Checklist Rubric to assist with achieving agreement in the evaluation of participants. The rubric identified the specific criteria associated with each expected behavior and was divided into performed and not performed categories. The need for the rubric was conceived during the evaluators'/raters' training session. This session occurred one month into the study. Subsequently the facilitators did not have the benefit of this rubric.

Prior exposure to “instructor-led” debriefing. The central concern of this study is based on the lack of consensus on a best practice method for debriefing nursing students following simulation-based training. Because a recognized, standardized method does not exist, various methods are utilized within the discipline. Although instructor-led debriefing is not a bona fide method of debriefing, it is the default method utilized by facilitators who have not been formally trained. Fey (2014) identified that of the 484 accredited prelicensure nursing programs surveyed in the United States, “less than half report that debriefers had any training” to facilitate debriefing (p. 141). Without formal training of simulation facilitators, students are exposed to feedback that does not have a foundation in learner-centered self-assessment.

Conclusions

Clinical experience is a component of nursing education. The demand for clinical placement has exceeded the supply of opportunities. Even in a perfect world where the need for sites equals the available supply; clinical experiences are dependent on the needs of the patient. Clinical faculty cannot guarantee equitable learning experiences and they are unable to ensure learning objectives are met in the clinical environment.

Simulation is the teaching strategy that provides educators with the ability to ensure every student has the same experiential learning opportunity. The Florida Board of Nursing allows Florida nursing institutions of education to replace up to 50% of clinical hours with simulation-based training. In order for this teaching strategy to provide the highest quality of learning, a consensus must be reached on a best practice method for debriefing students following simulation.

Despite the introduction of various debriefing methods, continued research is needed to identify a standardized method within this discipline. The core of the debriefing method must have “active reflection and a learner-centered (not teacher-centered) perspective” (NLN Board of Governors, 2015, p.5).

Implications for Future Research

This study recruited participants over one semester and was limited to a fixed number of potential participants. Data should be gathered over multiple semesters to create the opportunity for a larger sample size by providing adequate opportunity to recruit a greater number of participants. Designing a study that plans for recruitment over multiple semesters has the advantage of increasing the number of potential participants as they meet the inclusion criteria by successfully completing their course of study.

Availability of space and use of the high-fidelity patient simulator was extremely limited. As previously addressed, the greatest limitation was the amount of time available for completion of

the study. Participant recruitment that is conducted over multiple semesters will assist in obtaining a larger sample size while adapting to the limited availability of the simulation center.

Utilization of a computer-generated virtual simulation should be evaluated as a remedy to the limitation of space. Shadow Health®, an educational software developer for nursing and allied health education programs, provides a virtual clinical environment for learning and practicing critical thinking as well as communication and skills. Recent studies have identified that using the Digital Clinical Experience™ (DCE) has resulted in “comprehensive understanding of content, enhanced critical thinking, improved performance and communication skills and improvement in self-efficacy” (Bell, 2015; Gibson-Young, 2014; Kleinheksel, 2014; Mawhirter, & Klainberg, 2014; Randle 2014; Sando, & Whalen, 2014).

The participants of this study received the benefit of an additional experiential learning opportunity. They were able to include this simulated experience on their Curriculum Vitae and had the opportunity to potentially stand out as a future employment candidate because they possess more simulation participation experience. A recommendation would be to include a modest monetary incentive. Given the burdened schedule of a nursing student who must manage classes, clinical experiences, study and many of whom work; the desirable advantages of an additional experiential activity may not sufficiently motivate them to allocate their limited time to participate.

The simulation and debriefing facilitators were graduate nursing students who had no previous instruction or experience as facilitators. The decision to utilize novice facilitators was guided by the desire to eliminate the introduction of previous experience bias, however; the bias of inexperience may have contributed to the results of the study. A recommendation for future research would include utilizing experienced facilitators awarded the Certified Healthcare Simulation Educator (CHSE) designation. This level of certification demonstrates appropriate knowledge of simulation-

based education, an ability to assist learners in self-reflection and an ability to conduct reflective learning experiences that support learning objectives and outcomes.

In this study the control and treatment debriefing facilitators were trained by the principal investigator. Training of the CHSE facilitators by an experienced aviation facilitator on the LCG Debriefing method would be preferable. This training process would be beneficial to insure that the elements specific to the LCG debriefing method are addressed and taught. Having the facilitators trained by experts in the debriefing method would be a measure to ensure that which is being measured, is being evaluated. It is a recommendation to increase test fidelity.

A recommendation for future study is to provide the Behavioral Checklist Rubric to both the facilitators and evaluators/raters in advance of the start of the study. Because the rubric identifies the specific criteria associated with each expected behavior, as it relates to performed and not performed categories, the facilitators will be addressing the participant's performance based on the same criteria the raters will be using to evaluate the same performance. Having both groups of key personnel in possession of the same information will be beneficial in promoting consistency of debriefing and rating.

