

BACCALAUREATE NURSING STUDENTS' PERCEPTIONS  
OF CLINICAL JUDGMENT AND SELF-EFFICACY  
FOLLOWING HIGH-FIDELITY SIMULATION

by

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## ABSTRACT

Nurse education literature reflects that educators face a problem of how to provide meaningful clinical learning experiences that help undergraduate nursing students develop clinical judgment and increase self-efficacy. Many schools of nursing are incorporating high-fidelity simulation as an alternative clinical teaching strategy, yet there is little quantitative evidence to support the effectiveness of this teaching method in undergraduate nursing education, particularly regarding the development of clinical judgment. The purpose of this quasi-experimental time series design study was to explore the effectiveness of using multiple high-fidelity simulation experiences to increase perceptions of clinical judgment and self-efficacy in senior level baccalaureate nursing students. Self-report data was collected following three different high-fidelity simulation experiences at three points in time. . Data analysis revealed a statistically significant increase ( $p = .041$ ) in students' perceptions of clinical judgment occurred between Time 1 and Time 3. Students' perceptions of self-efficacy also increased significantly from Time 1 and Time 3 ( $p = .003$ ) and from Time 2 and Time 3 ( $p = .001$ ). Regression analysis revealed a slight positive correlation ( $\text{sig.} = .003$ ) between students' perceptions of self-efficacy and clinical judgment.

## DEDICATION

“There are obviously two educations. One should teach us how to make a living,  
and the other how to live.”

James Truslow Adams

This dissertation is dedicated to my husband and children, because they are three of my greatest teachers. To my husband, Dan, I want to thank you for every moment we have shared. My life with you has been a marvelous journey filled with great lessons of love, encouragement, and acceptance. To my children, Elizabeth and Nick, you inspire me to be the best mother and teacher I can be. I hope and pray that you too will strive to become all that you can be.

## LIST OF ABBREVIATIONS OR SYMBOLS

|           |  |
|-----------|--|
| BSN       | Bachelor of Science in Nursing                           |
| CINHAL    | Cumulative Index of Nursing and Allied Health Literature |
| CJ        | Clinical Judgment  |
| <i>df</i> | Degrees of freedom                                       |
| GPA       | Grade point average                                      |
| HFS       | High fidelity simulation                                 |
| IOM       | Institute of Medicine                                    |
| IRB       | Internal Review Board                                    |
| LCJR      | Lasater Clinical Judgment Rubric                         |
| LSSCL     | Learner Satisfaction and Self-Confidence in Learning     |
| METI      | Medical Education Technology Incorporated                |
| <i>n</i>  | number in sample   |
| NESF      | Nursing Education Simulation Framework                   |
| NLN       | National League for Nursing                              |
| <i>p</i>  | Probability value  |
| PNCI      | Program for Nursing Curriculum Integration               |
| $R^2$     | Squared multiple correlation coefficient                 |
| RM ANOVA  | Repeated measures of analysis of variance                |
| RN-BSN    | Registered Nurse to Bachelor in Nursing                  |

|      |   |
|------|---|
| SE   | Self-efficacy                               |
| sig. | Significance                                |
| SPSS | Statistical Package for the Social Sciences |
| Std. | Standard                                    |
| UNA  | University of North Alabama                 |
| =    | Equal to                                    |
| %    | Percentage                                  |
| <    | Less than                                   |

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## CHAPTER I

### INTRODUCTION

As many nursing scholars have shown, a problem facing nurse educators is how to provide clinical learning experiences that will promote development of clinical judgment and increase self-efficacy in undergraduate nursing students. Clinical judgment is widely viewed as an essential skill for nurses (Tanner, 2006). After graduation, new nurses must be prepared to work in health care environments that are increasingly complex, with sicker patients and advanced medical technology. It is important for new nurses to have high levels of self-efficacy and be confident in their ability to make accurate clinical decisions (Decker, Sportsman, Puetz, & Billings, 2008; Etheridge, 2007). Hospital and nursing administrators expect graduates of nursing programs to have the ability to exercise clinical judgment. However, research has shown that many senior nursing students and graduate nurses are apprehensive about their ability to meet these clinical expectations (Etheridge, 2007; Heslop, McIntyre, & Ives, 2001; Kilstoff & Rochester, 2004). The findings of one national study demonstrated the significance of this problem. del Bueno (2005) reported that only 35 percent of graduate nurses were equipped to meet clinical judgment expectations for entry into nursing practice.

The dilemma of how to build clinical judgment and increase self-efficacy in nursing students is multi-factored. Clinical experiences are one traditional method nurse educators use to teach clinical judgment skills. It is during clinical activities that students learn how to perform technical skills, apply theory from the classroom, and make clinical judgment decisions

(Wagner, Bear, & Sander, 2009). The literature reflects that nurse educators encounter a number of problems regarding clinical settings. One problem is the lack of adequate clinical space; schools of nursing must often compete with each other to place students in clinical facilities (Gordon & Buckley, 2009; Harder, 2010; Jefferies, 2005; Sportsman et al., 2009). Insufficient numbers of clinical nursing faculty is another frequently reported issue (Harder, 2010; Jefferies, 2005; Sportsman et al., 2009). Complicating these problems is the fact that faculty have little control over types of patients encountered by students in health care settings. Brannan, White and Bezanson (2008) noted that students in hospital settings often do not have the occasion to care for patients with acute life-threatening conditions. This is due in part to increased patient acuity and concerns about patient safety which may limit students' participation in delivery of care (Alinier, Hunt, Gordon, & Harwood, 2006; Sportsman et al., 2009). Issues such as these make it difficult for nursing students to have clinical opportunities that will improve clinical judgment and foster self-efficacy (Sportsman et al., 2009).

Clinical limitations, such as those stated above, have caused educators to pursue alternative teaching methods. Use of high-fidelity simulation (HFS) is an alternative student-centered clinical activity that schools of nursing are incorporating into curriculum with increasing frequency. This instructional technology allows students to become actively engaged in the learning process and provides opportunities to practice assessment skills, critical thinking, and clinical decision making that are required of the professional nurse (Rothgeb, 2008). The use of models and mannequins to simulate clinical practice is not a new development. However, technological advances have made it possible for high-fidelity simulation mannequins to mimic life-threatening situations. The "human mannequin" or "simulator" is attached to a bedside telemetry monitor that is capable of producing vital statistics such as respirations, blood pressure,

and cardiac dysrhythmias. Through this technology, it is possible for nurse educators to design life-threatening clinical scenarios where students have a hands-on learning experience and the opportunity to make clinical decisions in a risk-free environment (Decker et al., 2008; Jefferies, 2005).

### **Theoretical Framework**

The theoretical framework chosen for this study was The Nursing Education Simulation Framework (Figure 1). This evidence-based framework was developed and tested by the National League for Nursing (NLN)/Laerdal Simulation Study. It was created to be used in nursing education research that explores effectiveness of simulation as an instructional method (Jefferies, 2005; Jefferies & Rogers, 2007). The conceptual framework incorporates five concepts that are significant to simulation design: (a) teacher factors, (b) student factors, (c) educational practices that need to be incorporated into the instruction, (d) simulation design characteristics, and (e) expected student outcomes. Each concept also contains variables that provide a context for research that explores various student outcomes and simulation design elements (Jefferies, 2005).

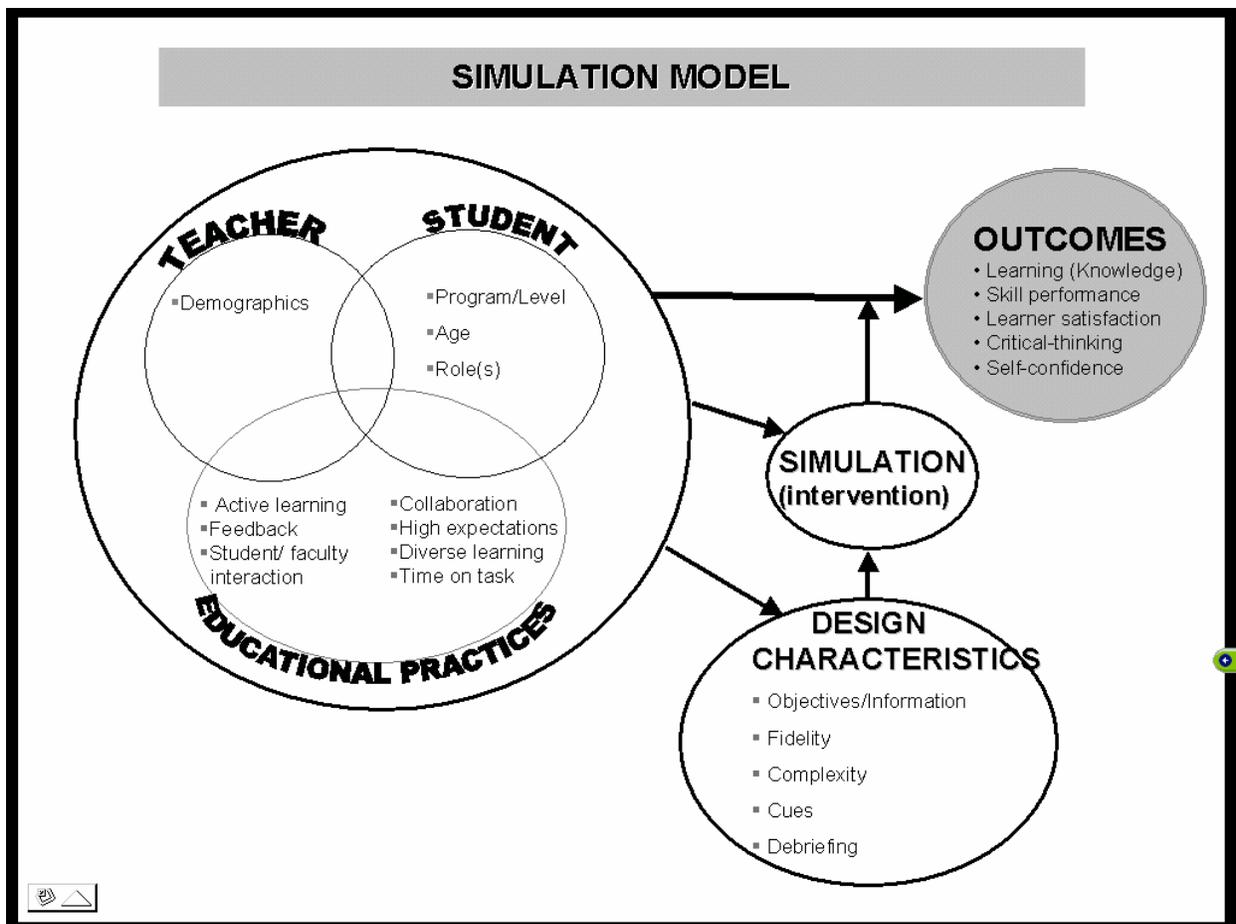


Figure 1. Nursing education simulation framework. Reprinted with the permission of the National League for Nursing, New York, NY.

The Nursing Education Simulation Framework (NESF) was selected for this proposed dissertation research because it includes several concepts that were used to guide the study. First, the framework provides a detailed description of simulation design characteristics such as fidelity, learning objectives, problem solving, student support, and debriefing. These concepts were used to develop the HFS intervention and guided the study. For example, in the framework high-fidelity simulation is defined as “a sophisticated, computerized mannequin that can mimic a real-life situation” (Jefferies & Rogers, 2007, p. 28). This is the definition that was used to define high-fidelity simulation in the study. Greater explanation of how the NESF was used throughout the study is included in chapter three which details the methodology.

Due to a slight difference in terminology, the dependent variables of the proposed study, which are self-efficacy and clinical judgment, are not specifically included in the NESF. However, self-confidence and critical thinking are closely related concepts and are included as variables under the heading of expected student outcomes. The framework also provided a context for student participants, such as demographic data, program, and level. Several variables in the NESF are relative to the study although they are not the primary focus. For example, simulation outcomes such as knowledge, skill performance, and learner satisfaction are not the focus of this study yet they are closely related to clinical judgment and self-efficacy (Jefferies & Rogers, 2007). In her discussion of the NESF, Jefferies (2005) noted that “all variables may not be relevant to all studies; however, the framework is intended to provide a context for relating a variety of likely variables” (p. 97). Indeed, there are some variables that were not explored in this study such as teacher demographics and educational practices although they undoubtedly influence the overall quality of HFS experiences. These variables may be explored in future studies.

### **Problem and Purpose Statements**

Nurse educators are faced with the problem of how to provide clinical learning experiences that effectively promote development of clinical judgment and increase perceptions of self-efficacy in undergraduate nursing students. To that end, high-fidelity simulation is an instructional technology that many nurse educators are incorporating into nursing curriculum. However, nursing education literature reflects several research gaps and supports the need for more research that explores the effectiveness of high-fidelity simulation in undergraduate nursing education. Therefore, the purpose of this study was to explore the effectiveness of using

multiple high-fidelity simulation experiences as a teaching method to develop clinical judgment and increase perceptions of self-efficacy in baccalaureate nursing students.

### **Significance**

This research is significant because expenses associated with developing and maintaining simulation laboratories are vast. The literature shows that many schools of nursing are investing great sums of money to develop simulation laboratories (Harder, 2010; Harlow & Sportsman, 2007; Tuoriniemi & Schott-Baer, 2008). Harlow & Sportsman (2007) conducted an economic analysis of a certain simulation laboratory. These authors reported the initial investment for a single adult patient simulator was \$27,000 and there were numerous other expenses associated with developing and maintaining the lab. Over a three year time period, the actual costs of this simulation lab was \$187,000 (Harlow & Sportsman, 2007).

Another reason, for this study's significance, is nurse educators should utilize evidence-based pedagogies. "Just as nurses share a commitment to basing their practice on the best available evidence, so too must nurse educators develop a science of nursing education" (NLN, 2003, pg. 3). There are some obvious benefits to HFS; however, questions about the efficacy of this teaching method need to be addressed. A small number of studies have examined student perceptions of self-confidence or self-efficacy following use of high-fidelity simulation, although results have produced conflicting data (Bambini, Washburn, & Perkins, 2009; Brannan et al., 2008; Smith & Roehrs, 2009). Studies that have explored effectiveness of using HFS to develop nursing clinical judgment are even more limited and have also produced conflicting results (Lasater, 2007a, 2007b; Ravert, 2008).

## Research Questions

High-fidelity simulation is a student-centered educational method; therefore, the effectiveness of this teaching method was explored by evaluating perceptions of students who participate in HFS. Three overarching research questions were explored.

1. What are Bachelor of Science in Nursing (BSN) students' perceptions of their clinical judgment performance following multiple high-fidelity simulation experiences over time?
2. What are BSN students' perceptions of self-efficacy following their performance in multiple high-fidelity simulation experiences over time?
3. Is there a relationship between perceptions of self-efficacy and clinical judgment in BSN students who participate in multiple high-fidelity simulation activities over time?

The goal of nursing education is to graduate nurses who have the skills and confidence necessary to practice nursing in the current health care environment. Nursing students need the ability to make sound clinical judgment decisions, and they should feel confident about their knowledge and skill performance. High-fidelity simulation is an instructional technology that may increase clinical judgment skills and increase self-efficacy in nursing students; however, evidence of the effectiveness of HFS in undergraduate nursing education is limited. Therefore, data from this research are a valuable contribution to the evidence-base for the science of nursing education.

## **Theoretical Definitions**

### **High-Fidelity Simulation**

High-fidelity simulation is the independent variable of the study. As stated previously, the theoretical definition for high-fidelity simulation is “a sophisticated, computerized mannequin that can mimic a real-life situation” (Jefferies & Rogers, 2007, p. 28). Various types of simulation research are available in the literature. The term simulation is defined by Jefferies (2005) “as activities that mimic the reality of a clinical environment and are designed to demonstrate procedures, decision making and critical thinking” (p. 97). The literature reflects that the term “simulation” is used loosely by researchers to describe a wide range of activities. For example, one study by Cioffi, Purcal, and Arundell (2005) defined simulation as an “assessment situation” (p. 132) where pairs of students participated in role-play activities. Other simulation researchers have studied various types of human patient mannequins. Simulation mannequins may be categorized according to their level of fidelity or degree of realism. Low-fidelity simulators are partial or whole body mannequins used to train students how to perform specific skills such as injections and catheterizations. Intermediate or medium-fidelity simulators are computerized partial body mannequins that are used to teach skills such as assessment of lung sounds (Alinier et al., 2006; Bambini et al., 2009; Decker, et al., 2008). For the purpose of this research, the operational definition for high-fidelity simulation is a highly technical, life-like human mannequin that breathes, talks, has heart and lung sounds, and is used to replicate evidence-based clinical scenarios for training purposes (Waxman, 2010).

### **Clinical Judgment**

Clinical judgment and self-efficacy are the dependent variables of this dissertation research. For the purpose of this study, the theoretical definition for clinical judgment is the

ability to recognize the relevant aspects of a clinical situation, interpret their meaning, respond appropriately, and reflect on the outcome while changing interventions as needed (Tanner, 2006). Clinical Judgment is defined by Tanner (2006) as the ability to think like a nurse. She conducted a literature review of almost 200 research articles on clinical judgment in nursing and, based on evidence, she developed a clinical judgment model for nursing. Tanner's Clinical Judgment Model identifies four phases of clinical judgment which are: (a) noticing, (b) interpreting, (c) responding, and (d) reflecting. The literature reflects that clinical judgment and other similar terms are significant topics for research in nursing education. Critical thinking, problem-solving, decision making, and clinical reasoning are all terms in nursing education literature that reflect similar concepts of clinical judgment (Cato, Lasater, & Peeples, 2009; Etheridge, 2007; Lasater, 2007a; 2007b; Tanner, 2006; Ravert, 2008; Rush, Dyches, Waldrop, & Davis, 2008). This study examined baccalaureate nursing students' perceptions of clinical judgment. Therefore, the operational definition for clinical judgment in this study is the student nurse's perceived ability to recognize the relevant aspects of a HFS clinical experience, interpret their meaning, respond appropriately, and reflect on the outcome while changing interventions as needed.

### **Self-Efficacy**

The theoretical definition of self-efficacy in this study is the "conviction that one can successfully execute the behavior required to produce the outcomes" (Bandura, 1977, p.193). The importance of student perceptions of self-efficacy and self-confidence has been a major topic of education research for a number of years. Self-efficacy was first described by Albert Bandura in 1977. In his historic article, Bandura developed a theory of behavioral change that emphasized the importance of personal efficacy. Bandura believed that personal

accomplishment and motivation are based on the foundation of self-efficacy, and that self-efficacy changes over time as new knowledge and skills are acquired. As self-efficacy increases, so does self-confidence. He theorized that a student's self-efficacy played a significant role in his/her successes and failures in school (Bandura, 1977). Based on these principles of self-efficacy, nursing students who have high perceptions of self-efficacy should feel confident in their ability to learn and develop clinical judgment skills. Therefore, for the purposes of this study, the operational definition of self-efficacy is student perceptions of confidence in one's ability to learn and perform clinical judgment skills in a high-fidelity simulation clinical experience.

### **Summary**

Many nurse educators face a problem of how to provide valuable clinical learning experiences that help students develop clinical judgment and increase their self-efficacy. In the past educators relied on traditional clinical teaching strategies; however, problems such as a limited number of clinical facilities, a shortage of nursing faculty, and inability to control the type of clinical experiences student encounter have caused some educators to use high-fidelity simulation as an alternative teaching strategy. High-fidelity simulation is expensive and there is little quantitative evidence to support the effectiveness of this clinical teaching method in undergraduate nursing education. The Nurse Education Simulation Framework was used as a conceptual guide for this study. The purpose of which, was to explore the effectiveness of using multiple high-fidelity simulation experiences to increase perceptions of clinical judgment and self-efficacy in baccalaureate nursing students over time.

## CHAPTER II

### REVIEW OF LITERATURE

In preparation for the study, a literature review was conducted using the key terms of high-fidelity simulation (HFS), self-efficacy (SE), and clinical judgment (CJ). Due to limited results the literature review was expanded to include the terms simulation, self-confidence, and critical thinking. The search was primarily conducted using the Cumulative Index of Nursing and Allied Health Literature (CINHAL) and Pro Quest Nursing and Allied Health databases. A few articles were found that traced the history of simulation and discussed development of its use in medical and nursing education. A discussion of these articles is presented to demonstrate that simulation is closely associated to gaming and considered a valuable active learning strategy in the education of various health care professionals. However, the primary focus of this literature review was simulation research that explores its' effectiveness in the development of clinical judgment and the promotion of self-efficacy. Qualitative, quantitative, and mixed method studies were included in the review. Preference was given to research that examined high-fidelity simulation among undergraduate nursing students, although research using medium and low-fidelity simulation and practicing health care professionals were not excluded.

#### **History of Simulation**

An examination of the history of simulation revealed a close relationship with gaming. Games and various types of simulation have been used to teach military strategy for centuries. For example, it is believed that the game of chess originated as a game of simulated war strategy

(Bradley, 2006; Henry, 1997; Ulione, 1983). However, the use of gaming as a formal educational strategy is a relatively new concept, as it was introduced by John Dewy approximately 100 years ago (Greeno, 2006; Henry, 1997). The literature reflects many benefits of using gaming as adjunct to traditional teaching methods. Games promote active learning, encourage critical thinking, foster decision making, make learning fun and exciting, decrease boredom, and replicate real-life circumstances (Henry, 1997; Royse & Newton, 2007; Ulione, 1983). Perhaps the greatest benefit of using games is their ability to actively engage learners. Researchers have shown that adults learn best when they actively participate in their own learning (Bowles, 2006; Candela, Dalley, & Benzel-Lindley, 2006; Henry, 1997; Royce & Newton, 2007; Sawyer, 2006). Games are particularly beneficial in the education of nurses and other health care professionals because they “connect theory more closely to real life experiences and allow the learner to practice in a simulated setting without the fear of real-life consequences” (Henry, 1997).

Ulione (1983) defined simulation games as an abstract form of reality that is played according to rules. She described a role play simulation game used to teach therapeutic communication skills to nursing students. The basic structural components of simulation games are “1) roles, 2) interactions, 3) rules, 4) goals, and 5) debriefing session” (p. 349). Simulation games have evolved over time from simple role play activities between two students to highly technical clinical scenarios played out by groups of students and high-fidelity human mannequins. The basic structural components of simulation games remain relatively unchanged (Bantz, Dancer, Hodson-Carlton, & Van Hove, 2007; Bradley, 2006; Comer, 2005; Decker et al., 2008).

The use of simulation in the education of health professionals is not a new phenomenon. The earliest use of simulation in health related professions was in medical education. Simulation has been used to train medical students in a variety of critical care settings such as emergency rooms, trauma centers, cardiac care, and anesthesia (Campbell, 2007). Simulation is considered a valuable teaching strategy in medical education because it is believed to enhance the development of medical decision making or clinical judgment in a controlled setting (Young, Smith, Guerlain, & Nolley, 2007).

Much is not understood about the effectiveness of simulation in medical education. Weller (2004) studied the effectiveness of using medium-fidelity simulation to help undergraduate medical students develop a systematic approach to problem solving. The author concluded that medium-fidelity simulators may be just as effective as high-fidelity simulators in undergraduate medical education. Therefore, due to the expense associated with high-fidelity simulators, medium-fidelity simulators may be preferred. There is a growing body of literature on high-fidelity simulation; however, the results of many studies are questionable. Issenberg, Mcgaghie, Petrusa, Gordon, and Scalese (2005) conducted a “Best Evidence Medical Education” systematic review of high-fidelity simulation literature. These authors found that only 109 articles from 670 were considered robust enough to be included in their review. Some positive features of HFS experiences found in the literature are they enhance learning by 1) providing a safe active learning environment, 2) providing opportunities for feedback, and 3) providing a range of clinical scenarios with various levels of difficulty (Bradley, 2006).

Harder (2010) conducted a systematic review of HFS literature in health science education between the years 2003-2007. This author included 23 out of 61 articles in her review. The author noted that 13 studies were conducted with students and 10 were with practicing

health care professionals. Sixteen studies were conducted in the field of nursing, six were in medicine and one was interdisciplinary. The author noted that, in general, evidence from the research indicates that use of HFS is an effective means to increase student's clinical skills and self-confidence.

### **Simulation and Self-efficacy/Confidence**

A small number of studies were discovered that examined student perceptions of self-efficacy or self-confidence following use of high-fidelity simulation, although results have produced conflicting data (Bambini et al., 2009; Blum, Borglund, & Parcells, 2010; Brannan et al., 2008; Smith & Roehrs, 2009). Several researchers reported that simulation was an effective means to increase self-efficacy or self-confidence. This finding was most often reported when HFS was used with graduate students or experienced health care professionals (Birch et al., 2007; Cioffi et al., 2005; Gordon & Buckley, 2009; Rush et al., 2008). The findings were somewhat different when HFS was used with undergraduate nursing students. Several researchers reported that undergraduate students reported low-confidence levels and feelings of anxiety associated with working in highly technical environments (Alinier et al., 2006; Brannan et al., 2008; Lasater, 2007a). Undergraduate students reported greater levels of confidence with low or medium-fidelity simulation (Bambini et al., 2009; Sinclair & Ferguson, 2009)

Sinclair and Ferguson (2009) reported significant findings from a mixed-methods study that explored the effects of mid-fidelity simulation to increase undergraduate nursing student's perceptions of self-efficacy. Subjects were a convenience sample of 250 second year baccalaureate nursing students who were divided into two groups. A control group received two hours of adult health and community/mental health lecture while the intervention group received one hour of lecture and one hour of mid-fidelity simulation and role-play activities. Data

collection was accomplished through completion of a demographic survey and a pretest-posttest modified Likert scale questionnaire titled “Baccalaureate Nursing Student Teaching-Learning Self-Efficacy Questionnaire.” These researchers reported that the intervention group had significantly higher self-efficacy scores than the control group. Recommendations for future research included assessment of clinical learning outcomes derived from simulation, examination of the relationship between theoretical knowledge and simulation, and exploration of how application of knowledge gained from simulation is used in clinical practice (Sinclair & Ferguson, 2009).

Birch et al. (2007) reported favorable results when HFS was used in the continuing education of health care professionals. These authors examined the effectiveness of three different teaching methods to train obstetric emergency skills to teams of midwives and medical staff at a hospital in the United Kingdom. The methods examined were lecture, HFS, and a combination of lecture and HFS. They found that teams who were taught by simulation alone were the only group to demonstrate long-term improvement in obstetric emergency skills and they experienced less anxiety in subsequent emergencies. However, the findings were not statistically significant due to the small sample size (Birch et al., 2007).

Research by Gordon and Buckley (2009) also supports the benefits of using HFS in graduate nursing education. They explored the effect of HFS on medical-surgical graduate nurses’ confidence and perceived ability to respond in clinical emergencies. The authors concluded that graduate nurses’ self-confidence and ability to perform skills were enhanced following HFS.

Some studies that have explored the use of HFS in undergraduate nursing education have been less favorable. Blum et al. (2010) studied the effectiveness of using high-fidelity

simulation to increase entry-level nursing students' self-confidence and clinical competence. The researchers used a quasi-experimental, quantitative control group design with 53 baccalaureate nursing students who were enrolled in an assessment course. The participants were placed in either a low-fidelity task-trainer laboratory or a high-fidelity simulation laboratory setting. The Lasater Clinical Judgment Rubric was used to measure students' perceptions of self-confidence and faculty evaluation of clinical competence. The researchers reported that HFS simulation appeared to have no statistically significant difference on the development of students' self-confidence and competence. Both groups experienced an increase in self-confidence and clinical competence regardless of the low-fidelity or HFS laboratory enrollment (Blum et al., 2010).

A study by Brannan et al. (2008) among undergraduate nursing students produced conflicting results. These researchers explored the effects of high-fidelity simulation in development of cognitive skills and confidence levels in baccalaureate nursing students enrolled in an adult health course. They used a pretest-posttest quasi-experimental, comparison group design. They found that the confidence level of students who participated in high-fidelity simulation was not significantly higher than students who received lecture only of the same content. On the other hand, the students who participated in HFS did have significantly higher cognitive scores than the comparison group of students (Brannan et al., 2008).

Researchers in the United Kingdom also reported low confidence levels in undergraduate nursing students who participate in simulated clinical experiences. Alinier et al. (2006) examined the effectiveness of using intermediate-fidelity simulation to improve self-confidence and clinical skill competence in undergraduate nursing students. The researchers used a pretest-posttest design to assess the clinical performance of volunteer students who were randomly

assigned to either a control or experimental group. A Likert scale questionnaire was used to assess confidence. Evaluation of clinical skill competence was by observation. The authors concluded that clinical skill competence may be achieved by intermediate-fidelity simulation. However, some students reported having low levels of confidence due to the stress they experienced while working in a highly technological environment (Alinier et al., 2006). Other researchers have also identified feelings of stress and anxiety associated with high-fidelity simulation in undergraduate nursing students (Bantz et al., 2007; Lasater, 2007a).

A descriptive study by Smith and Roehrs (2009) also had relevance to the current study as the authors used the Nursing Education Simulation Framework to guide their study. The focus of their study was to examine how certain elements of simulation design correlated with student satisfaction and self-confidence levels. Two Likert scale instruments developed by the NLN were used for data collection, the “Student Satisfaction and Self-Confidence in Learning Scale” and the “Simulation Design Scale”. The authors reported that simulation design, clear learning objectives, and an appropriately challenging problem were all significantly correlated with student satisfaction and self-confidence. Future research was recommended to study learning outcomes such as critical thinking and performance (Smith & Roehrs, 2009).

### **Simulation and Clinical Judgment**

Studies that have explored effectiveness of using HFS to develop nursing clinical judgment or critical thinking skills were even more limited and also produced conflicting results (Blum et al., 2010; Lasater, 2007a, 2007b; Ravert, 2008). The authors of some studies reported positive outcomes related to use of HFS in the development of clinical judgment (Bambini et al., 2009; Lasater, 2007a). For example, Bambini et al. (2009) conducted a mixed method study with entry level Bachelor of Science in Nursing (BSN) students. The purpose of their study was to

assess the effectiveness of simulated clinical activities, which included low, medium and high-fidelity simulation. These authors reported that students' self-confidence increased significantly following the simulated activities. They also identified themes of confidence, communication, and clinical judgment from qualitative data. In another mixed-method study, Lasater (2007a) examined the effectiveness of high-fidelity simulation on development of clinical judgment. A focus group was used to explore perceptions of baccalaureate nursing students following participation in high-fidelity simulation experiences. The author reported that data from the focus group supported the idea that HFS provides a means for students to develop clinical judgment skills, such as the ability to incorporate theory and psychomotor skills into clinical practice. Lasater (2007b) further explored development of clinical reasoning by creating a rubric to assess clinical judgment. The researcher then pilot tested the rubric with students in HFS experiences. The author concluded that the rubric was an effective means of assessing development of clinical judgment in a variety of clinical situations including high-fidelity simulation. Lasater (2007b) noted that research on the effects of HFS in the development of clinical judgment was scarce.