“Practice and feedback are important for learning” (Ambrose, Bridges, & DiPietro; 2010, p. 124). A more effective design, to evaluate the impact different debriefing methods have on performance, would be to include an additional simulation experience in future studies. “Goal-directed practice coupled with targeted feedback are critical to learning” (Ambrose, Bridges, & DiPietro; 2010, p. 125). Boud and Miller (1996) identified five propositions, upon which learning is based, the first addresses experience as the foundation and stimulus for learning. “Experience cannot be bypassed: it is the central consideration of all learning” (Boud & Miller, 1996, p. 9). This study design included an experience before debriefing (pretest), and an experience following one debriefing session (post-test). Berg and Lundin, (2002) recommend that to evaluate the effect of

practice on learning (permanent) and performance (temporary), is to measure performance at recurring intervals of time. “The most important learning variable is practice itself. Both the amount and quality of practice are important. Greater amounts of practice are associated with superior learning” (Berg & Lundin, 2002, p. 4). Noe (2008) asserted that the frequency of practice influences learning.

Given these constructs, it would be of interest to evaluate performance immediately after the debriefing session and once again at a different interval of time. A second simulation session conducted one week after the initial participation would be beneficial to evaluate if learning occurred. This format could provide a more thorough evaluation of the different debriefing methods as they apply to learning demonstrated by performance improvement.

Prior exposure to instructor-led debriefing was identified as a limitation of this study. Utilizing a participant pool that does not have prior exposure to the control method would be ideal. However; as the central tenet of this study is founded on the lack of consensus on a best practice method for debriefing nursing students, it is feasible to posit that the majority of facilitators have received little or no training on a method of debriefing (Fey, 2014). It is reasonable to conclude that non-trained debriefing facilitators would fall back on the instructor-led method of debriefing rather than engage in a method whose foundation is grounded in learner-centered self-assessment. Therefore; it would be difficult to find potential participants who have not been exposed to the instructor-led method.

Future debriefing studies comparing the LCG Debriefing method to established debriefing methods would eliminate the prior exposure to instructor-led debriefing. This study has underscored the significant amount of time and labor associated with conducting simulation research. The most significant limitation of the present study has been sample size. Designing a future study with one site hosting a comparison of the LCG Debriefing method to all the established debriefing methods recognized in this writing, would take years to accomplish. Engaging

other nursing colleges involved in educating bachelor's degree seeking nursing students in a multi-site research study would significantly shorten the timeframe. Each college could evaluate the LCG Debriefing method in comparison to one of the established debriefing methods. A meta-analysis could then be conducted to synthesis the information provided by the collective research. This study design has the potential of improving the analysis of a best practice method for debriefing.

This study served as a pilot for future research. Implications for the next study include extending the time allotted for gathering data to allow for a larger sample size, utilizing the Certified Healthcare Simulation Educator (CHSE) designees to function as facilitators as well as evaluators and to design the study to evaluate performance immediately after the debriefing session and once again at a different interval of time. A second simulation session conducted one week after the initial participation would be beneficial to evaluate if knowledge acquisition occurred.

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APPENDIX A

SYNTHESIS of RESEARCH

Teaching Strategy: Simulation

Abrahamson, S., Denson, J.S., & Wolf, R.M. (1969). Effectiveness of a simulator in training anesthesia residents. *Journal of Medical Education*, June; 44 (6), 515-519.

Quality of Evidence

Research: Endotracheal intubation proficiency of Anesthesia Residents: Simulation versus Traditional instruction

Subjects: Anesthesia Residents; N = 24 (all 24 completed the study)

Assignment: Convenience sample, Random by coin toss

Measurement: Chart review – no documentation of inter-rater reliability

Findings: Statistical significance in improved proficiency of endotracheal intubation in the experimental group versus the control group

Aronson, BS., Rosa, J.M., Anfinson, J. & Light, N. (1997). A simulated clinical problem-solving experience. *Nurse Educator*, 22 (6), 17-19.

Quality of Evidence

Research: Simulation as a problem-solving method of instruction.

Subjects: Associate Degree Nursing Students; N = 90 (all 90 completed the study)

Assignment: Convenience sample, no control group.

Measurement: Evaluation form, no description of the form documented. No documentation of validity or reliability.

Findings: Positive anecdotal documentation, no statistical data analysis offered.

Weis, P.A., & Guyton-Simmons, J. (1998). A computer simulation for teaching critical thinking skills. *Nurse Educator*, 23 (2), 30-33.

Quality of Evidence

Research: Stimulation of critical thinking with computer simulation

Subjects: Associate Degree Nursing Students; N = 14 (all 14 completed the study)

Assignment: Convenience sample, no control group.

Measurement: Observation– no instrument listed, no documentation of validity or reliability

Findings: Positive anecdotal documentation, no statistical data analysis offered.

APPENDIX A (cont.)

Johnson, J.H., Zerwic, J.J., & Teis, S.L. (1999). Clinical simulation laboratory: an adjunct to clinical teaching. *Nurse Educator*, 24 (5), 37-41.

Quality of Evidence

Research: Stimulation as an enhancement for student learning
Subjects: Senior Nursing Students in their final clinical course; N = not reported
Assignment: Convenience sample, no control group.
Measurement: 6-item, 6-point Likert-type scale, no documentation of validity, reliability, scoring or level of measurement
Subjects also had the opportunity to provide written comments on the evaluation form
Findings: Means and Standard Deviations were reported, no other statistical data analysis documented. Positive anecdotal comments were documented

Rhodes, M.L., & Curran, C. (2005) Use of the human patient simulator to teach clinical judgment skills in a baccalaureate nursing program. *Computers Informatics Nursing*, 23 (5), 256-262.