Researchers in Australia conducted a pilot study to examine the effectiveness of using simulated patient experiences to increase clinical decision making and confidence levels in midwifery students. These researchers did not use high-fidelity simulation or undergraduate students; however, they did explore the effectiveness of using role-play activities and simulated patient scenarios to teach basic midwifery content to advanced practice nursing students. The authors defined simulation as “a miniature version of some sphere of real-life activity that mimics clinical reality” (Cioffi et al., 2005, p. 132). Although this study did not use high-fidelity mannequins, it is pertinent to this study because it supports the use of clinical scenarios to foster

clinical decision making. The authors tentatively concluded that simulation activities promoted a deeper level of learning, had positive effects on decision making, and increased levels of confidence in participants. They recommended additional research with more rigorous methods and a larger sample size (Cioffi et al., 2005).

Radhakrishnan, Roche, and Cunningham (2007) conducted a quasi-experimental pilot study among 12 senior baccalaureate nursing students that produced mixed results. They examined the influence of HFS experiences on various aspects of clinical performance such as: safety, basic assessment skills, prioritization, problem-focused assessment, ensuing interventions, delegation, and communication. The authors reported that students who participated in HFS scored higher than the control group in safety and basic assessment skills. However, no significant difference was noted in the other areas. The authors noted several limitations of this small pilot study and stated that further nursing education research was needed in all aspects of HFS use (Radhakrishnan et al., 2007).

As stated previously, Blum et al. (2010) explored the relationship between HFS and student self-confidence and clinical competence. The authors used Tanner's Clinical Judgment Model as a framework for the study and the Lasater Clinical Judgment Rubric was used to measure faculty evaluations of students of clinical competence during HFS experiences. Entry level Bachelor of Science nursing students enrolled in an assessment and skills course were divided into control and experimental groups. The control group of students demonstrated skills using low-fidelity task trainer simulators and the experimental group demonstrated skills using a high-fidelity simulator. The authors reported evidence which indicated that self-confidence and clinical competence increased in both groups of students; but there was no statically significant difference between the groups. Furthermore, they concluded that use of expensive HFS

equipment with entry level nursing students needs further consideration. They also asserted that HFS is best used with advanced students in later semesters of nursing curriculum (Blum et al., 2010).

Researchers at the University of Pittsburgh conducted a study among pharmacy students enrolled in a cardiovascular pharmacotherapy course. Although this study was not conducted with nursing students, it was relevant to nursing education because it pertains to the education of health care professionals. The purpose of this research was to examine the effectiveness of HFS in developing and assessing pharmacy students' ability to think critically and solve problems pertaining to cardiovascular disease. The authors used a pretest-posttest design and student satisfaction survey. They reported positive results regarding use of HFS as a means of allowing pharmacy students to apply their knowledge and solve problems. The student satisfaction survey indicated that confidence and knowledge were gained from the simulation exercise (Seybert, Kobulinsky, & McKaveney, 2008). Their findings are somewhat different from those of other researchers (Alinier et al., 2006; Blum et al., 2010; Brannan et al., 2008).

Other studies have assessed the effectiveness of high-fidelity simulation in the development of critical thinking and have produced mixed results. Ravert (2008) studied the use of HFS in development of critical thinking among groups of baccalaureate nursing students. Students were placed in one of three groups, high-fidelity simulator, non-simulator and control. Results indicated that critical thinking increased in all groups of students; however, no statistically significant difference was found between the groups of students who experienced HFS and those who did not. In another study, Rush et al. (2008) examined use of high-fidelity simulation exercises with distance education Registered Nurse to Bachelor in Nursing (RN-BSN)

students. The authors reported that the RN-BSN students did experience improved critical thinking with this educational method when it was carefully planned (Rush et al., 2008).

### **Summary**

This literature review focused on research that examines the effectiveness of high-fidelity simulation in the development of clinical judgment and self-efficacy in BSN students. The literature revealed many studies that explored the effectiveness of using various forms of simulation as a teaching method in health care education. There was a growing body of literature about the effectiveness of using simulation in nursing education; although much of the research explored the use of various types of simulation. For example, some researchers reported that simulated clinical experiences which included a combination of low, medium, and high-fidelity simulation were an effective method to improve critical thinking and increase self-efficacy in undergraduate nursing students (Bambini et al., 2009; Sinclair & Ferguson, 2009). Numerous literature gaps remain, particularly in the area of high-fidelity simulation. Current research suggested that HFS was an effective teaching method in advanced practice nurse education and when used as a continuing education activity among experienced health care professionals (Gordon & Buckley, 2009; Seybert et al., 2008). Research regarding effectiveness of HFS in undergraduate nursing education remained limited and yields inconclusive or conflicting results. Lasater (2007a) reported that HFS was a way to increase clinical judgment in BSN students. While, Blum et al., (2010) found that high-fidelity simulators were no more effective than low-fidelity simulators in increasing BSN student's self-confidence and clinical competency. Several of the studies included in this literature review were small pilot studies and lacked a conceptual framework. Limitations such as these emphasized the need for further research. This literature review clearly demonstrated a need for further nursing education

research that examines the effectiveness of using high-fidelity simulation to promote development of clinical judgment and self-efficacy in baccalaureate nursing students.

CHAPTER III  
RESEARCH METHODOLOGY

**Introduction**

Evidence in the literature supports the educational use of high-fidelity simulation (HFS) to increase self-efficacy and clinical judgment for various health care professionals such as physicians, pharmacists, and advanced practice nurses (Birch et al., 2007; Gordon & Buckley, 2009; Harder, 2010; Seybert et al., 2008; Young et al., 2007). Yet, there were gaps in nursing education literature regarding the effectiveness of HFS in undergraduate nursing education. Notably, quantitative research supporting the effectiveness of HFS as a teaching method to increase clinical judgment and self-efficacy of undergraduate nursing students was limited. Therefore, the purpose of this study was to explore the effectiveness of using multiple HFS experiences as a teaching method to develop clinical judgment and increase perceptions of self-efficacy in baccalaureate nursing students. In this chapter the researcher describes the methodology and research design that was used to conduct the study.

**Research Design**

A quasi-experimental time series design was chosen for this study. After providing informed consent, a group of senior undergraduate nursing students voluntarily participated in a self-assessment survey following three different, non-punitive, high fidelity simulation experiences. Each HFS experience was a clinical scenario taken from the Program for Nursing Curriculum Integration (PNCI) developed by Medical Education Technology Incorporated

(METI) (Call, Trosclair, & Jeanice, 2007; Harbor & Martin, 2007; Leighton, 2007). The PNCI scenarios were designed specifically for use in nursing education and supported by evidence from nursing research. Each scenario contained chief simulation design elements outlined by the Nursing Education Simulation Framework (Jefferies, 2005; Jefferies & Rogers, 2007). Three different PNCI scenarios were utilized in the study. Each scenario addressed a life threatening clinical problem that required immediate nursing decisions and implementation of various nursing interventions. The first HFS scenario pertained to a patient with gastrointestinal hemorrhage. The second scenario involved a patient with severe burn and fluid volume deficit, while the final HFS experience concerned a patient in cardiopulmonary arrest. The first two HFS experiences were seven weeks apart during the middle of the spring semester 2011. The third HFS scenario took place the first week of the subsequent semester. Immediately following completion of each HFS experience, students voluntarily participated in a self-assessment survey on Qualtrics (Qualtrics, 2010).

Three instruments were used to gather data: (a) a demographic survey, (b) the Self-Confidence in Learning Using Simulations Scale (NLN, 2006), and (c) the Lasater Clinical Judgment Rubric (Lasater, 2007b). These instruments are described in greater detail in the instruments section of this chapter.

## **Sample**

The participants were from a group of 50 first semester senior nursing students in the Bachelor of Science in Nursing (BSN) program at the University of North Alabama. This convenience sample of students was enrolled in Adult Health II during the spring semester of 2011. The same students were enrolled in Leadership and Management in Nursing during the summer or fall of 2011. These students were selected for the study because they were senior

level BSN students and should have had an understanding of nursing process and clinical decision making based on previous nursing coursework. All students enrolled in Adult Health II during the spring and who planned to enroll in Leadership and Management in Nursing during the subsequent semester were invited to participate in the study. One student was excluded from the study because of part-time enrollment status. Forty nine students were invited to participate and took part in the study during data collection time one. Over the course of time, three students withdrew from the course for personal reasons. Eight participants enrolled in Leadership and Management in Nursing during summer of 2011. The remaining 38 participants took this class during fall 2011. Ultimately, 46 students completed the study for a 95% confidence interval (Raosoft, 2011).

### **Setting**

The setting was a simulation laboratory at a public university in the southeastern section of the United States. The university had approximately 8,000 students. The simulation lab housed the high-fidelity simulator and was sectioned to mimic private hospital rooms. One corner of the lab was designed to model a nursing station where a crash cart was located. . Members of the nursing faculty and staff were trained to operate the high-fidelity simulator mannequin. The simulation lab also included computers with internet access. Students who chose to participate in the study used these computers to access the online survey.

### **Ethical Considerations**

Prior to data collection, permission to study a convenience sample of volunteer BSN students on the campus of the University of North Alabama (UNA) was granted by the Internal Review Boards (IRB) at The University of Alabama (APPENDIX A) and the University of North Alabama (APPENDIX B). The researcher developed a detailed, informed consent form

which included, but was not limited to, information about the study and permission to use data for educational purposes, publications and presentation to professional audiences (APPENDIX C). The researcher was a member of the nursing faculty at UNA. Although the researcher did not teach either of the courses that were included in this study, it was important for the identity of the students to be protected from the researcher. Therefore, the researcher trained research assistants to help with data collection. The duties of the research assistants were to obtain informed consent from each participant and provide instructions for accessing and completing the survey.

Following completion of the first HFS experience in the simulation lab, a research assistant gave each student a copy of the informed consent form and copy of instructions for research participants (APPENDIX D). Students were informed that the decision to participate in the study and results of the study would not be part of the grading process for any class in which they were enrolled. Students who chose to participate gave consent by signing and dating the form. Students who decided not to participate were permitted to exit the room. Once the consent forms were signed, the research assistant collected the forms and signed them as a witness. The decision to have the research assistant “witness” the signing of consent forms was made to further protect the identity of the students from the researcher. Once the forms were properly signed, the assistant provided a copy for each student and sealed the original signed forms in a large envelope. The sealed envelope was locked in a file cabinet in the researcher’s office.

Following completion of the informed consent process, the research assistant proceeded by reading aloud the instructions for accessing the survey from a prepared script (APPENDIX E). The survey was disseminated to the students through Google email accounts created by the

researcher for this purpose (Google, 2010). Fifty separate email accounts were created, one for each potential participant. The username for each account was “unaconah” followed by a numeral, for example: “unaconah1”, “unaconah2”, “unaconah3” . . . through “unaconah50”. The password for each account was “metisurvey”. Each student was asked to draw a username from a box. The research assistant kept a record of the email accounts that were used and instructed the students to write their mother’s six digit birth date beside the login name as a form of identification. The participants were instructed to use the same email username and six digit birth date during each data collection period. This coding procedure was put in place to protect the identity of each subject and make it possible to perform statistical analysis on three sets of data from each subject, over time.

All data collected were stored in a locked file cabinet in the researcher’s office. The researcher, dissertation chairperson, and research assistants had access to the data. The data will be destroyed after four years.

## **Recruitment**

Students were recruited by face-to-face communication. Permission to have access to students in Adult Health II was obtained from the College of Nursing and Allied Health at the University of North Alabama and from the professor of the course. Two weeks prior to the first HFS experience, the researcher informed students in the Adult Health II course of the research project and extended an invitation to participate in the study. The researcher read from a prepared script (APPENDIX F). The script provided a detailed explanation of the study’s purpose and the students’ level of participation, time, and risk involved. Each potential participant received a written copy of the informed consent form during recruitment (APPENDIX C). All students had two weeks to review the informed consent form and consider

the decision of whether to participate in the study. On the day of the first HFS experience, a trained research assistant gave each student an additional copy of the informed consent form (APPENDIX C) and a copy of the instructions for participants information sheet (APPENDIX D). The assistant then read aloud from the research assistant's script (APPENDIX E) which included information to guide students through the process of signing the informed consent form. Students who chose to participate signed the informed consent form and then followed the directions for accessing and completing the survey through Qualtrics (Qualtrics, 2010).

### **Instruments**

Data collection was accomplished through use of three different self-report instruments. Each student volunteer completed an online survey comprised of the following instruments: (a) Demographic Survey (APPENDIX G), (b) Learner Satisfaction and Self-Confidence in Learning (LSSCL) (APPENDIX H), and (c) Lasater Clinical Judgment Rubric (LCJR) (APPENDIX I). Each of these instruments was used to form one survey through the internet survey tool, Qualtrics (Qualtrics, 2010) (APPENDIX J). Each participant answered the Qualtrics survey during each time of data collection, including the demographic questions. Table 1 includes how data from each instrument were used to answer the research questions.

Table 1

*Instruments of Measurement and Research Questions*

| Instrument of Measurement | Research Question  |
|---------------------------|--|
| LCJR                      | What are Bachelor of Science in Nursing (BSN) students' perceptions of their clinical judgment performance following multiple high-fidelity simulation experiences over time?  |
| LSSCL                     | What are BSN students' perceptions of self-efficacy following their performance in multiple high-fidelity simulation experiences over time?                                    |
| LSSCL and LCJR            | Is there a relationship between perceptions of self-efficacy and clinical judgment in BSN students who participate in multiple high-fidelity simulation experiences over time? |
| Demographic Survey        | Data used to describe participants, identify correlations between subjects and address limitations of study.   |

**Demographic Survey.** The first ten items in the survey (APPENDIX G) were demographic questions developed by the researcher for the purpose of gathering basic comparative data about each participant and to describe characteristics of the sample. The demographic survey required students to supply information about their age, gender, ethnicity, grade point average, role played during simulation activity, history of employment in a health care setting, and previous experience with patients who had symptoms similar to those encountered during each HFS experience. Tanners' Clinical Judgment model asserts that a nurses' perception of any given situation is affected by previous experiences (Lasater, 2007b; Tanner, 2006). Based on this assumption, a few extraneous variables were identified by the

researcher such as, history of employment in a health care setting and previous experience with patients who have problems similar to those encountered during HFS experiences. Therefore, the demographic survey included a few questions about work history and previous patient care experience. The participants took the demographic portion of the survey during all three times of data collection to assess to what degree these extraneous variables were present during each point in time. These findings are presented in Chapter IV and are discussed in Chapter V.

***Learner Satisfaction and Self-Confidence in Learning.*** Survey items 11-22 were taken from the Learner Satisfaction and Self-Confidence in Learning instrument (APPENDIX H). This instrument was developed by the National League for Nursing (2006) to be used specifically in high-fidelity simulation research. It has five items that measure learner satisfaction and eight items that measure self-confidence in learning. Participants responded to each of the 13 items using a five point Likert-type scale: (1) strongly disagree, (2) disagree, (3) undecided, (4) agree, and (5) strongly agree. The instrument is reliable with a Cronbach's alpha score of 0.87 (NLN, 2006). The NLN granted permission to use this instrument and make it available online (NLN personal communication, June 22, 2010). Data collected from items 15-22 specifically measured self-efficacy or self-confidence in learning. For example, item 17 states, "I am confident that I am developing the skills and obtaining the required knowledge from simulation to perform necessary tasks in a clinical." (NLN, 2006). During data analysis, individual responses to these items were totaled to obtain an overall self-efficacy (SE) score for each participant. Possible SE scores ranged from 8-40.