Quality of Evidence

Research: Students' perception of the simulation experience
Subjects: Baccalaureate Nursing Students; N = 21 (all 21 completed the study)
Assignment: Convenience sample, no control group.
Measurement: 13-item survey developed by the faculty, no documentation of validity, reliability, scoring or level of measurement.
Findings: No statistical data analysis documented, positive anecdotal comments documented.

Gordon, J.A., Shaffer, D.W., Raemer, D.B., Pawlowski, J., Hurford, W.E., & Cooper, J.B. (2006). A randomized controlled trial of simulation-based teaching versus traditional instruction in medicine: a pilot study among clinical medical students. *Advances in Health Sciences Education: Theory and Practice*, 11 (1), 33-39.

Quality of Evidence

Research: Comparison of simulation to didactic instruction
Subjects: Third and Fourth Year Medical Students; N = 38 (all 38 completed the study)
Assignment: Convenience sample, randomized to experimental or control group.
Measurement: 11 or 12-item short-answer/multi-part question pre and post-test, maximum score of 100. No documentation of validity, reliability or level of measurement Data analyzed by analysis of covariance.
Findings: No statistical significant difference between simulation and didactic

APPENDIX A (cont.)

Schoening, A. M., Sittner, B. J., & Todd, M. J. (2006). Simulated clinical experience: nursing students' perceptions and the educators' role. *Nurse Educator*, 31(6), 253-258.

Quality of Evidence

- Research: Examination of students' perceptions of a preterm labor simulated clinical experience as a method of instruction.
- Subjects: Junior Year Baccalaureate Nursing Students; N = 60 (all 60 completed the study)
- Assignment: Convenience sample, no control group.
- Measurement: 4-point Likert-type scale, no documentation of reliability. Content validity of instrument documented as accomplished by 2 experts not by the standard 5 to 7 experts.
- Findings: No statistical data analysis documented, positive anecdotal comments documented.

Bremner, M.N., Aduddell, K., Bennett, D.N. & VanGeest, J.B. (2006). The use of human patient simulators: best practices with novice nursing students. *Nurse Educator*, 31(4), 170-174.

Quality of Evidence

- Research: Determination of the value of human patient simulation technology as an educational methodology.
- Subjects: Baccalaureate Nursing Students; N = 56 (41 completed the study, no data associated with the 15 non-completing students was documented)
- Assignment: Convenience sample, no control group.
- Measurement: 2-part self-report questionnaire: Part 1: Likert-type scale with no documentation of scoring or level of measurement, no documentation of validity or reliability. Part 2: Subjects also had the opportunity to provide written comments.
- Findings: Data analysis consisted of documenting the percentage of students who answered a certain way. No statistical analysis or significance documented. Positive anecdotal comments documented.

APPENDIX A (cont.)

Parr, M.B., & Sweeney, N.M. (2006). Use of human patient simulation in an undergraduate critical care course. *Critical Care Nursing Quarterly*, 29(3), 188-198.

Quality of Evidence

- Research: Assessment of the simulation as a process for the development of necessary patient care, decision-making and critical thinking skills.
- Subjects: Final Semester Baccalaureate Nursing Students; N = 21 (17 completed the study, no data associated with the 4 non-completing students was documented)
- Assignment: Convenience sample, no control group.
- Measurement: 6-item, 5-point Likert-type scale followed by 1 open-ended suggestion item. No documentation of validity or reliability of instrument.
- Findings: Mean scores were reported for each item, no further data analysis documented. Positive anecdotal comments documented.

Scherer, Y.K., Bruce, S. A., & Runkawatt, V. (2007). A comparison of clinical simulation and case study presentation on nurse practitioner students' knowledge and confidence in managing a cardiac event. *The Berkeley Electronic Press*, 4 (1), 1-14.

Quality of Evidence

- Research: Comparing the efficacy of controlled simulation assisted learning and case study presentation on knowledge and confidence of nurse practitioner students in managing a cardiac event.
- Subjects: Nurse Practitioner Students; N = 23 (all 23 completed the study)
- Assignment: Convenience sample, random assignment: Experimental group N = 13, Control group N = 10.
- Measurement: 3 instruments were used: 1) Knowledge Quiz, 15 points = perfect score, 2) Confidence Scale, 10-item, 4-point Likert-type scale; a higher score indicates greater confidence, 3) Evaluation Instrument, 6-item, 3-point Likert-type scale; higher score indicates greater satisfaction with overall experience. Statistical analyses were performed using SPSS 14.0.
- Findings: No documentation of validity or reliability of instrument.
No statistically significant differences in knowledge test scores.
Confidence scores in the control group were higher than the experimental group. Both groups rated the experience highly and there were no statistically significant differences.