***Lasater Clinical Judgment Rubric.*** The third instrument included in the survey was the Lasater Clinical Judgment Rubric (APPENDIX I). Lasater (2007b) initially developed this instrument for faculty use when evaluating student performance during HFS. The rubric serves

as a guide to assess and measure clinical judgment. Internal consistency of this instrument with faculty use is high with reported Cronbach's alpha scores ranging from 0.783-0.914. Inter-rater reliability was reported to be 96% (Gubrud-Howe, 2008). Other researchers have reported successful use of the LCJR tool as a method for measuring nursing student's perceptions of confidence and clinical judgment following HFS experiences (Blum, et al., 2010; Cato et al., 2009). Permission to use the LCJR and adapt it to be included in the Qualtrics survey was obtained from the author (K. Lasater, personal communication, February 24, 2009).

The LCJR addresses each of the four components of clinical judgment as identified in Tanner's Clinical Judgment Model: noticing, interpreting, responding, and reflecting (Tanner, 2006). The LCJR further assess subcategories of each component of clinical judgment. For example, survey item 23 addresses noticing skills and includes the following subcategories: (a) focused observation, (b) recognizing deviations from expected patterns and (c) information seeking (APPENDIX I). Consequently, the LCJR includes a total of 11 items that assess for clinical judgment. Participants were asked to rate their selves in each area according to a four point Likert-type scale: (a) 1 beginning, (b) 2 developing, (c) 3 accomplished, or (d) 4 exemplary. During data analysis, individual responses to all LCJR items were totaled to find an overall clinical judgment (CJ) score for each participant. The minimum CJ score possible was 11 and the maximum possible score was 44.

### **Study Procedure**

As stated previously, high-fidelity simulation clinical experiences were the intervention of this study. All components of the HFS clinical experience were preplanned and part of normal course requirements in Adult Health II and Leadership and Management in Nursing. Therefore, all 49 students were expected to participate in HFS clinical experiences as scheduled

by their course instructor regardless of their decision to participate in the study. Students were divided into teams of four or five participants who worked together as members of a patient care team. Each team was assigned a specific time to participate in HFS. Each simulation experience contained four learning activities and took approximately two to four hours to complete. A nursing faculty member facilitated each team of students throughout HFS clinical experiences. The researcher was not present during any HFS clinical experiences.

As stated earlier, three different PNCI scenarios were chosen for the study. The first HFS experience was entitled *Gastrointestinal Bleed Secondary to Varices and Liver Failure* (Harbor & Martin, 2007), the second was entitled *Thermal Injury* (Call et al., 2007), and the third was entitled *Cardiopulmonary Arrest* (Leighton, 2007).

The Nursing Education Simulation Framework (NESF) illustrates key educational practices and design characteristics that are important to incorporate into high-fidelity simulation. Each HFS experience used in this study included four active learning phases which incorporated design characteristics supported by the NESF (Jefferies, 2005; Jefferies & Rogers, 2007). These four phases are explained in greater detail below.

**Phase 1.** The first phase centered on learner preparation for the HFS clinical experience. One week before each clinical activity, each student received a student's copy of the "Simulated Clinical Experience Overview". The overview contained a detailed patient history and specific information such as demographic data, vital statistics, medications, medical history, diet, activity level, social history, and health care provider's orders. Learning objectives and questions were also included. The students were asked to use prior knowledge and information taken from the textbooks and lectures to answer questions which prepared them

for the simulation experience. Learning objectives are an important component of simulation design and are included in the NESF (Jefferies, 2005; Jefferies & Rogers, 2007).

**Phase 2.** The second phase was a pre-conference. The faculty facilitator randomly assigned a nursing role for each student to play on a collaborative team. Roles assigned were: charge nurse, staff nurse, recorder, medication nurse, and assessment nurse. Next the faculty facilitator conducted a brief tour of the simulation lab. Before moving on to the actual simulation activity, the student participant who played the role of charge nurse led the team in a brief discussion of the information presented in the overview of the simulation experience. Information such as the patient's medical/social history, potential risk factors for hemorrhage or fluid volume deficit, medication lists, and physician orders were discussed. The pre-conference learning activity took approximately 20 minutes. The NESF supports the use of collaborative teams in simulation design because teamwork is an essential part of nursing practice and the delivery of quality patient care (Jefferies, 2005; Jefferies & Rogers, 2007).

**Phase 3.** Phase three was participation in the actual high-fidelity simulation experience. The purpose of the simulation experience was to provide students with a mock exercise of a patient crisis situation. Throughout the HFS experience, students used various nursing skills learned from previous courses. They performed patient assessments, obtained vital signs, administered medications, inserted intravenous and urinary catheters, kept patient records, and utilized therapeutic communication techniques. Students also had the opportunity to transfer knowledge gained in the preparation phase as they developed new skills. As the nursing students collaborated to make clinical decisions based on their assessment skills, some errors in judgment likely occurred. In these situations, the faculty facilitator offered guidance and formative feedback, and also allowed students the opportunity to make immediate revisions in

their care. The NESF supports student/faculty interactions and prompt feedback during simulation experiences (Jefferies, 2005; Jefferies & Rogers, 2007). The time frame for the third learning phase was approximately 30-45 minutes. The exact time to complete this phase of the HFS clinical experience varied slightly with each different HFS experience and group of students.

**Phase 4.** The fourth phase was a debriefing activity that was designed to encourage self-evaluation and critical reflection. Debriefing is a significant component of simulation design because it emphasizes the positive aspects of the experiences and encourages students to engage in metacognition (Jefferies, 2005). Students were asked to think about their individual and group performance in the simulation experience. Each team member was asked to identify personal and group strengths and limitations and share their thoughts in a group discussion. The debriefing activity lasted about 30-45 minutes. Each of the four learning activities was repeated in all three high-fidelity simulation experiences.

### **Data Collection**

The researcher collected data at three points in time. A time series design was selected for this study because of the absence of control group and randomization. A quasi-experimental design strengthened the ability to attribute an increase in self-confidence and clinical judgment to the intervention (Polit & Beck, 2008). Research assistants supervised data collection which took place at the culmination of each HFS experience. Once informed consent was obtained as described earlier, each student received a copy of instructions for participants (APPENDIX D) and the Lasater Clinical Judgment Rubric (APPENDIX I). These documents were given to students each time data were collected. Time 1 data collection was eight weeks into the spring 2011 semester of the Adult Health II course and followed a high-fidelity simulation experience

with a patient with a gastrointestinal bleed. Data from Time 1 served as baseline data. Approximately seven weeks later, data from Time 2 were collected following a thermal injury HFS experience. Time 3 data collection followed a cardiopulmonary arrest HFS experience that took place during the first week of the subsequent semester in the Leadership and Management in Nursing course. Eight participants were scheduled to take this course during the summer of 2011. For these participants, there was approximately a seven to eight week time interval between data collected at Time 2 and Time 3. However, the majority of participants ( $n = 38$ ) took Leadership and Management in Nursing during the fall of 2011. There was a greater interval of time, approximately 19 weeks, between the data collected at Time 2 and Time 3 for these participants. The inconsistent lengths of time between points of data collection are discussed in greater detail in the limitations section of Chapter V.

### **Data Analysis**

Following data collection, all data were entered into Statistical Package for the Social Sciences (SPSS) version 19 software, descriptive statistics were computed, and repeated measures analysis of variance (RM ANOVA) was conducted. First, SE scores and CJ scores were calculated for each participant at three points in time. Then descriptive statistics were calculated on these data to discover means and degrees of variance within subjects from time to time. Group mean scores were also calculated. Descriptive statistics of CJ and SE scores from Time 1 were used to establish base line measurement of students' perceptions of clinical judgment and self-efficacy following high-fidelity simulation experience. Variability was determined by computing standard deviation scores. Analyses of the data were completed by conducting a RM ANOVA to quantify the difference in the SE and CJ mean scores within the subjects over time. Descriptive statistics taken from the demographic survey were used to

describe the participants and identify the presence of certain extraneous variables. Data collected during Time 2 and Time 3 were used to demonstrate changes in students' perceptions of clinical judgment and self-efficacy following additional exposure to HFS experiences, over time. Regression and correlational analysis were performed on all SE and CJ scores to determine if there was a relationship between these scores. Table 2 identifies how each research question was addressed in terms of data analysis.

Table 2

*Research Questions and Data Analysis*

| Research Question  | Time 1 Base Line   | Times 2 & 3 Changes  |
|--|--|--|
| What are Bachelor of Science in Nursing (BSN) students' perceptions of their clinical judgment performance following multiple high-fidelity simulation experiences over time?  | Descriptive statistics from LCJR   | RM ANOVA from LCJR   |
| What are BSN students' perceptions of self-efficacy following their performance in multiple high-fidelity simulation experiences over time?                                    | Descriptive statistics from LSSCL  | RM ANOVA from LSSCL  |
| Is there a relationship between perceptions of self-efficacy and clinical judgment in BSN students who participate in multiple high-fidelity simulation experiences over time? | Correlational analysis of descriptive statistics and RM ANOVA scores from LCJR & LSSCL | Correlational analysis of descriptive statistics and RM ANOVA scores from LCJR & LSSCL |

**Summary**

In this chapter, the researcher has described the design and methodology used to conduct this study. A convenience sample of senior BSN students was asked to voluntarily participate in a self-assessment survey following completion of three different HFS experiences.

Each HFS experience contained key design features supported by the NESF. The online survey was comprised of items from three instruments: a) Demographic Survey, b) Learner Satisfaction and Self-Confidence in Learning instrument, and c) Lasater Clinical Judgment Rubric.

Descriptive statistics calculated on the first set of data were used to establish a base line for the first two questions which were exploratory in nature. RM ANOVA scores were then computed on all data to assess for differences in students' perceptions of clinical judgment and self-efficacy over time. Regression and correlational analysis were performed on the data to determine if there was a relationship between BSN student's perceptions of clinical judgment and self-efficacy following HFS. The results of data analysis are presented in Chapter IV.

## CHAPTER IV

### RESULTS

The purpose of this study was to explore the effectiveness of using multiple high-fidelity simulation (HFS) experiences as a teaching method in Bachelor of Science in Nursing (BSN) education to increase students' perceptions of clinical judgment and self-efficacy over time. The researcher followed a convenience sample of senior baccalaureate nursing students through three different HFS clinical experiences. Each HFS experience contained simulation design features supported by the Nursing Education Simulation Framework (Jefferies, 2005; Jefferies & Rogers 2007). Following completion of each HFS experience, participants were asked to voluntarily complete a survey that was designed to measure their perceptions of clinical judgment and self-efficacy. All data were entered into Statistical Package for the Social Sciences (SPSS) version 19 for data analysis. Descriptive statistics and repeated measures analysis of variance (RM ANOVA) were computed to answer the first two research questions. The third research question was answered by regression analysis and Pearson's correlation. In this chapter, the researcher reports the results of data collection and analysis. Statistical significance was determined by a maximum alpha level of .05. First a description of the sample is presented, including demographic data. Finally, examination of each research question and corresponding data analyses are presented.

#### **Sample**

A convenience sample of first semester senior nursing students enrolled in Adult Health Nursing II in the BSN program at a public university in the southeastern section of the United

States was used in the study. All BSN students enrolled in the Adult Health Nursing II course who planned to enroll in Leadership and Management in Nursing in the subsequent semester were included. Enrollment in this course was 50 students ( $n = 50$ ). One student was excluded from the study because of part-time enrollment status. This student did not plan to take Leadership and Management in Nursing during the subsequent semester and was consequently unable to complete the study within the required time frame. All remaining students ( $n = 49$ ) were invited to participate on a voluntary basis. All students ( $n = 49$ ) chose to participate in the study during data collection Time 1. Prior to data collection Time 2, one student withdrew from the Adult Health Nursing II course for academic reasons. Two students did not participate during Time 3, because personal reasons prevented enrollment in Leadership and Management in Nursing the subsequent semester. Finally, 93.8% of the subjects ( $n = 46$ ) completed the study for a 95% confidence interval.

### **Demographic Data**

Half of the participants, 50% ( $n = 23$ ), in this study were between 19 and 22 years of age. Most participants, 83% ( $n = 38$ ), were female and 17% ( $n = 8$ ) were male. The vast majority of participants, 87% ( $n = 40$ ), described themselves as being non-Hispanic white. Other ethnic groups represented were American Indian ( $n = 1$ ), African American ( $n = 1$ ), and other ( $n = 4$ ). Forty-eight percent ( $n = 22$ ) of participants reported a grade point average (GPA) of 3.0 - 3.49, 26% ( $n = 12$ ) indicated a GPA of 3.5 - 4.0, and another 26% ( $n = 12$ ) indicated a GPA of 2.5 - 2.99. Table 3 provides a listing of major demographic characteristics.

Table 3

*Demographic Characteristics of Participants (n = 46)*

| Descriptor                     | <i>N</i> | %  |
|--------------------------------|----------|----|
| Gender                         |          |    |
| Male                           | 8        | 17 |
| Female                         | 38       | 83 |
| Age                            |          |    |
| 19-22                          | 23       | 50 |
| 23-27                          | 15       | 33 |
| 28-32                          | 4        | 9  |
| 33-37                          | 1        | 2  |
| 37 and above                   | 3        | 6  |
| Ethnicity                      |          |    |
| American Indian/Alaskan Native | 1        | 2  |
| Black/African American         | 1        | 2  |
| Non-Hispanic White             | 40       | 87 |
| Other                          | 4        | 9  |
| Grade Point Average (GPA)      |          |    |
| 3.5 - 4.0                      | 12       | 26 |
| 3.0 - 3.49                     | 22       | 48 |
| 2.5 - 2.99                     | 12       | 26 |
| Role Played During Simulation  |          |    |
| Recorder                       | 11       | 23 |
| Charge Nurse                   | 10       | 22 |
| Medication Nurse               | 10       | 22 |
| Staff Nurse                    | 5        | 11 |
| Assessment Nurse               | 10       | 22 |

The researcher determined that previous work history and patient care experience might affect perceptions of clinical judgment and self-efficacy. Therefore, a few questions in the

demographic survey were designed to determine to what degree these extraneous variables existed among the participants. Data collected from Time 3 indicated that 26% of the participants ( $n = 12$ ) had previous work experience in a patient care setting. However, the vast majority of participants  $n = 32$  (70 %) had no prior experience of working with patients who had symptoms similar to those encountered during the HFS experience. A complete summary of these data can be found in Table 4.

Table 4

*Previous Employment History and Patient Care Experience*

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|  |               |               |               |
|--|---------------|---------------|---------------|
| Have you ever been employed in a health care setting?  |               |               |               |
|  | <u>Time 1</u> | <u>Time 2</u> | <u>Time 3</u> |
| Yes  | n = 10 (22%)  | n = 12 (26%)  | n = 12 (26%)  |
| No   | n = 36 (78%)  | n = 34 (74%)  | n = 34 (74%)  |
| Do you have previous experience caring for patients with symptoms similar to those encountered during today's high fidelity simulation experience? |               |               |               |
| Yes  | n = 10 (22%)  | n = 1 (2%)    | n = 14 (30%)  |
| No   | n = 36 (78%)  | n = 45 (98%)  | n = 32 (70%)  |

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**Findings**

**Research Question 1: What are Bachelor of Science in Nursing (BSN) students' perceptions of their clinical judgment performance following multiple high-fidelity simulation experiences over time?**

To address Research Question 1, senior BSN students voluntarily answered a survey following three different HFS experiences. The online survey included the Lasater Clinical Judgment Rubric (LCJR) which produced data about each student's perception of their personal clinical judgment performance during the HFS experience. All data were entered into SPSS Version 19 for data analysis. First, the researcher computed Clinical Judgment (CJ) scores for each

participant from each time of data collection. Clinical judgment scores were computed by adding together responses to all LCJR items. The minimum CJ score possible was 11 and the maximum was 44. Next, descriptive statistics were computed to achieve group mean CJ scores and standard deviations for each time of data collection. These data revealed an increase in CJ scores occurred at each time of data collection. Table 5 contains a summary of the descriptive statistics for clinical judgment scores for each time of data collection

Table 5

*Descriptive Statistics for Clinical Judgment Scores*

| Data Set        | Mean   | Std. Deviation | <i>n</i> |
|-----------------|--------|----------------|----------|
| CJ Score Time 1 | 28.478 | 5.180          | 46       |
| CJ Score Time 2 | 29.608 | 6.027          | 46       |
| CJ Score Time 3 | 29.891 | 4.967          | 46       |

A repeated measures ANOVA (RM ANOVA) was used to answer Research Question 1. Significance was established at the  $p < .05$  level. Table 6 presents the results of tests of between-subjects effects which proved significant with  $F = 1744.767$  ( $df = 1, 45$ ) level of significance .000.

Table 6

*Tests of Between-Subjects Effects*

| Source    | Type III Sum of Squares | <i>df</i> | Mean Square | <i>F</i> | Sig.  |
|-----------|-------------------------|-----------|-------------|----------|-------|
| Intercept | 118682.674              | 1         | 118682.674  | 1744.767 | 0.000 |
| Error     | 3060.993                | 45        | 68.022      |          |       |

Table 7 contains a summary of pairwise comparisons of CJ scores. Findings from RM ANOVA indicate there was a statistically significant difference ( $p = .041$ ) in participants' perceived clinical judgment between Time 1 and Time 3. No statistically significant difference was found between Time 1 and Time 2 ( $p = .094$ ) although this result suggests a possible difference, less than .10, which some consider an acceptable level of significance. There was also no significant difference between Time 2 and Time 3 ( $p = .659$ ). A Least Significant Difference post hoc analysis was run to compare clinical judgment scores between groups. The difference in mean score between Time 1 and Time 3 was (-1.413). These data indicate that the mean difference between CJ scores was greater following the HFS experience at Time 3 than HFS experience at Time 1. Therefore, Bachelor of Science in Nursing students' perceptions of clinical judgment significantly increased following multiple high-fidelity simulation experiences over time.

Table 7

*Pairwise Comparisons of CJ Scores*

| (I)<br>Time | (J)<br>Time | Mean<br>Difference<br>(I-J) | Std.<br>Error | Sig. <sup>a</sup> | 95% Confidence Interval<br>for Difference |                |
|-------------|-------------|-----------------------------|---------------|-------------------|---|----------------|
|             |             |                             |               |                   | Lower<br>Bound                            | Upper<br>Bound |
| 1           | 2           | -1.130                      | .661          | .094              | -2.461                                    | .200           |
|             | 3           | -1.413*                     | .673          | .041              | -2.768                                    | -.058          |
| 2           | 1           | 1.130                       | .661          | .094              | -.200                                     | 2.461          |
|             | 3           | -.283                       | .635          | .659              | -1.562                                    | -.997          |
| 3           | 1           | 1.413*                      | .673          | .041              | .058                                      | 2.768          |
|             | 2           | .283                        | .635          | .659              | -.997                                     | 1.562          |

*Note.* Based on estimated marginal means

<sup>a</sup>Adjustment for multiple comparisons: Least Significant difference (equivalent to no adjustments).

\*The mean difference is significant at the .05 level.

**Research Question 2: What are BSN students' perceptions of self-efficacy following their performance in multiple high-fidelity simulation experiences over time?**

To address Research Question 2, self-efficacy scores for each participant were calculated by totaling their responses to the eight Learner Satisfaction and Self-Confidence in Learning (LSSCL) survey items that assessed self-confidence in learning (NLN, 2006). The LSSCL tool also included five questions to assess learner satisfaction; however, these data were not included in total self-efficacy (SE) scores. Each participant received three SE scores, one from each time of data collection. The minimum possible SE score was 8 and the maximum score was 40. Descriptive statistics (Table 8) were computed from participants' SE scores to achieve the group mean SE score and standard deviation for each time of data collection. The group mean SE score for time 3 was 35.434 which indicates students had relatively high perceptions of self-efficacy following the multiple HFS experiences, considering the maximum possible score was 40.

Table 8

*Descriptive Statistics of Self-efficacy Scores*

| Data Set        | Mean   | Std. Deviation | N  |
|-----------------|--------|----------------|----|
| SE Score Time 1 | 33.456 | 3.95927        | 46 |
| SE Score Time 2 | 33.565 | 3.69776        | 46 |
| SE Score Time 3 | 35.434 | 3.03792        | 46 |

RM ANOVA was used to answer Research Question 2. Significance was established at the  $p < .05$  level. Table 9 includes the results of tests of between-subjects effects, which was significant with  $F = 6860.328$  ( $df = 1, 45$ ) level of significance .000.

Table 9

*Tests of Between-Subjects Effects*

| Source    | Type III<br>Sum of Squares | <i>df</i> | Mean Square | <i>F</i> | Sig.  |
|-----------|----------------------------|-----------|-------------|----------|-------|
| Intercept | 1609590.196                | 1         | 160959.196  | 6860.328 | 0.000 |
| Error     | 1055.804                   | 45        | 23.462      |          |       |

Findings from RM ANOVA indicate that a statistically significant difference in SE scores did exist between Time 1 and Time 3 ( $p = .003$ ). A significant difference was found to exist in SE scores between Time 2 and Time 3 ( $p = .001$ ). There was no significant difference between Time 1 and Time 2 ( $p = .848$ ). A Least Significant Difference post hoc analysis was run to compare self-efficacy scores between groups. The difference in mean score between Time 1 and Time 3 was (-1.978). The difference in mean score between Time 2 and Time 3 was (-1.870). These data indicate that the mean difference in SE scores was greater following the HFS experience at Time 3 than HFS experiences at Time 1 or Time 2. Table 10 contains a summary of pairwise comparisons of SE scores over time. Therefore, Bachelor of Science in Nursing students' perceptions of self-efficacy increased significantly following multiple high-fidelity simulation experiences over time.

Table 10

*Pairwise Comparisons of Self-efficacy Scores*

| (I)<br>Time | (J)<br>Time | Mean<br>Difference<br>(I-J) | Std.<br>Error | Sig. <sup>a</sup> | 95% Confidence Interval for<br>Difference <sup>a</sup> |                |
|-------------|-------------|-----------------------------|---------------|-------------------|--|----------------|
|             |             |                             |               |                   | Lower<br>Bound   | Upper<br>Bound |
| 1           | 2           | -.109                       | .565          | .848              | -1.246   | 1.029          |
|             | 3           | -1.978*                     | .619          | .003              | -3.255   | -.732          |
| 2           | 1           | .109                        | .565          | .848              | -1.029   | 1.246          |
|             | 3           | -1.870*                     | .533          | .001              | -2.942   | -.797          |
| 3           | 1           | 1.978*                      | .619          | .003              | .732   | 3.225          |
|             | 2           | 1.870*                      | .533          | .001              | .797   | 2.942          |

*Note.* Based on estimated marginal means

<sup>a</sup> Adjustment for multiple comparisons: Least Significant difference (equivalent to no adjustments).

\*The mean difference is significant at the .05 level.

**Research Question 3: Is there a relationship between perceptions of self-efficacy and clinical judgment in BSN students who participate in multiple high-fidelity simulation activities over time?**

Research Question 3 was addressed by performing regression analysis to determine if there was a relationship between students' perceptions of clinical judgment and self-efficacy following HFS experiences. The results of regression analysis (Table 11) indicated there was a slight positive correlation (sig. = .003) between perceptions of self-efficacy and clinical judgment. However, only 18% (Pearson's  $R^2 = 0.1806$ ) of the variance was attributed to HFS experience. The remaining 82% of variance was unaccounted for, but may be attributed to previous history of employment in a health care setting and previous experience caring for patients with symptoms similar to those encountered during the HFS experiences (Table 4). Nevertheless, there was a

slightly positive relationship between BSN students' perceptions of self-efficacy and clinical judgment following multiple high-fidelity simulation experiences over time.

Table 11

*Regression Analysis*

|          |                     | Total SE | Total CJ |
|----------|---------------------|----------|----------|
| Total SE | Pearson correlation | 1        | 0.425    |
|          | Sig. (2-tailed)     |          | 0.003    |
|          | N                   | 46       | 46       |
| Total CJ | Pearson correlation | 0.425    | 1        |
|          | Sig. (2-tailed)     | 0.003    |          |
|          | N                   | 46       | 46       |

**Summary**

The researcher attempted to answer three research questions in this study. The purpose of the first research question was to investigate the effectiveness of using multiple high-fidelity simulation experiences to develop clinical judgment in senior BSN students over time. Clinical judgment was measured through changes in students' perception over time. This question was answered using RM ANOVA. The findings revealed a significant difference ( $p = .041$ ) in student perceptions of clinical judgment between Time 1 and Time 3. The purpose of Research Question 2 was to examine the effectiveness of using multiple HFS experiences to increase BSN students' perceptions of self-efficacy over time. An RM ANOVA was also used to answer this question. The findings indicated there was a significant difference ( $p = .003$ ) in students' perceptions of self-efficacy between Time 1 and Time 3. A significant difference ( $p = .001$ ) also was found in SE scores

between Time 2 and Time 3. The purpose of Research Question 3 was to determine if there was a relationship between BSN students' perceptions of self-efficacy and clinical judgment following participation in multiple HFS experiences over time. This question was answered by performing regression analysis. The researcher found a slight positive correlation ( $\text{sig.} = .003$ ) existed between students' perceptions of self-efficacy and clinical judgment following HFS experiences. In Chapter V, the researcher will discuss these findings, confer implications for nursing education and practice, disclose research limitations, and make recommendations for future studies.

## CHAPTER V

### DISCUSSION, IMPLICATIONS, AND RECOMMENDATIONS

As stated previously, del Bueno (2005) documented that 35% of graduates from nursing programs are unprepared to meet entry-level clinical judgment expectations for practice. Evidence suggests that new nurse graduates are often apprehensive about their ability to meet clinical demands of the nursing role (Heslop et al., 2001; Kilstoff & Rochester, 2004). Complicating these issues, are the additional problems nurse educators face when placing students in clinical learning facilities. Issues such as these have led to use of high-fidelity simulation (HFS) as an adjunct to traditional teaching methods; but evidence regarding effectiveness of HFS in entry-level nurse education is limited. Some researchers have shown that low-fidelity and medium-fidelity simulation may be used to promote critical thinking and increase self-efficacy in undergraduate nursing students (Bambini et al., 2009; Rush et al., 2008; Sinclair & Ferguson, 2009). However, Blum et al. (2010) found that HFS was no more effective than low-fidelity simulation in increasing undergraduate nursing students' perceptions of self-confidence and skill competency. Thus, the purpose of this quasi-experimental time series design study was to explore the effectiveness of using three different high-fidelity simulation experiences as a teaching method to develop clinical judgment (CJ) and increase perceptions of self-efficacy (SE) in baccalaureate nursing students. In this chapter the researcher discusses significant findings, implications, and recommendations for future study.

## Significant Findings

**Research Question 1: What are Bachelor of Science in Nursing (BSN) students' perceptions of their clinical judgment performance following multiple high-fidelity simulation experiences over time?**

Senior level BSN students were asked to voluntarily answer a self-reflective survey, designed to measure perceptions of clinical judgment and self-efficacy, following three different HFS experiences. During data analysis, clinical judgment scores were computed from each participant's responses to the Lasater Clinical Judgment Rubric (LCJR) portion of the survey. Next, group mean scores were computed for each time of data collection. These data indicated that clinical judgment group means increased after each HFS experience. Overall, students perceived that their clinical judgment was between the developing and accomplished levels, according to the LCJR continuum scale. Pairwise comparison of group means was performed to determine if there was a statistically significant difference between mean scores over time. These findings revealed a significant increase in mean CJ scores from Time 1 to Time 3 and indicated that senior level, undergraduate nursing students did have a significant increase in their perceptions of clinical judgment following three different high-fidelity simulation experiences. The mean scores for Time 1 indicated that perceived clinical judgment was approximately mid-range between developing and accomplished levels. However, by the end of data collection Time 3, students' perception of clinical judgment had increased significantly, toward the accomplished level. This finding of the researcher is supported by a few researchers, who have conducted qualitative or mixed-method studies (Bambini et al., 2009; Lasater, 2007a). For example, Bambini et al. (2009) reported finding qualitative themes of clinical judgment. Namely, the students in their study expressed that HFS improved their ability to prioritize,

identify abnormal findings and know when and how to intervene. Lasater (2007a) also reported themes of clinical judgment from her qualitative study. The undergraduate students in her study voiced that HFS taught them the value of assessing and reassessing patient status. Lasater concluded that HFS improved their development of clinical judgment. Similarly, this researcher also found that undergraduate nursing students' perceptions of clinical judgment increased following multiple HFS experiences over time. Perhaps, participating in multiple HFS experiences increased students' ability to notice, interpret, respond, and reflect on the HFS patient's condition, and therefore, produced increased perceptions of clinical judgment.

**Research Question 2: What are BSN students' perceptions of self-efficacy following their performance in multiple high-fidelity simulation experiences over time?**

A score for self-efficacy was calculated for each participant by totaling their responses to the eight survey items that addressed self-confidence in learning. Group mean SE scores were then calculated for each time of data collection. These data revealed that mean SE scores increased each time data were collected. Pairwise comparison of these means showed significant differences in means between Time 1 and Time 3 and also between Time 2 and Time 3. These findings indicated that senior BSN students' perception of self-efficacy significantly increased following multiple HFS experiences over time. This researcher's findings are consistent with Bambini et al. (2009) who found a significant increase in self-confidence of first semester baccalaureate nursing students who participated in a simulated obstetric clinical which included a combination of low, medium, and high-fidelity simulations. Their study was similar to this study because it included multiple patient scenarios and high-fidelity simulation. The findings of this researcher and those of Bambini et al. (2009) indicate that participation in multiple HFS experience made students feel more confident.

**Research Question 3: Is there a relationship between perceptions of self-efficacy and clinical judgment in BSN students who participate in multiple high-fidelity simulation activities over time?**

Regression analysis was performed to determine if there was a relationship between these two dependent variables, following HFS experiences. These data revealed a slightly positive correlation (sig. = .003) between the self-efficacy scores and clinical judgment scores. Pearson correlation results indicate that students' who participated in high-fidelity simulation perceived higher levels of self-efficacy as their perception of clinical judgment performance also improved. Blum et al. (2009) used the LCJR to measure faculty evaluation of clinical competence and entry-level BSN students' perception of confidence. These authors reported a positive correlation between these two dependent variables. In a somewhat related study, Smith and Roehrs (2009) assessed the relationship between Nursing Education Simulation Framework (NESF) design characteristics and satisfaction and self-confidence levels of students who participate in HFS. The design characteristics studied were: objectives, support, fidelity, problem solving, and guided reflection. The authors reported that clear learning objectives and appropriately challenging problems were significantly correlated with student satisfaction and self-confidence (Smith & Roehrs, 2009). The findings of this researcher are in fact supported by research by Bandura, (1977). Bandura reported that self-efficacy was a "predictor of performance on tasks varying in difficulty" (Bandura, 1977, p. 206).