APPENDIX B

DEMOGRAPHIC QUESTIONNAIRE

Gender:

F M Other **Age:** _____

Level of Nursing School: _____ 4th Semester _____ 5th Semester

Program Track: _____ Upper Division _____ Second Bachelors

Previous simulation experiences: *Circle ones you have completed*

- | | | |
|--------------------------|----------|---------------------------------|
| 1. DKA | 2. COPD | 3. Post-Cardiac Cath Chest Pain |
| 4. Anaphylactic Reaction | 5. Neuro | 6. GI Bleed 7. Mock Code |

Number of previous simulation experiences using i-Stan simulator: *Circle ones you have completed*

- | | |
|--------|--------------------------|
| 1. DKA | 2. Anaphylactic Reaction |
|--------|--------------------------|

APPENDIX C

SELF-EFFICACY QUESTIONNAIRE

	To no Extent				To a Great Extent
1. I have confidence in my abilities to care for high acuity patients	1	2	3	4	5
2. I believe I can become unusually good at caring for high acuity patients	1	2	3	4	5
3. I expect to be known as a high-performing nurse	1	2	3	4	5
4. I feel I can solve any problem I encounter during patient care	1	2	3	4	5
5. I can accomplish a lot in the unit/floor when I work hard	1	2	3	4	5
6. No patient situation is too tough for me	1	2	3	4	5
7. I expect to have a lot of influence on other nurses	1	2	3	4	5
8. I feel I can be a very productive nurse	1	2	3	4	5

Modified from Blickensderfer, E. & Jennison, J. (2006). FY2005 FITS instructor education research report 4: Empirical investigation of the Learner Centered Grading debriefing approach.

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APPENDIX D
SELF-ASSESSMENT - CEREBRAL VASCULAR ACCIDENT
(LCG participant only)

Directions: Please rate your own performance on the following items as honestly as possible.

State #1 – Initial Assessment

Did you approach the patient from the left side?	Yes / No/ Had difficulties
Did you complete initial assessment?	Yes / No/ Had difficulties
Did you administer oxygen via nasal cannula at 2LPM?	Yes / No/ Had difficulties
Did you administer Labetalol using the 5 medication rights?	Yes / No/ Had difficulties
Did you assess urinary output?	Yes / No/ Had difficulties
Did you instruct the patient and granddaughter on NPO status?	Yes / No/ Had difficulties
Did you place both side rails up for patient’s safety?	Yes / No/ Had difficulties
Did you place call light, phone, bedside table, etc. to patient’s left side?	Yes / No/ Had difficulties
Did you remove water pitcher and cups from room?	Yes / No/ Had difficulties
Did you obtain CT brain results?	Yes / No/ Had difficulties
Did you report CT brain results to provider?	Yes / No/ Had difficulties
Did you read back all results and/or orders?	Yes / No/ Had difficulties

State #2 – Post Aspiration

Did you increase oxygen to maintain SpO2 greater than 92%?	Yes / No/ Had difficulties
Did you elevate the head of the bed to at least 30 degrees?	Yes / No/ Had difficulties
Did you call the provider to report possible aspiration?	Yes / No/ Had difficulties
Did you read back provider’s telephone orders?	Yes / No/ Had difficulties
Did you notify radiology to perform a STAT Chest x-ray?	Yes / No/ Had difficulties
Did you notify provider of STAT Chest x-ray results?	Yes / No/ Had difficulties
Did you check compatibility of Heparin & Levofloxacin?	Yes / No/ Had difficulties
Did you administer Heparin & Levofloxacin in different sites?	Yes / No/ Had difficulties
Did you administer all medications following the 5 rights?	Yes / No/ Had difficulties
Did you administer Levofloxacin according to orders?	Yes / No/ Had difficulties
Did you administer Heparin IVP according to orders?	Yes / No/ Had difficulties
Did you administer Heparin IV infusion according to orders?	Yes / No/ Had difficulties
Did you increase the rate of IV fluids to 75mL/hr?	Yes / No/ Had difficulties
Did you notify Speech Therapy of consult?	Yes / No/ Had difficulties
Did you give a thorough report to Neuro Medical/Surgical unit?	Yes / No/ Had difficulties

APPENDIX E
CEREBRAL VASCULAR ACCIDENT SCENARIO

Synopsis:

This simulated clinical experience presents the learner with a 78-year-old female, who presents to the Emergency Department (ED) with right-sided weakness. Upon arrival it was noted that she has right facial and eye drooping with loss of right visual fields in both eyes and left upper extremity hemiplegia. The time elapsed since signs and symptoms of stroke presented and arrival to the ED has been one hour and 20 minutes. The computerized tomography scan is negative for hemorrhagic stroke. Thrombolytics are not indicated as the patient has been on Warfarin for a past medical history of atrial fibrillation. She will begin heparin therapy requiring titration. She aspirates when given water by her granddaughter and requires reorientation to her hospital room due to her visual field deficits.

ECS® Program for Nursing Curriculum Integration (PNCI™) **Cerebral Vascular Accident 3**©
2007 METI, Sarasota, FL; Authors: Brenda Beyer and Kathy Curtis, Mount Carmel College of
ursing.v.3 June 2007

Cerebral Vascular Accident Scenario APPENDIX E (cont.)