**Discussion**

The goal of undergraduate nurse education is to adequately prepare nurses to meet the demands that are required in 21<sup>st</sup> century health care. In current society, "nurses must make critical decisions associated with care of sicker, frailer patients and work with sophisticated, life-

saving technology” (Institute of Medicine, 2011). Often, this tremendous responsibility is thrust upon new nurses immediately after graduation; therefore, as Tanner (2006) so aptly stated, it is essential for new nurses to have the ability to “think like a nurse” (p. 208). It is also important for graduate nurses to feel confident in their ability to make clinical judgment decisions (Etheridge, 2007; Heslop et al., 2001; Sinclair & Ferguson, 2009; Wagner et al., 2009). Findings from this research support the idea that there are effective strategies to assist with enhancing clinical judgment and self efficacy to ensure that new graduates function at a level sufficient to meet the demands of 21<sup>st</sup> century health care.

Use of HFS in undergraduate nurse education has increased dramatically in recent years. The effectiveness of this teaching method is well documented in medicine, pharmacy, advanced practice nursing, and various other health professions (Bradley, 2006; Decker et al. 2008; Harder, 2010; Issenberg et al., 2005; Laschinger et al., 2008). However, there has been relatively little evidence of its effectiveness in the education of entry level nurses, particularly regarding the development of clinical judgment. Therefore, this researcher’s findings are exciting and significant, because they offer quantitative evidence that HFS may be effectively used as a teaching method in undergraduate nurse education to increase clinical judgment and promote self-efficacy.

One of this researcher’s goals was to measure senior BSN students’ perceptions of clinical judgment following multiple high-fidelity simulation experiences and assess whether these perceptions of clinical judgment increased significantly over time. According to the LCJR scale (Lasater, 2007b), the student participants in this study perceived their clinical judgment was in the “developing” level at Time 1 and by the end of Time 3 perceptions of clinical judgment had increased significantly toward the “accomplished” level; indicating that the

students perceived themselves more ready to face the challenges required of today's registered nurses. These findings are significant to nurse educators because they demonstrate that quantitative studies have the potential to detect or denote differences as well as qualitative studies.

No other quantitative studies were found where researchers have explored the use of HFS to increase students' perceptions of clinical judgment over time. In a few quantitative studies, researchers have compared the effectiveness of high-fidelity simulation to low-fidelity simulation in increasing student outcomes that are similar to clinical judgment such as critical thinking and clinical competence (Ravert, 2008; Blum et al., 2001). Ravert (2008) reported no significant difference in critical thinking of undergraduate students who participated in multiple HFS experiences when compared to those who did not. The author suggested this result was due to small sample size which limited the power of the study (Ravert, 2008). Blum et al. (2009) also reported no significant difference in clinical competence of beginning baccalaureate nursing students who performed basic clinical skills on a high-fidelity mannequin than those who performed the same skills on a low-fidelity mannequin. The difference in results from these two studies may be attributed to a difference in purpose and research design. The studies by Ravert (2008) and Blum et al. (2010) were designed to compare which type of simulation was most effective. They did not assess for differences in critical thinking or clinical competence over time. The intent of the researcher in the current study was to quantify differences in clinical judgment within groups of students who participated in multiple HFS experiences over time. This researcher found the cumulative effect of the three different HFS experiences resulted in increased perceptions of clinical judgment. Although mean clinical judgment scores increased during each time of data collection; no statistically significant difference was found between

Time 1 and Time 2 or between Time 2 and Time 3. This signifies that multiple HFS experiences may produce progressive development of clinical judgment in undergraduate nursing students. These findings add to nursing education literature that supports incorporation of HFS throughout nursing curricula.

The findings of this researcher not only support use of HFS to increase clinical judgment, they also support use of the Lasater Clinical Judgment Rubric to measure students' perceptions of clinical judgment performance during HFS experiences. Tanner (2006) noted that the beginning nurse develops clinical judgment through analytical reasoning. Based on Tanner's Clinical Judgment Model (Tanner, 2006), the LCJR (Lasater, 2007b) provided a means by which students could think analytically as they examined and quantified their ability to notice, interpret, respond and reflect during each HFS experience. The debriefing phase of HFS is a time of self-reflective learning where students are encouraged to think critically and link theory to practice (Jefferies, 2005). The LCJR is a valuable tool to use during debriefing sessions. Educators should also consider additional ways to increase analytical reasoning and self-reflection during HFS experiences. Clinical judgment is a complex developmental process which may take years of experience to master; but the findings of this researcher indicate that HFS and the LCJR may be effectively used to help undergraduate nursing students progress from thinking like a student toward the goal of thinking like a nurse.

The significant finding of this researcher, that senior BSN students' perceptions of self-efficacy increased following each HFS experience and SE scores increased from Time 1 to Time 3 and from Time 2 to Time 3, supports the work of Sinclair and Ferguson (2009) who also found self-confidence (self-efficacy) of second year undergraduate students increased by use of mid-fidelity simulation. Similarly, Wolf and Gantt (2008) reported that HFS continuing

education sessions increased the confidence levels of experienced nurses. However, other researchers have studied the effectiveness of various types of simulation for increasing self-confidence in undergraduate nursing students and have reported no significant difference (Alinier et al., 2006; Brannan et al., 2008). This difference may be attributed to the fact that students in the current study were familiar with HFS, as they had participated in HFS experiences during each of their previous two semesters of study. Alinier et al. (2006) studied the effects of medium-fidelity simulation on the development of clinical skills, competence, and confidence in undergraduate nursing students. In their study, students were being introduced to simulation technology for the first time. These authors found that students were not confident with working in a technical environment and may have experienced stress associated with unfamiliar technology. Lasater (2007a) reported that student confidence actually decreased with HFS. Anxiety associated with using advanced technology was cited as one reason for this finding. Interestingly, in this study, simulation was also being introduced into the nursing curriculum for the first time (Lasater, 2007a) and it is conceivable that both students and faculty may have experienced feelings of anxiety associated with new technology.

In the current study, both senior students and faculty facilitators had participated in HFS experiences prior to beginning the study. Therefore, it is unlikely that “simulation anxiety” was a significant factor in this study. In fact, it may be inferred from this researcher’s findings that incorporation of HFS throughout nursing curriculum may result in less anxiety resulting in greater perceptions of self-efficacy and clinical judgment over time. Clinical judgment and self-efficacy are in fact development processes which increase with knowledge and experience. Some researchers have suggested that high-fidelity simulation should not be used with beginning nursing students because it is expensive and no more effective than low-fidelity simulation

(Blum et al., 2010). However, this researcher contends that HFS technology should not be reserved for advanced students. Yes, this technology is expensive; therefore it should be utilized with all levels of undergraduate nursing students to maximize its cumulative benefits. The findings of this researcher indicate that students who are exposed to this technology early in nursing programs will have decreased anxiety as they become more familiar with its use. Thus, they will have increased perceptions of self-efficacy as they participate in HFS experiences and develop clinical judgment along the way. Nurse education researchers should consider conducting a longitudinal study that examines the effects of HFS throughout nursing curriculum to develop clinical judgment and self-efficacy in a cohort of students. A study of this type may provide greater insight into the development of clinical judgment and self-efficacy through use of HFS.

The findings of this researcher revealed a slightly positive correlation ( $\text{sig.} = .003$ ) between self-efficacy and clinical judgment and a small percentage of this relationship was attributed to HFS experiences. While it is impossible to identify all the extraneous variables that may have influenced students' perceptions of clinical judgment and self-efficacy over time, the researcher has identified a few. Previous employment history and prior experience caring for patients with similar symptoms may influence perceptions of clinical judgment and self-efficacy. The data revealed that 26% of participants had prior history of working in a health care setting and 30% of the participants had worked with a patient who had symptoms similar to those encountered during the cardio-pulmonary arrest HFS experience. Although their results were not analyzed separately, these students may have had higher levels of clinical judgment and self-efficacy because of previous experience and this experience may have impacted findings for the group. Another extraneous variable was the 19-week time lapse between Time 2 and Time 3. It

is possible that some students may have participated in other activities which increased their perceptions of clinical judgment and self-efficacy during this 19-week period. On the other hand, it is also possible that some students actually were less confident due to the long break between HFS experiences. The researcher considered these extraneous variables prior to data collection, but chose to proceed with the study because it reflected reality; extraneous variables and time intervals are common in nursing curricula. Future studies may be designed with greater control of these variables.

In addition to answering the research questions, there are other aspects of this study which should be discussed. The findings of this researcher indicate that properly planned and implemented HFS experiences are an effective method of increasing undergraduate students' perceptions of clinical judgment and self-efficacy. Rush et al. (2008) found that HFS had a potential to increase critical thinking and confidence levels of registered nurse to Bachelor of Science in Nursing (RN-BSN) distance education students, yet these authors stressed that simulation experiences must be carefully planned. This researcher concurs and advocates the use of a conceptual framework such as the evidence-based Nursing Education Simulation Framework (Jefferies, 2005; Jefferies & Rogers, 2007) used in this study. Each of the three HFS experiences used in this study contained key NESF educational practices which included active learning, feedback, faculty/student interaction, and collaborative learning. The literature reflects that students learn best when they are actively engaged in the learning process (Bowles, 2006; Candela et al., 2006; Jefferies, 2005). The high-fidelity simulation experiences used in this study provided ample opportunities for students to actively participate as individual nurses and collaborate as members of a health care team. Throughout each HFS experience, the students received immediate feedback from a faculty facilitator whenever it was needed. The results of

this study support the inclusion of these educational practices and use of the NESF to develop HFS experiences.

### **Implications**

The findings of this researcher have several implications for nurse educators. High-fidelity simulation is an effective teaching method for undergraduate nursing education and educators should incorporate multiple HFS experiences throughout nursing curriculum. It may be inferred from the repeated measures design of this study that students benefit from participating in multiple HFS experiences, even from one semester to the next. The cumulative effects of HFS demonstrated by this researcher's findings suggest that early use of this technology with entry level students will lead to greater development of clinical judgment and self-efficacy. Additionally, educators should utilize an evidence-based framework, such as the NESF, to develop HFS experiences. Proper planning and execution are vital to effective HFS experiences. It is important to note that development of HFS laboratories is an expensive endeavor that may not be feasible for some schools of nursing. However, educators in these programs should consider using less costly forms of simulation such as online simulation programs and perhaps video-recorded HFS experiences (Rush et al., 2008). In the researcher's opinion, educators should also consider using the LCJR to help students self-reflect about their clinical judgment performance during HFS. This tool is a means by which students may quantify their clinical judgment, and help them identify areas where they need improvement. The educational practices of this framework may be linked to student outcomes of clinical judgment and self-efficacy. However, one must be cautious about drawing too many conclusions from these results as student perceptions may not necessarily equate with actual clinical judgment performance. Finally, it is essential for educators to implement evidence-based teaching

methods. The literature reflects a great need for nurse education reform (American Association of Colleges of Nursing, 2008; IOM, 2011; NLN, 2005). Although, the senior students in this study did experience statistically significant increases in their perceptions of clinical judgment and self-efficacy; the results also demonstrate they still have much to learn; given the relatively mediocre perceptions of clinical judgment reported in this study. This result reinforces the need for nurse educators to utilize evidence-based teaching methods.

These research findings also have important implications for nursing practice. It is important that employers recognize that clinical judgment is a developmental process. Upon graduation many students meet minimum qualifications for entry into practice, but meeting minimum qualifications for nursing practice does not mean nurse graduates have mastered all aspects of clinical judgment, nor are they filled with confidence. HFS experience should not stop with initial nurse education. Employers of new nurses should use HFS in orientation programs not only to verify specific competencies, but also to assess clinical judgment. Continuing use of HFS into practice may help bridge the gaps between nursing education and nursing practice. Employers of new nurses may also help educators by keeping them informed of strengths and weaknesses that are identified in new nurse graduates. If employers took a more active role in the preparation of nurses for practice, perhaps clinical judgment of new nurses would increase even more.

### **Limitations**

It is important to note limitations of the study that may affect the validity and/or generalizability of the results. The following limitations have been identified by the researcher:

- The study was conducted using a relatively small convenience sample of subjects from one southeastern university. The result was a homogeneous subject pool.

- A 19 week lapse of time occurred between data collection times two and three compared to a 7 to 8-week time difference between times one and two. This difference in time intervals between data collection may have altered the results of the study.
- A small percentage of subjects reported they had prior experience caring for patients with symptoms similar to those encountered during HFS. This variable of prior experience with similar patients may have skewed the results.
- Student perceptions were used to measure clinical judgment. Faculty evaluation of clinical judgment may produce different results, because it is conceivable that faculty evaluations of students' clinical judgment performance would be different from students' perceptions of clinical judgment performance.
- Self-efficacy was measured by the Learner Satisfaction and Self-Confidence in Learning Scale. This tool was designed to measure self-confidence (NLN, 2006); therefore it may not be an accurate measurement for self-efficacy. Yet, researchers agree that these concepts are closely associated (Bandura, 1977; Sinclair & Ferguson, 2009).

### **Recommendations**

After considering the results, implications, and limitations of the study, the researcher has identified areas for future research studies. Recommendations for future research include the following:

- Replication of the study with a larger sample size, including multiple sites, to produce a more diverse subject pool and increase the generalizability of the study.

- Repeat the study with an extended longitudinal design using more times of data collection. Beginning with first semester BSN students and continuing throughout the nursing curriculum would increase understanding of the development of clinical judgment.
- Repeat the study with a counterbalanced design. The participants could be randomly assigned to one of three groups, who would participate in each of the three different HFS experiences in altered order.
- In future studies researchers might examine the effect HFS has on the four aspects of Tanner's Clinical Judgment Model (Tanner, 2006).
- Nurse education researchers might also explore ways to enhance HFS experiences to achieve greater development of clinical judgment in BSN students.
- Future studies might include comparison of faculty evaluation of clinical judgment performance to students' perceptions of clinical judgment.

### **Conclusion**

Researchers have shown a need for evidence-based teaching methods that promote the development of clinical judgment and increase self-efficacy of entry level nurses. Many nurse educators are using HFS as an alternative teaching method in undergraduate nursing programs; yet there has been little evidence to support its use in undergraduate nursing education. Results from this study indicate HFS experiences are an effective clinical teaching method to use with undergraduate nursing students. Data analysis revealed that senior BSN students' perceptions of clinical judgment significantly increased following three different high-fidelity simulation experiences. The results of this study also showed that multiple HFS experiences significantly increased perceptions of self-efficacy among senior BSN students. The findings of this

researcher should be used to support the integration of HFS throughout nursing programs to develop clinical judgment and increase self-efficacy in undergraduate nursing students. This study had several limitations. Therefore, further research is needed to better understand the development of clinical judgment and self-efficacy in nursing students and also to understand the best practices for implementing HFS throughout nursing curricula.

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## APPENDIX A

December 17, 2010

Office for Research  
Institutional Review Board for the  
Protection of Human Subjects

THE UNIVERSITY OF  
**ALABAMA**  
R E S E A R C H

Vicki Pierce  
Capstone College of Nursing  
The University of Alabama  
Box 870358

Re: IRB # 10-OR-404 "Baccalaureate Nursing Students' Perception of  
Clinical Judgment and Self-Efficacy Following High-Fidelity Simulation"

Dear Ms. Pierce:

The University of Alabama Institutional Review Board has granted  
approval for your proposed research

Your application has been given expedited approval according to 45 CFR  
part 46. Approval has been given under expedited review category 7 as  
outlined below:

*(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.*

Your application will expire on December 16, 2011. If your research will  
continue beyond this date, complete the relevant portions of Continuing  
Review and Closure Form. If you wish to modify the application,  
complete the Modification of an Approved Protocol Form. When the  
study closes, complete the appropriate portions of FORM: Continuing  
Review and Closure.

Please use reproductions of the IRB approved informed consent form to  
obtain consent from your participants.

Should you need to submit any further correspondence regarding this  
proposal, please include the above application number.

Good luck with your research.

Sincerely,



152 Rose Administration Building  
Box 870117  
Tuscaloosa, Alabama 35487-0117  
(205) 348-8461  
FAX (205) 348-8882  
TOLL FREE (877) 820-3066

Carpanta T. Myles, MSM, CIM  
Director & Research Compliance Officer  
Office for Research Compliance  
The University of Alabama

APPENDIX B



Date to Committee: October 4, 2010

Principal Investigator(s): Vicki Pierce

Title of Research Proposal: Baccalaureate Nursing Student's Perception  
Of Clinical Judgment and Self-Efficacy  
Following High-Fidelity Simulation

Date Approval Ends: One Year from Date Approved

IRB Action: This proposal complies with University and Federal Regulations for the protection of human subjects (45 CFR46). Approval is effective for a period of one year from the date of this notification.

\_\_\_\_\_  
Victoria Hulse, Chair  
Human Subjects Committee

Date Approved: October 8, 2010

OFFICE of the VICE PRESIDENT for ACADEMIC AFFAIRS and PROVOST

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## APPENDIX C

### UNIVERSITY OF ALABAMA

#### **Individual's Consent to be in a Research Study**

You are being asked to be in a research study. The study is called “Baccalaureate Nursing Students’ Perception of Clinical Judgment and Self-Efficacy Following High-Fidelity Simulation”. This study is being done by Vicki Pierce, a doctoral student at the University of Alabama.

The study is supported by a small professorship from the College of Nursing and Allied Health at the University of North Alabama. The money covers the costs of research expenses such as travel, data collection instruments, and research assistants.

#### **What is this study about?**

Many schools of nursing use computerized human mannequins to teach students how to think critically and react like a nurse. These mannequins are called “high-fidelity simulators”. Students work together in teams and practice giving care to a simulated patient with a specific medical condition. This study is seeking to understand if simulated clinical experiences are an effective way to teach undergraduate nursing students. Specifically, the investigator would like to know how effective high-fidelity simulation experiences are in making nursing students feel confident about their ability to think like a nurse.

#### **Why is this study important?**

Research has shown that many employers of new nursing graduates do not think they have critical thinking skills when they start their first nursing job. Hospital clinical experience is necessary in nursing education but may not always be available. For example, many nursing students may not have the opportunity to care for a patient in a medical emergency. Nurse educators need to understand if alternative teaching methods like simulated clinical experiences are an effective way to teach students how to think like a nurse. This study will help nursing teachers understand if students can learn to think like a nurse in a simulated clinical experience.

#### **Why have I been asked to take part in this study?**

You are being asked to take part in this study because you are a senior baccalaureate nursing student at the University of North Alabama and are currently enrolled in NU 407 Adult Health II and will be enrolled in NU 411 during your final semester of study. These two courses include simulated clinical experiences in their content.

**How many people will be in this study?**

The investigator is inviting all students enrolled in NU 407 to take part in the study.

**What will I be asked to do in this study?**

If you agree to be in this study, you will answer computer survey questions about how confident you are in your ability to think like a nurse during a simulated clinical experience. You will have two (2) simulated clinical experiences in NU 407 during the fall 2010 semester and one (1) simulated clinical experience in NU 411 during the spring 2011 semester. You will be asked to complete the survey immediately after each of these simulated clinical experiences.

**How much time will I spend being in this study?**

The survey will take approximately 20-25 minutes to complete. You will be asked to take the same survey after three (3) different simulated clinical experiences.

**Will being in this study cost me anything?**

The only cost to you is your time.

**Will I be compensated for being in this study?**

You will not be compensated for your time. You will not receive a grade for being in the study.

**What are the risks (problems or dangers) from being in this study?**

There are minimal risks from being in this study. You may become tired or uncomfortable while you answer the survey questions. You may feel stress while you participate in the high-fidelity simulation and when you evaluate your performance during the simulation activity. Your participation in the study is voluntary. Your decision to take part or not to take part will not affect your course grade.

**What are the benefits of being in the study?**

You will benefit from taking part in the study by thinking about what you have learned and identifying how you can be a better nurse.

**How will my privacy be protected?**

The only place your name will appear in connection with the study is on this informed consent form. A trained research assistant will collect the consent forms, place them in a sealed envelope and lock them in a file drawer in the investigator's office. You will be asked to use your mother's birth date as an identifier each of the three times you take the survey.

**How will my confidentiality be protected?**

You will answer the survey on a computer in the computer lab. Paper copies of the information you provide will be kept in a locked file drawer in the investigators office. The information you provide in the survey will be kept confidential.

The investigator will use the data from this study to write a dissertation. In addition, the data may be used to write research articles and make professional presentations; but participants will be identified only as "nursing students in Northwest Alabama".

**What are the alternatives to being in this study?**

The only alternative is not to participate.

**What are my rights as a participant?**

Being in this study is totally voluntary. It is your free choice. You may choose not to be in it at all. If you start the study, you can stop at any time. Not participating or stopping participation will have no effect on your relationships with the University of North Alabama or the University of Alabama.

The University of Alabama Institutional Review Board is a committee that looks out for the ethical treatment of people in research studies. They may review the study records if they wish. This is to be sure that people in research studies are being treated fairly and that the study is being carried out as planned.

**Who do I call if I have questions or problems?**

If you have questions about this study right now, please ask them. If you have questions later on, please call Vicki Pierce at 256-765-6301. If you have questions or complaints about your rights as a research participant, call Ms. Tanta Myles, the Research Compliance Officer of the University of Alabama at 205-348-8461.

You may also ask questions, make a suggestion, or file complaints and concerns through the IRB Outreach Website at [http://osp.ua.edu/site/PRCO\\_Welcome.html](http://osp.ua.edu/site/PRCO_Welcome.html) . After you participate, you are encouraged to complete the survey for research participants located on the same website, or you may ask Vicki Pierce for a copy of it. You may also send an e-mail to [participantoutreach@bama.ua.edu](mailto:participantoutreach@bama.ua.edu).

I have read this consent form. I have had a chance to ask questions.

---

Signature of Research Participant Date

---

Signature of Investigator Date

## APPENDIX D

### Instructions for Participants

- 1) Please draw one piece of paper from this box. The paper you select will have a “Username” name for a Google email account.
- 2) After you have selected a “username” please claim the account by writing your mother’s six digit birth date in the blank space beside the appropriate “username” as a form of identification. You will use this same “username” each time you complete the survey.
- 3) Next you may access the survey go to <http://www.gmail.com/>
- 4) Sign in to gmail by entering the following information:  
Username: (Selected by you. For example: “unaconah4”)  
Password: metisurvey  
Click “Sign in” to access account
- 5) Open email from Vicki Pierce and follow instructions to take the survey.
- 6) Please answer all questions truthfully.
- 7) Items number 22, 23, 24, and 25 are related to clinical judgment. These items ask you to rate various components of your clinical judgment according to the Lasater Clinical Judgment Rubric. A copy of the Lasater Clinical Judgment Rubric is stapled to this instruction sheet. The rubric defines and describes four levels of clinical judgment: (a) Beginning, (b) Developing, (c) Accomplished, and (d) Exemplary. Please think about your actions during the HFS experience and rate your performance according to the criteria found in the rubric. For example item number 22 asks:  
  
“Think about your thought process and performance during the simulation experience. According to the Lasater Clinical Judgment Rubric, how would you rate your "noticing" skills in each of the following areas?”  
  
Focused Observation:  
Beginning ( ) Developing ( ) Accomplished ( ) Exemplary ( )  
  
Recognizing Deviations from Expected Patterns:  
Beginning ( ) Developing ( ) Accomplished ( ) Exemplary ( )  
  
Information Seeking:  
Beginning ( ) Developing ( ) Accomplished ( ) Exemplary ( )
- 8) After you have completed the survey, log out of the “gmail” account and exit the room.
- 9) Please notify the research assistant if you have any questions or concerns.

## APPENDIX E

### **Script for Research Assistant**

Thank you for participating in this research study and self-evaluation exercise.

You have before you an Informed Consent Form. Please read it carefully and ask any questions you may have. If you agree to participate in the study, sign and date the form in the space provided on the last page. I will collect the signed form and give you a copy of it. You will also receive a copy of directions for the study. All original consent forms will be placed in an envelope that will be sealed and stored in a locked file cabinet in the researcher's office.

Once all forms have been collected I will read the instructions for accessing and completing the survey aloud to you and then you may begin the study.

### **Instructions for Participants**

- 1) Please draw one piece of paper from this box. The paper you select will have a "Username" name for a Google email account.
- 2) After you have selected a "username" please claim the account by writing your mother's six digit birth date in the black space beside the appropriate "username" as a form of identification. You will use this same "username" each time you complete the survey.
- 3) Next you may access the survey go to <http://www.gmail.com/>
- 4) Sign in to gmail by entering the following information:  
Username: (Selected by you. For example: "unaconah4")  
Password: metisurvey  
Click "Sign in" to access account
- 5) Open email from Vicki Pierce and follow instructions to take the survey.
- 6) Please answer all questions truthfully.

- 7) Items number 22, 23, 24, and 25 are related to clinical judgment. These items ask you to rate various components of your clinical judgment according to the Lasater Clinical Judgment Rubric. A copy of the Lasater Clinical Judgment Rubric is stapled to this instruction sheet. The rubric defines and describes four levels of clinical judgment: (a) Beginning, (b) Developing, (c) Accomplished, and (d) Exemplary. Please think about your actions during the HFS experience and rate your performance according to the criteria found in the rubric. For example item number 22 asks:

“Think about your thought process and performance during the simulation experience. According to the Lasater Clinical Judgment Rubric, how would you rate your "noticing" skills in each of the following areas?”

Focused Observation:

Beginning ( ) Developing ( ) Accomplished ( ) Exemplary ( )

Recognizing Deviations from Expected Patterns:

Beginning ( ) Developing ( ) Accomplished ( ) Exemplary ( )

Information Seeking:

Beginning ( ) Developing ( ) Accomplished ( ) Exemplary ( )

- 8) After you have completed the survey, log out of the “gmail” account and exit the room.
- 9) Please notify the research assistant if you have any questions or concerns.

## APPENDIX F

### **Recruitment Script to be read by Principal Investigator**

Hello, I am Vicki Pierce. You know me as a member of the nursing faculty here at the University of North Alabama and the NU 409 Maternity nursing teacher; but I am also a graduate student at the University of Alabama. I am working on my doctorate degree in the area of nursing education. I have asked your professor's permission to speak to you today, so that I may make you aware of my dissertation study, and invite you to participate in the study. At this time I will give each of you a copy of the informed consent form. Please read the form as I read it aloud to you, and do not hesitate to ask any questions you may have. The study will begin in two weeks, immediately following your first regularly scheduled high-fidelity (or human patient) simulation experience; therefore, you will have two weeks to consider your decision to participate. (*Pass out a copy of the Informed Consent Form - to be read aloud*).

#### UNIVERSITY OF ALABAMA Individual's Consent to be in a Research Study

You are being asked to be in a research study. The study is called "Baccalaureate Nursing Students' Perception of Clinical Judgment and Self-Efficacy Following High-Fidelity Simulation". This study is being done by Vicki Pierce, a doctoral student at the University of Alabama.

The study is supported by a small professorship from the College of Nursing and Allied Health at the University of North Alabama. The money covers the costs of research expenses such as travel, data collection instruments, and research assistants.

#### **What is this study about?**

Many schools of nursing use computerized human mannequins to teach students how to think critically and react like a nurse. These mannequins are called "high-fidelity simulators". Students work together in teams and practice giving care to a simulated patient with a specific medical condition. This study is seeking to understand if simulated clinical experiences are an effective way to teach undergraduate nursing students. Specifically, the investigator would like to know how effective high-fidelity simulation experiences are in making nursing students feel confident about their ability to think like a nurse.

#### **Why is this study important?**

Research has shown that many employers of new nursing graduates do not think they have critical thinking skills when they start their first nursing job. Hospital clinical experience is necessary in nursing education but may not always be available. For example, many nursing students may not have the opportunity to care for a patient in a medical emergency. Nurse

educators need to understand if alternative teaching methods like simulated clinical experiences are an effective way to teach students how to think like a nurse. This study will help nursing teachers understand if students can learn to think like a nurse in a simulated clinical experience.

**Why have I been asked to take part in this study?**

You are being asked to take part in this study because you are a senior baccalaureate nursing student at the University of North Alabama and are currently enrolled in NU 407 Adult Health II and will be enrolled in NU 411 during your final semester of study. These two courses include simulated clinical experiences in their content.

**How many people will be in this study?**

The investigator is inviting all students enrolled in NU 407 to take part in the study.

**What will I be asked to do in this study?**

If you agree to be in this study, you will answer computer survey questions about how confident you are in your ability to think like a nurse during a simulated clinical experience. You will have two (2) simulated clinical experiences in NU 407 during the fall 2010 semester and one (1) simulated clinical experience in NU 411 during the spring 2011 semester. You will be asked to complete the survey immediately after each of these simulated clinical experiences.

**How much time will I spend being in this study?**

The survey will take approximately 20-25 minutes to complete. You will be asked to take the same survey after three (3) different simulated clinical experiences.

**Will being in this study cost me anything?**

The only cost to you is your time.

**Will I be compensated for being in this study?**

You will not be compensated for your time. You will not receive a grade for being in the study.

**What are the risks (problems or dangers) from being in this study?**

There are minimal risks from being in this study. You may become tired or uncomfortable while you answer the survey questions. You may feel stress while you participate in the high-fidelity simulation and when you evaluate your performance during the simulation activity. Your participation in the study is voluntary. Your decision to take part or not to take part will not affect your course grade.

**What are the benefits of being in the study?**

You will benefit from taking part in the study by thinking about what you have learned and identifying how you can be a better nurse.

**How will my privacy be protected?**

The only place your name will appear in connection with the study is on this informed consent form. A trained research assistant will collect the consent forms, place them in a sealed envelope and lock them in a file drawer in the investigator's office. You will be asked to use your mother's birth date as an identifier each of the three times you take the survey.

**How will my confidentiality be protected?**

You will answer the survey on a computer in the computer lab. Paper copies of the information you provide will be kept in a locked file drawer in the investigators office. The information you provide in the survey will be kept confidential.

The investigator will use the data from this study to write a dissertation. In addition, the data may be used to write research articles and make professional presentations; but participants will be identified only as “nursing students in Northwest Alabama”.

**What are the alternatives to being in this study?**

The only alternative is not to participate.

**What are my rights as a participant?**

Being in this study is totally voluntary. It is your free choice. You may choose not to be in it at all. If you start the study, you can stop at any time. Not participating or stopping participation will have no effect on your relationships with the University of North Alabama or the University of Alabama.

The University of Alabama Institutional Review Board is a committee that looks out for the ethical treatment of people in research studies. They may review the study records if they wish. This is to be sure that people in research studies are being treated fairly and that the study is being carried out as planned.

**Who do I call if I have questions or problems?**

If you have questions about this study right now, please ask them. If you have questions later on, please call Vicki Pierce at 256-765-6301. If you have questions or complaints about your rights as a research participant, call Ms. Tanta Myles, the Research Compliance Officer of the University of Alabama at 205-348-8461.

You may also ask questions, make a suggestion, or file complaints and concerns through the IRB Outreach Website at [http://osp.ua.edu/site/PRCO\\_Welcome.html](http://osp.ua.edu/site/PRCO_Welcome.html) . After you participate, you are encouraged to complete the survey for research participants located on the same website, or you may ask Vicki Pierce for a copy of it. You may also send an e-mail to [participantoutreach@bama.ua.edu](mailto:participantoutreach@bama.ua.edu).