Scenario States			
State	Events	Minimal Behaviors Expected	Prompts, Questions, and Teaching Points
<p>State #1: Initial Assessment</p>	<p>BP=210/120; RR=18; SpO₂ 89%; Heart Rhythm=Atrial fi brillation; Breath Sounds=Clear; Awake, alert; Pupils equal; Bowel Sounds=Normoactive; Urine Output=None; Repeatedly complains of thirst with slurred but understandable speech; Temp=37.3°C <i>Tell learners when they inquire:</i> Pupils reactive to light; Abdomen soft, flat; Bladder nondistended; Grip strong on right, no grasp on left; Able to lift both legs slightly off bed; Decreased sensation left upper extremity; Skin warm, dry</p>	<p>___ Approaches patient from the left side due to loss of right visual fields ___ Completes initial assessment ___ Calculates Glasgow Coma Scale (total = 11) ___ Administers oxygen via nasal cannula at 2LPM ___ Administers Labetalol using the 5 medication rights ___ Assesses urinary output ___ Instructs patient and granddaughter on NPO status ___ Places both side rails up for patient's safety ___ Places call light, phone, bedside table, etc. to patient's left side ___ Removes water pitcher and cups from room ___ Obtains lab results and CT brain results and reads back results</p>	<p>How should the nurse prioritize the assessment of this patient? • <i>Airway</i> • <i>Breathing</i> • <i>Circulation</i> • <i>Neurologic</i> What pathological process does the nurse suspect is occurring in this patient? Why? • <i>Cerebral vascular accident</i> • <i>Slurred speech, facial drooping, hemiplegia, and decreased visual fi elds</i> How does the medical history contribute to her increased risk for CVA? • <i>Atrial fi brillation, coronary artery disease, hypertension, and hyperlipidemia are all risk factors</i> • <i>TIA history indicates that high risk is present</i> What preventative interventions should be taken to reduce the risk of developing further complications? • <i>Keep patient NPO</i> • <i>Elevate head of bed</i> • <i>Turn to unaffected side if drooling</i> • <i>Reposition frequently</i> • <i>Passive and active range of motion</i> What actions can the nurse take to prevent startling a patient with visual fi eld loss? • <i>Approach patient from the side that they can see</i> • <i>Talk to patient when moving to other side of bed or out of visual fi eld range</i> Why is it important to repeat any order given by the healthcare provider? • <i>To ensure order heard accurately</i></p>

Scenario States			
State	Events	Minimal Behaviors Expected	Prompts, Questions, and Teaching Points
State #2: Post Aspiration	HR=112; BP=172/100; RR=36; SpO ₂ =86% on 2LPM; Breath Sounds=Rales; Coughing; Alert, anxious <i>Tell learners when they inquire:</i> Capillary refi ll 3 seconds	___ Increases oxygen to maintain SpO ₂ greater than 92% ___ Elevates the head of the bed to at least 30 degrees ___ Calls provider to report possible aspiration and test results ___ Receives new orders and reads back orders ___ Notifies radiology for STAT portable Chest x-ray ___ Administers medications following the 5 rights ___ Levofloxacin IVPB ___ Pantoprazole IVP ___ Heparin IVP ___ Heparin IV continuous infusion ___ Checks compatibility of Heparin, Levofloxacin and Pantoprazole ___ Starts second line for Heparin infusion ___ Increases rate of IV fluids ___ Inserts nasogastric tube and assesses placement	What collaborative consult might be helpful for swallowing evaluation? • <i>Speech therapy</i> What test may be ordered to further evaluate swallowing ability? • <i>Swallow study</i> Why is it necessary to reassess oxygenation after suctioning? • <i>Suctioning decreases saturation</i> What do the findings of the lab and diagnostic test results indicate thus far? • <i>Anemia</i> • <i>Hyponatremia</i> • <i>Hypochloremia</i> • <i>No evidence of hemorrhagic CVA</i>

APPENDIX F

CEREBRAL VASCULAR ACCIDENT SCENARIO BEHAVIORAL CHECKLIST (Facilitator & Evaluator to Complete)

State #1 – Initial Assessment

- ___ Approaches patient from the left side due to loss of right visual fields
- ___ Completes initial assessment
- ___ Administers oxygen via nasal cannula at 2LPM
- ___ Administers Labetalol using the 5 medication rights
- ___ Assesses urinary output
- ___ Instructs patient and granddaughter on NPO status
- ___ Places both side rails up for patient's safety
- ___ Places call light, phone, bedside table, etc. to patient's left side
- ___ Removes water pitcher and cups from room
- ___ Obtains CT brain results – (*negative for hemorrhagic stroke*)
- ___ Reports CT brain results to the provider (*May be done in State #2*)
- ___ Reads back any orders or test results given by healthcare provider(s) to assure accuracy

State #2 – Post Aspiration

- ___ Increases oxygen to maintain SpO₂ greater than 92% (*up to 6L NC as needed*)
- ___ Elevates the head of the bed to at least 30 degrees
- ___ Calls provider to report possible aspiration
- ___ Reads back new orders
- ___ Notifies radiology for STAT portable Chest x-ray
- ___ Notifies provider of Stat CXR results – (*aspiration pneumonia*)
- ___ Checks compatibility of Heparin and Levofloxacin
- ___ Administers Heparin IVP in the IV site opposite of Levofloxacin due to medication incompatibility
- ___ Administers medications following the 5 rights:
 - ___ Levofloxacin IVPB administered according to orders
 - ___ Heparin IVP administered according to orders
 - ___ Heparin IV infusion administered according to orders
- ___ Increases rate of IV fluids to 75mL/hr
- ___ Notifies Speech Therapy of consult
- ___ Gives thorough report to Neuro Medical/Surgical unit prior to transfer

APPENDIX G
INFORMED CONSENT



Informed Consent to Participate in Research Involving Minimal Risk
Information to Consider Before Taking Part in this Research Study

IRB Study # Pro00015102

You are being asked to take part in a research study. Research studies include only people who choose to take part. This document is called an informed consent form. Please read this information carefully and take your time making your decision. Ask the researcher or study staff to discuss this consent form with you, please ask him/her to explain any words or information you do not clearly understand. The nature of the study, risks, inconveniences, discomforts, and other important information about the study are listed below.

We are asking you to take part in a research study called:

[A Comparative Evaluation of The Learner Centered Grading Debriefing Method in Nursing Education]

The person who is in charge of this research study is Marisa Belote. This person is called the Principal Investigator. However, other research staff may be involved and can act on behalf of the person in charge. She is being guided in this research by Dr. John Clochesy.

The research will be conducted at the University Of South Florida College Of Nursing.

This research is being sponsored by Sigma Theta Tau International.

Purpose of the study

The purpose of this research is to examine the LCG debriefing approach as an instrument for the nursing faculty and the learner to assess the learner's performance. You will be asked to participate in a simulation scenario. This scenario topic is new to you and is not offered as part

of your educational experience or program. The study is being conducted for a dissertation; a doctoral student is conducting the study.

Why are you being asked to take part?

We are asking you to take part in this research study because you are 1.) a Bachelor's degree seeking nursing student, 2.) you have successfully completed Fundamental, Medical/Surgical 1 and Medical/Surgical 2 courses and 3.) you have completed 16 hours of simulation utilizing a high-fidelity patient simulator under the guidance of nursing faculty instructing in the Bachelor's program.

Study Procedures: What will happen during this study?

If you take part in this study, you will be asked to: 1.) Read the educational information that will be given in advance of the study in order to prepare/pre-brief for the simulation experience as well as answer the 7 question quiz located in the learning management system. Pre-brief time requirement is approximately 20 - 30 minutes.

2.) Spend approximately 190 to 200 minutes in this study all on the same day. No other time is required. This study includes participation in three simulation experiences, which are approximately 30 minutes each, as well as two debriefing sessions lasting approximately 30 minutes each.

Form Completion: Before the simulation experience you will be asked to complete a demographic questionnaire and a self-efficacy questionnaire. After each simulation experience is completed, you may be asked to complete a self-assessment questionnaire. After the debriefing experience you will be asked to complete a reactions survey. You will receive two 10-minute breaks, one immediately after the first debriefing session and the other immediately after the second debriefing session.

A study visit is with the person in charge of the study or study staff. You will need to come for one study visit in all. Most study visits will take about 190 to 200 minutes. Some study visits may be shorter some may be a little longer. All simulation participation will occur on one day. No other simulation time is required.

Prior to arrival to the study, you will need to read the pre-brief article and answer the 7 question quiz located in the learning management system.

Study Visit Timetable:

Time	Activity
10 minutes	Informed consent, Confidentiality Agreement Demographics Self-efficacy questionnaire
5 minutes	Familiarization with the high-fidelity patient simulator and room
5 minutes	Outside patient room, participant receives Nursing Handoff Report. Review and familiarization with the information.
30 minutes	Recorded 1 st Scenario pre-debrief
5 minutes	Self-assessment questionnaire

30 minutes	Recorded 1 st Scenario Debriefing Reactions Survey
10 minutes	Break
30 minutes	Recorded 2 nd Scenario post-debrief, same scenario as 1 st
5 minutes	Self-assessment questionnaire
30 minutes	Recorded 2 nd Scenario Debriefing Reactions Survey
10 minutes	Break
30 minutes	Recorded 3 rd Scenario post-debrief, same scenario as 1 st and 2 nd
	Experiment participation completed
190 - 200 minutes	Total Time

At the visit, you will be asked to:

Participate in three simulation experiences and two debriefing experiences.

- You will be asked to complete this informed consent.
- You will be asked to sign a confidentiality agreement. This agreement will require you to refrain from disclosing any aspect of your participation in order to insure all participants will enter the study at the same level of knowledge and understanding. Any information relayed to future participants, facilitators or evaluators has the potential to negatively impact the analysis of data.
- You will be asked to complete a Demographics Questionnaire. The questionnaire consists of variables that will be collected for descriptive purposes.
- You will be asked to complete a Self-efficacy Questionnaire. The questionnaire consists of questions regarding your self-efficacy for working with acutely ill patients in an acute care setting.
- You may be asked to complete a Self-assessment Questionnaire. This questionnaire consists of questions regarding the scenario events.
- You will be asked to complete a Reactions Survey. The survey consists of questions regarding your experience in the debriefing session.
- Each of the simulation and debriefing sessions will be recorded. Only individuals involved in the study will have access to view the recording. The following processes will be implemented in order to protect your identity:
 1. All performance information /documentation will be de-identified.
 2. During the simulation experience, you will identify yourself as the “nurse” and will instruct the simulated patient to call you by the “nurse” rather than provide your real name.
 3. Data will be kept in the locked filing cabinet in the locked office of the PI and all electronic study data will be password protected with access restricted to approved study personnel.
 4. All recordings will be downloaded to a flash drive or other appropriate technology and will be kept in the principal investigator’s (PI) locked office in a locked cabinet. The recording will be deleted from the B-Line Medical® SimCapture® equipment at the end of every study

session to insure that individuals, not involved in the research study, will be unable to access or view the recordings.

5. All data and recordings will be destroyed after five years or after such time as independent rater evaluation is completed whichever is longer. The destruction process for recordings recommended by the University Of South Florida Research Integrity & Compliance will be implemented.

This study consists of a control group and a treatment group. The difference between the groups is determined by the two debriefing methods to be used. Once you agree to voluntarily participate in the study, you will be randomly assigned to one of the groups. You will not be informed of the group you have been randomly assigned in order to prevent performance bias.

Total Number of Participants

About 40 individuals will take part in this study at USF.

Alternatives / Voluntary Participation / Withdrawal

You do not have to participate in this research study.

You should only take part in this study if you want to volunteer. You should not feel that there is any pressure to take part in the study. You are free to participate in this research or withdraw at any time. There will be no penalty or loss of benefits you are entitled to receive if you stop taking part in this study. The decision to participate or not to participate will not affect your student status, the study will not be graded and participation will not affect your GPA whether positively or negatively.

Benefits

The potential benefits of participating in this research study include:

1. The scenario topic has been chosen because of its prevalence and high acuity which requires accurate, timely nursing intervention and because exposure to this simulation is experientially advantageous pre-licensure.
2. The simulation scenario is not included in the present curriculum and you will have the benefit of an additional experiential learning opportunity.
3. The inclusion of this simulated experience on your Curriculum Vitae/Resume is an additional benefit not afforded to individuals who are not participants in this study.
4. Because of this additional Curriculum Vitae/Resume inclusion, you will potentially stand out as a future employment candidate.

Risks or Discomfort

The following risks may occur:

- There are no physical risks to the participant posed by this study. Loss of confidentiality and/or loss of privacy are the main risks to study participation.

Compensation

You will receive no payment or other compensation for taking part in this study.

Privacy and Confidentiality

We will keep your study records private and confidential. Certain people may need to see your study records. By law, anyone who looks at your records must keep them completely confidential. The only people who will be allowed to see these records are:

- The research team, including the Principal Investigator, study coordinator, and all other research staff.
- Certain government and university people who need to know more about the study. For example, individuals who provide oversight on this study may need to look at your records. This is done to make sure that we are doing the study in the right way. They also need to make sure that we are protecting your rights and your safety.
- Any agency of the federal, state, or local government that regulates this research. This includes the Department of Health and Human Services (DHHS) and the Office for Human Research Protection (OHRP).
- The USF Institutional Review Board (IRB) and its related staff, who have oversight responsibilities for this study, staff in the USF Office of Research and Innovation, USF Division of Research Integrity and Compliance, and other USF offices who oversee this research.
- The sponsors of this study (Sigma Theta Tau International) and contract research organization.

We may publish what we learn from this study. If we do, we will not include your name. We will not publish anything that would let people know who you are.

You can get the answers to your questions, concerns, or complaints

If you have any questions, concerns or complaints about this study, or experience an unanticipated problem, call Marisa Belote at 813-974-5331.

If you have questions about your rights as a participant in this study, general questions, or have complaints, concerns or issues you want to discuss with someone outside the research, call the USF IRB at (813) 974-5638.

Consent to Take Part in this Research Study

It is up to you to decide whether you want to take part in this study. If you want to take part, please sign the form, if the following statements are true.

I freely give my consent to take part in this study. I understand that by signing this form I am agreeing to take part in research. I have received a copy of this form to take with me.

Signature of Person Taking Part in Study

Date

Printed Name of Person Taking Part in Study

Statement of Person Obtaining Informed Consent

I have carefully explained to the person taking part in the study what he or she can expect from their participation. I hereby certify that when this person signs this form, to the best of my knowledge, he/ she understands:

- What the study is about;
- What procedures will be used;
- What the potential benefits might be; and
- What the known risks might be.

I can confirm that this research subject speaks the language that was used to explain this research and is receiving an informed consent form in the appropriate language. Additionally, this subject reads well enough to understand this document or, if not, this person is able to hear and understand when the form is read to him or her. This subject does not have a medical/psychological problem that would compromise comprehension and therefore make it hard to understand what is being explained and can, therefore, give legally effective informed consent.

Signature of Person obtaining Informed Consent

Date

Printed Name of Person Obtaining Informed Consent

APPENDIX H
IRB APPROVAL



October 8, 2014

Marisa Belote College of Nursing
12901 Bruce B. Downs Boulevard
Tampa, FL 33612

RE: **Expedited Approval for Initial Review**

IRB#: Pro00015102

Title: A Comparative Evaluation of The Learner Centered Grading Debriefing Method
in Nursing Education

Study Approval Period: 10/8/2014 to 10/8/2015

Dear Ms. Belote:

On 10/8/2014, the Institutional Review Board (IRB) reviewed and **APPROVED** the above application and all documents outlined below.

Approved Item(s):

Protocol Document(s):

[Study Protocol -Pro00015102 - Oct 1, 2014 - Version 2.doc](#)

Consent/Assent Document(s)*:

[Social-Behavioral Adult Informed Consent - Version 1 - October 1, 2014.docx.pdf](#)

*Please use only the official IRB stamped informed consent/assent document(s) found under the

"Attachments" tab. Please note, these consent/assent document(s) are only valid during the approval period indicated at the top of the form(s).

It was the determination of the IRB that your study qualified for expedited review which includes activities that (1) present no more than minimal risk to human subjects, and (2) involve only procedures listed in one or more of the categories outlined below. The IRB may review research through the expedited review procedure authorized by 45CFR46.110 and 21 CFR

56.110. The research proposed in this study is categorized under the following expedited review category:

(6) Collection of data from voice, video, digital, or image recordings made for research purposes.

(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

As the principal investigator of this study, it is your responsibility to conduct this study in accordance with IRB policies and procedures and as approved by the IRB. Any changes to the approved research must be submitted to the IRB for review and approval by an amendment.

We appreciate your dedication to the ethical conduct of human subject research at the University of South Florida and your continued commitment to human research protections. If you have any questions regarding this matter, please call 813-974-5638.

Sincerely,

A handwritten signature in cursive script that reads "John A. Schinka, Ph.D.".

John Schinka, Ph.D., Chairperson
USF Institutional Review Board

APPENDIX I

BEHAVIORAL CHECKLIST RUBRIC

	Behavior	Performed = 1	Not Performed = 0
1	Left Patient Approach	Intentional left approach anytime in simulation because of right visual field loss & to prevent startling of patient. <i>(will have to approach right side because of IV access but informs patient they are going to her right thereby preventing startle response)</i>	Approaching left side because of convenience without regard of visual field loss <i>(does not inform patient they are going to her right thereby causing startle response)</i>
2	Initial Assessment	Neuro assessment is done	No Assessment or assessment without any neuro evaluation
3	O ₂ Administration	Apply O ₂ apparatus & voice # of liters	No application of O ₂ apparatus
4	Labetalol Administration	Draws up 4mL & administer over 2 minutes	Not given, does not draw up 4mL or administers it in less than 2 minutes
5	Assess Urine Output	Look at Foley content <i>(does not need to voice or document amount)</i>	Foley content not evaluated
6	NPO Instructions	Informs patient & granddaughter about NPO status	Does not inform patient & granddaughter about NPO status
7	Side rails Up	Places left side rail up	Does not place left side rail up
8	Bedside table, etc. moved to patient's left	Call light & bedside table are moved to the left side of the bed. <i>(may identify as performed if they voice they would move the call light)</i>	Call light and/or bedside table not moved to the left side of the bed <i>(or not voiced that they would move the call light)</i>
9	Removes H ₂ O	Water pitcher & drinking glass removed from the bedside table to the counter	Water pitcher & drinking glass not removed from the bedside table to the counter
10	Obtains CT results	Calls CT to obtain STAT brain scan result	Does not call CT for scan results
11	Reports CT results	Calls doctor to report CT results	Does not call doctor to report CT results
12	Reads Back	Reads back any results and new orders	Does not read back any or only some results & new orders
		Post Aspiration	
13	Increase O ₂	Increases liters based on decreased SpO ₂	Does not increase liters with decreased SpO ₂
14	Elevates HOB	Elevates HOB to at least 30degrees	Does not elevate HOB at all or does not elevate to at least 30 degrees

15	Calls provider r/o aspiration	Recognizes potential aspiration has occurred & contacts doctor	Does not recognize potential aspiration has occurred & fails to contact doctor
16	Reads Back	Reads back new orders	Does not read back new orders
17	Calls for STAT CxR	Calls for STAT portable CXR	NO call for STAT portable CxR
	Behavior	Performed = 1	Not Performed = 0
18	Notifies Provider of CxR results	Calls doctor to report CXR results	Does not call doctor to report CxR results
19	Checks medication compatibility	Checks compatibility of Heparin & Levofloxacin & Labetalol if being given during same time period	Does not check compatibility of Heparin & Levofloxacin & Labetalol if being given during same time period
20	Administers med in separate sites	Heparin & Levofloxacin are incompatible and are not administer in the same IV site. Labetalol is compatible with both drugs.	Administers Heparin & Levofloxacin in the same site.
21	Administers med with Patient identification	Identifies right patient for Labetalol, Heparin & Levofloxacin	Does not identify patient for any medication or identifies patient for some of the medications.
22	Levofloxacin IVP	Pump rate is set to 100mL/hr	Not given, Pump rate is not set to 100mL/hr
23	Heparin IVP	Draws up 6mL & administers over 1 minute	Not given, does not draw up 6mL or administers it in less than 1 minute
24	Heparin IV continuous infusion	Pump rate is set to 22mL/hr or 2322mL/hr	Not given, Pump rate is not set to 22mL/hr or 2322mL/hr
25	Increases rate of IV	Pump rate is set to 75mL/hr	Pump rate is not set to 75mL/hr
26	Notifies Speech Therapy consult	Calls Speech Therapy for consult	Does not call Speech Therapy for consult
27	Report to Neuro unit	Gives thorough report by addressing all the events pertaining to the patient's condition & care <i>(Based on participant's scenario)</i>	Fails to include in report all the events pertaining to the patient's condition & care <i>(Based on participant's scenario)</i>

ABOUT THE AUTHOR

Marisa J. Belote received a Bachelor of Science in Nursing from the University of Florida, Gainesville, Florida and a Master of Business Administration from the University of South Florida, Tampa, Florida. Her clinical experience includes specializing in trauma/emergency care. After obtaining her paramedic license, she became a flight nurse. Following graduation with an MBA, she worked for Critikon, Inc., A Johnson & Johnson Company, Tampa, Florida as the National Director of Sales Support and Clinical Sales Training Coordinator.

Mrs. Belote is the Director of the Virtual Simulation Center of Excellence and Clinical Education at the University of South Florida College of Nursing. Her teaching and research interests continue to be focused on simulation and debriefing facilitation.