*(Closing remarks to be read from script - not in Informed Consent Form).*

Finally, I want to stress that participation in this study is strictly a volunteer basis. You will not be penalized if you do not participate, nor will you be rewarded if you participate. Your decision will not affect your grade in any course. The procedures that are in place to protect your identity will be up-held.

Thank you for your time this morning. I hope each of you will consider participating in the study. It should prove to be a beneficial learning experience to you and you will be making a valuable contribution to nursing education research. If you have any questions do not hesitate to ask me. My phone number is listed on the informed consent form and my office is Room 224 of Stevens Hall.

## APPENDIX G

### Demographic Survey Questions

1. Please enter your mother's six (6) digit birth date in the space below. For example, the date June 3, 1965 should be entered 06-03-65. You will enter this number each time you answer the survey following your simulation experiences.

\_\_\_\_\_

2. What is your sex/gender?

- Male
- Female

3. What is your age? (If you are <19 years - STOP HERE and contact the research assistant because study participation is not permitted for persons under 19 years of age.)

- 19-22
- 23-27
- 28-32
- 33-37
- 37 and up

5. How do you describe yourself? (Please, check the one option that best describes you)

- American Indian or Alaska Native
- Hawaiian or Other Pacific Islander
- Asian or Asian American
- Black or African American
- Hispanic or Latino
- Non-Hispanic White

6. What is your grade point average?

- 3.5-4.0
- 3.0-3.49
- 2.5-2.99
- Below 2.5

7. What was your role in the high-fidelity simulation exercise?

- Recorder
- Charge nurse
- Medication nurse
- Staff nurse
- Assessment nurse

8. Have you ever been employed in a health care setting?

- Yes
- No

9. If you answered “Yes” to the question above, did you assist with the delivery of patient care?

- Yes
- No

10. Do you have previous experience caring for patients with symptoms similar to those encountered during today’s high-fidelity simulation activity?

- Yes
- No

### Learner Satisfaction and Self- Confidence in Learning

**Instructions:** This questionnaire is a series of statements about your personal attitudes about the instruction you receive during your simulation activity. Each item represents a statement about your attitude toward your satisfaction with learning and self-confidence in obtaining the instruction you need. There are no right or wrong answers. You will probably agree with some of the statements and disagree with others. Please indicate your own personal feelings about each statement below by marking the numbers that best describe your attitude or beliefs. Please be truthful and describe your attitude as it really is, not what you would like for it to be. This is anonymous with the results being compiled as a group, not individually.

Mark:

- 1 = STRONGLY DISAGREE with the statement
- 2 = DISAGREE with the statement
- 3 = UNDECIDED - you neither agree or disagree with the statement
- 4 = AGREE with the statement
- 5 = STRONGLY AGREE with the statement

| <b>Satisfaction with Current Learning</b>  | <b>SD</b>               | <b>D</b>                | <b>UN</b>               | <b>A</b>                | <b>SA</b>               |
|--|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| 1. The teaching methods used in this simulation were helpful and effective.  | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 |
| 2. The simulation provided me with a variety of learning materials and activities to promote my learning the medical surgical curriculum.            | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 |
| 3. I enjoyed how my instructor taught the simulation.  | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 |
| 4. The teaching materials used in this simulation were motivating and helped me to learn.  | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 |
| 5. The way my instructor(s) taught the simulation was suitable to the way I learn.   | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 |
| <b>Self-confidence in Learning</b>   | <b>SD</b>               | <b>D</b>                | <b>UN</b>               | <b>A</b>                | <b>SA</b>               |
| 6. I am confident that I am mastering the content of the simulation activity that my instructors presented to me.                                    | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 |
| 7. I am confident that this simulation covered critical content necessary for the mastery of medical surgical curriculum.                            | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 |
| 8. I am confident that I am developing the skills and obtaining the required knowledge from this simulation to perform necessary tasks in a clinical | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 |
| 9. My instructors used helpful resources to teach the simulation.  | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 |
| 10. It is my responsibility as the student to learn what I need to know from this simulation activity.   | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 |
| 11. I know how to get help when I do not understand the concepts covered in the simulation.  | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 |
| 12. I know how to use simulation activities to learn critical aspects of these skills.   | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 |
| 13. It is the instructor's responsibility to tell me what I need to learn of the simulation activity content during class time..                     | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 |

## LASATER CLINICAL JUDGMENT RUBRIC

## Noticing and Interpreting

| <b>Effective NOTICING involves:</b>                  | <b>Exemplary</b>   | <b>Accomplished</b>  | <b>Developing</b>   | <b>Beginning</b>   |
|--|--|--|---|--|
| <b>Focused Observation</b>                           | Focuses observation appropriately; regularly observes and monitors a wide variety of objective and subjective data to uncover any useful information   | Regularly observes/monitors a variety of data, including both subjective and objective; most useful information is noticed, may miss the most subtle signs   | Attempts to monitor a variety of subjective and objective data, but is overwhelmed by the array of data; focuses on the most obvious data, missing some important information   | Confused by the clinical situation and the amount/type of data; observation is not organized and important data is missed, and/or assessment errors are made   |
| <b>Recognizing Deviations from Expected Patterns</b> | Recognizes subtle patterns and deviations from expected patterns in data and uses these to guide the assessment  | Recognizes most obvious patterns and deviations in data and uses these to continually assess   | Identifies obvious patterns and deviations, missing some important information; unsure how to continue the assessment   | Focuses on one thing at a time and misses most patterns/deviations from expectations; misses opportunities to refine the assessment  |
| <b>Information Seeking</b>                           | Assertively seeks information to plan intervention: carefully collects useful subjective data from observing the client and from interacting with the client and family  | Actively seeks subjective information about the client's situation from the client and family to support planning interventions; occasionally does not pursue important leads  | Makes limited efforts to seek additional information from the client/family; often seems not to know what information to seek and/or pursues unrelated information  | Is ineffective in seeking information; relies mostly on objective data; has difficulty interacting with the client and family and fails to collect important subjective data   |
| <b>Effective INTERPRETING involves:</b>              | <b>Exemplary</b>   | <b>Accomplished</b>  | <b>Developing</b>   | <b>Beginning</b>   |
| <b>Prioritizing Data</b>                             | Focuses on the most relevant and important data useful for explaining the client's condition   | Generally focuses on the most important data and seeks further relevant information, but also may try to attend to less pertinent data   | Makes an effort to prioritize data and focus on the most important, but also attends to less relevant/useful data   | Has difficulty focusing and appears not to know which data are most important to the diagnosis; attempts to attend to all available data   |
| <b>Making Sense of Data</b>                          | Even when facing complex, conflicting or confusing data, is able to (1) note and make sense of patterns in the client's data, (2) compare these with known patterns (from the nursing knowledge base, research, personal experience, and intuition), and (3) develop plans for interventions that can be justified in terms of their likelihood of success | In most situations, interprets the client's data patterns and compares with known patterns to develop an intervention plan and accompanying rationale; the exceptions are rare or complicated cases where it is appropriate to seek the guidance of a specialist or more experienced nurse | In simple or common/familiar situations, is able to compare the client's data patterns with those known and to develop/explain intervention plans; has difficulty, however, with even moderately difficult data/situations that are within the expectations for students, inappropriately requires advice or assistance | Even in simple of familiar/common situations has difficulty interpreting or making sense of data; has trouble distinguishing among competing explanations and appropriate interventions, requiring assistance both in diagnosing the problem and in developing an intervention |

**LASATER CLINICAL JUDGMENT RUBRIC**  
**Responding and Reflecting**

| <b>Effective RESPONDING involves:</b>        | <b>Exemplary</b>   | <b>Accomplished</b>   | <b>Developing</b>   | <b>Beginning</b>   |
|--|--|---|---|--|
| <b>Calm, Confident Manner</b>                | Assumes responsibility; delegates team assignments, assess the client and reassures them and their families  | Generally displays leadership and confidence, and is able to control/calm most situations; may show stress in particularly difficult or complex situations                      | Is tentative in the leader's role; reassures clients/families in routine and relatively simple situations, but becomes stressed and disorganized easily   | Except in simple and routine situations, is stressed and disorganized, lacks control, making clients and families anxious/less able to cooperate   |
| <b>Clear Communication</b>                   | Communicates effectively; explains interventions; calms/reassures clients and families; directs and involves team members, explaining and giving directions; checks for understanding                    | Generally communicates well; explains carefully to clients, gives clear directions to team; could be more effective in establishing rapport                                     | Shows some communication ability (e.g., giving directions); communication with clients/families/team members is only partly successful; displays caring but not competence                      | Has difficulty communicating; explanations are confusing, directions are unclear or contradictory, and clients/families are made confused/anxious, not reassured   |
| <b>Well-Planned Intervention/Flexibility</b> | Interventions are tailored for the individual client; monitors client progress closely and is able to adjust treatment as indicated by the client response   | Develops interventions based on relevant patient data; monitors progress regularly but does not expect to have to change treatments   | Develops interventions based on the most obvious data; monitors progress, but is unable to make adjustments based on the patient response   | Focuses on developing a single intervention addressing a likely solution, but it may be vague, confusing, and/or incomplete; some monitoring may occur   |
| <b>Being Skillful</b>                        | Shows mastery of necessary nursing skills  | Displays proficiency in the use of most nursing skills; could improve speed or accuracy   | Is hesitant or ineffective in utilizing nursing skills  | Is unable to select and/or perform the nursing skills  |
| <b>Effective REFLECTING involves:</b>        | <b>Exemplary</b>   | <b>Accomplished</b>   | <b>Developing</b>   | <b>Beginning</b>   |
| <b>Evaluation/Self-Analysis</b>              | Independently evaluates/analyzes personal clinical performance, noting decision points, elaborating alternatives and accurately evaluating choices against alternatives                                  | Evaluates/analyzes personal clinical performance with minimal prompting, primarily major events/decisions; key decision points are identified and alternatives are considered   | Even when prompted, briefly verbalizes the most obvious evaluations; has difficulty imagining alternative choices; is self-protective in evaluating personal choices                            | Even prompted evaluations are brief, cursory, and not used to improve performance; justifies personal decisions/choices without evaluating them  |
| <b>Commitment to Improvement</b>             | Demonstrates commitment to ongoing improvement: reflects on and critically evaluates nursing experiences; accurately identifies strengths/weaknesses and develops specific plans to eliminate weaknesses | Demonstrates a desire to improve nursing performance: reflects on and evaluates experiences; identifies strengths/weaknesses; could be more systematic in evaluating weaknesses | Demonstrates awareness of the need for ongoing improvement and makes some effort to learn from experience and improve performance but tends to state the obvious, and needs external evaluation | Appears uninterested in improving performance or unable to do so; rarely reflects; is uncritical of him/herself, or overly critical (given level of development); is unable to see flaws or need for improvement |

## APPENDIX J

### Qualtrics Survey

**Please enter your mother's six (6) digit birth date in the space below. For example, the date June 3, 1965 should be entered 06-03-65. You will enter this number each time you answer the survey following your simulation experiences.**

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**What is your sex/gender?**

- Male
- Female

**What is your age? (If you are <19 years - STOP HERE and contact the research assistant because study participation is not permitted for persons under 19 years of age.)**

- 19-22
- 23-27
- 28-32
- 33-37
- 37 and up

**How do you describe yourself? (Please, check the one option that best describes you)**

- American Indian or Alaska Native
- Hawaiian or Other Pacific Islander
- Black or African American
- Hispanic or Latino
- Non-Hispanic White

**What is your grade point average?**

- 3.5-4.0
- 3.0-3.49
- 2.5-2.99
- Below 2.5

**What was your role in the high-fidelity simulation?**

- Recorder
- Charge nurse
- Medication nurse
- Staff nurse
- Assessment nurse

**Have you ever been employed in a health care setting?**

- Yes
- No

**If you answered "Yes" to the question above, did you assist with the delivery of patient care?**

- Yes
- No

**Do you have previous experience caring for patients with symptoms similar to those encountered during today's high-fidelity simulation experience?**

- Yes
- No

**The teaching methods used in this simulation were helpful and effective.**

- Strongly Disagree
- Disagree
- Undecided
- Agree
- Strongly Agree

**The simulation provided me with a variety of learning materials and activities to promote my learning the medical surgical curriculum.**

- Strongly Disagree
- Disagree
- Undecided
- Agree
- Strongly Agree

**I enjoyed how my instructor taught the simulation.**

- Strongly Disagree
- Disagree
- Undecided
- Agree
- Strongly Agree

**The teaching materials used in this simulation were motivating and helped me learn.**

- Strongly Disagree
- Disagree
- Undecided
- Agree
- Strongly Agree

**The way my instructor(s) taught the simulation was suitable to the way I learn.**

- Strongly Disagree
- Disagree
- Undecided
- Agree
- Strongly Agree

**I am confident that I am mastering the content of the simulation activity that my instructors presented to me.**

- Strongly Disagree
- Disagree
- Undecided
- Agree
- Strongly Agree

**I am confident that this simulation covered critical content necessary for the mastery of medical surgical curriculum.**

- Strongly Disagree
- Disagree
- Undecided
- Agree
- Strongly Agree

**I am confident that I am developing the skills and obtaining the required knowledge from this simulation to perform necessary tasks in a clinical.**

- Strongly Disagree
- Disagree
- Undecided
- Agree
- Strongly Agree

**My instructors used helpful resources to teach the simulation.**

- Strongly Disagree
- Disagree
- Undecided
- Agree
- Strongly Agree

**It is my responsibility as the student to learn what I need to know from this simulation activity.**

- Strongly Disagree
- Disagree
- Undecided
- Agree
- Strongly Agree

**I know how to get help when I do not understand the concepts covered in the simulation.**

- Strongly Disagree
- Disagree
- Undecided
- Agree
- Strongly Agree

**I know how to use simulation activities to learn critical aspects of these skills**

- Strongly Disagree
- Disagree
- Undecided
- Agree
- Strongly Agree

**It is the instructor's responsibility to tell me what I need to learn of the simulation activity content during class time.**

- Strongly Disagree
- Disagree
- Undecided
- Agree
- Strongly Agree

**Think about your thought process and performance during the simulation experience. According to the Lasater Clinical Judgment Rubric, how would you rate your "noticing" skills in each of the following areas?**

|   | <u>Beginning</u>         | <u>Developing</u>        | <u>Accomplished</u>      | <u>Exemplary</u>         |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| Focused Observation                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Recognizing Deviations from Expected Patterns | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Information Seeking                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**According to the Lasater Clinical Judgment Rubric, how would you rate your "interpreting" skills in each of the following areas?**

|                      | <u>Beginning</u>         | <u>Developing</u>        | <u>Accomplished</u>      | <u>Exemplary</u>         |
|----------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Prioritizing Data    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Making Sense of Data | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**According to the Lasater Clinical Judgment Rubric, how do you rate your "responding" skills in each of the following areas?**

|                                       | <u>Beginning</u>         | <u>Developing</u>        | <u>Accomplished</u>      | <u>Exemplary</u>         |
|---------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Calm, Confident Manner                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Clear Communication                   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Well-Planned Intervention/Flexibility | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Being Skillful                        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**According to the Lasater Clinical Judgment Rubric, how do you rate your "reflecting" skills in each of the following areas?**

|                           | <u>Beginning</u>         | <u>Developing</u>        | <u>Accomplished</u>      | <u>Exemplary</u>         |
|---------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Evaluation/Self-Analysis  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Commitment to Improvement | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |