

COMPARING LASATER'S CLINICAL JUDGMENT RUBRIC SCORES ACROSS
FACULTY, SELF-ASSESSMENT, & OUTCOME SCORES

by

HALEY P. STRICKLAND

MARSHA H. ADAMS, COMMITTEE CHAIR
KARL HAMNER
MIKE JACOBS
AARON KUNTZ
ALICE MARCH

A DISSERTATION

Submitted in partial fulfillment of the requirements
for the degree of Doctor of Education in the Department of
Educational Leadership, Policy, and Technology Studies
in the Graduate School of
The University of Alabama

TUSCALOOSA, ALABAMA

2013

Copyright Haley P. Strickland 2013
ALL RIGHTS RESERVED

ABSTRACT

As more schools of nursing begin and/or continue to implement the use of human patient simulation, an objective evaluation tool needs to be used to measure nursing students' clinical judgment competency level. Assessment of nursing students' competency level is important because it identifies the students' strengths and weaknesses. This allows nurse educators to remediate content areas to make sure the student is clinically competent upon program completion and successful on the NCLEX-RN exam. The purpose of this study was to compare the accuracy of students' self-assessment of clinical judgment skills with faculty assessment of students' clinical judgment skills upon completion of a high-fidelity simulation experience. This study also compared the relationship between students' self-assessment and faculty assessment of clinical judgment competency levels during HPS and students' scores on a customized HESI nursing exam. Furthermore, the researcher investigated how high-fidelity simulation influences baccalaureate nursing student's clinical judgment competency level.

The researcher collected quantitative data using a pretest/post-test experimental design. Participants included students in the third semester of upper division in a baccalaureate nursing program. The findings indicated that there was a slightly significant positive correlation between the faculty's assessment of students' clinical judgment skills score and the students' self-assessment of clinical judgment skills score. Secondly, there was a significant positive correlation between the faculty's assessment of students' clinical judgment skills score and students' HESI scores (post intervention). Thirdly, there was no correlation between students' self-assessment score and HESI score (post-intervention). Lastly, the data revealed that the

experimental group scored significantly higher than the control group on the HESI exam (post-intervention). The results of this study indicate that students who undergo a cardiovascular HPS clinical experience perform significantly better on a customized cardiovascular parallel HESI exam than those students who do not receive a HPS experience.

DEDICATION

“I can do all things through Christ who strengthens me.”

Philippians 4:13

This dissertation is dedicated to my husband and children, because they are three of my greatest teachers. To my husband, Matt, I want to thank you for every moment we have shared together. I love you! To my children, Perkins and Ali Beth, you inspire me to be the best mother and teacher I can be. I hope and pray that you too will set your goals high and have the determination to reach for them. I love you both with all my heart and hope that one day your aspirations will become reality.

LIST OF ABBREVIATIONS OR SYMBOLS

AACN	American Association of Colleges of Nursing
BSN	Bachelor of Science in Nursing
CCNE	Commission on Collegiate Nursing Education
CINHAL	Cumulative Index of Nursing and Allied Health Literature
CJ	Clinical Judgment
CWID	Campus Wide Identification
<i>df</i>	Degrees of freedom
ELT	Experiential Learning Theory
HESI	Health and Environmental Sciences Institute
HPS	Human Patient Simulator
IOM	Institute of Medicine
IRB	Institutional Review Board
LCJR	Lasater Clinical Judgment Rubric
METI	Medical Education Technology Incorporated
<i>n</i>	Number in sample
NCLEX-RN	National Council Licensure Examination for Registered Nurses
NCSBN	National Council of State Boards of Nursing
NLN	National League for Nursing
<i>p</i>	Probability value
PI	Primary Investigator

PNCI	Program for Nursing Curriculum Integration
R	Squared multiple correlation coefficient
SCE	Simulated Clinical Experience
sig.	Significance
SPSS	Statistical Package for the Social Sciences
QSEN	Quality and Safety Education for Nursing
=	Equal to
%	Percentage
<	Less than

ACKNOWLEDGMENTS

I am truly blessed by the outpourings of love, support, and well wishes during the time of this research, and would therefore like to take this opportunity to thank those people who have been most influential in this research. First and foremost, I would like to thank my Lord and Savior Jesus Christ for giving me the strength and endurance to stay the course. I want to especially thank my wonderful family. To my loving husband, Matt thanks for your unwavering support, encouraging words, and for all the sacrifices you made so that I could accomplish this goal. I want to thank my children, Perkins and Ali Beth whose entire lives have revolved around their mother being in school and for understanding when mommy had to work on her schoolwork. I want to thank my parents for their love, support, and countless hours of babysitting so that I could complete this project. I love you all from the bottom of my heart and appreciate each of you for supporting me as I embarked on this doctoral journey.

Many thanks go to Dr. Marsha Adams for serving as chair of my dissertation committee. I am forever indebted for all the helpful insights and expertise she has shared with me, for guiding me each step of the way, and for spending so much of her sacred time reading or talking about my research. I would like to thank the other members of my doctoral committee: Dr. Alice March, Dr. Karl Hamner, Dr. Aaron Kuntz, and Dr. Michael Jacobs. Also, a special thanks to Dr. Rick Houser for sharing with me a mere ounce of his research methodology expertise. Thank you all for your time, guidance and support. It has been a pleasure working with you and with your nurturing I have grown both personally and professionally.

I am also thankful for the many friends who have been very much involved in this

process. I want to thank my critical sister, Michelle Cheshire, for knowing when to give me a push or a pull. I am so thankful that through this experience we have grown to know one another. You are a dear friend and may God bless you! I especially thank my UA CCN co-workers Sara, Andrea, Leslie, and Paige for making this wild and crazy ride somewhat more bearable and full of laughs. Lastly, I want to thank my closest friends and church family for all their love and prayers for me during this long and stressful process.

CONTENTS

ABSTRACT	ii
DEDICATION	iv
LIST OF ABBREVIATIONS AND SYMBOLS	v
ACKNOWLEDGMENTS	vii
LIST OF TABLES	xii
LIST OF FIGURES	xiii
CHAPTER ONE: INTRODUCTION	1
Problem Statement and Background	1
Significance of Problem	3
Purpose of Study	4
Theoretical Framework	5
Definition of Key Terms	9
Research Questions	10
Summary	11
CHAPTER TWO: REVIEW OF LITERATURE	12
Nursing Education	13
Simulation in Nursing Education	13
Benefits and Challenges of Utilizing Human Patient Simulation	14
Effect of Simulation on Development of Clinical Judgment	20
Summary	22

CHAPTER THREE: METHODOLOGY.....	23
Design.....	24
Sample.....	28
Setting.....	29
Recruitment.....	29
Instrumentation.....	30
Data Collection.....	34
Data Analysis.....	36
Summary.....	36
CHAPTER FOUR: RESULTS.....	38
Demographic Data.....	38
Findings.....	40
Summary.....	45
CHAPTER FIVE: DISCUSSION, IMPLICATIONS, AND RECOMMENDATIONS.....	47
Significant Findings.....	48
Discussion.....	51
Implications.....	55
Limitations.....	57
Recommendations for Future Research.....	57
Conclusion.....	58
REFERENCES.....	59
APPENDICES.....	63
A: Lasater Clinical Judgment Rubric.....	63

B:	Elsevier/HESI Educational Research Project Agreement.....	65
C:	Lasater Clinical Judgment Rubric Score Sheet.....	66
D:	Informed Consent.....	67
E:	Recruitment Script.....	70
F:	IRB Approval.....	74

LIST OF TABLES

3.1	Instruments of Measurement and Research Questions	30
3.2	Research Questions and Method of Analysis	36
4.1	Demographic Characteristics of Participants.....	39
4.2	Correlation between Faculty Assessment Score and Students' Self-Assessment Score..._	41
4.3	Correlation between Faculty Assessment Score and Students' HESI Scores	42
4.4	Correlation between Students' Self-Assessment Score and Students' HESI Scores.....	43
4.5	T-test for HESI Score Based on HPS Experience.....	44

LIST OF FIGURES

1.	Tanner's Clinical Judgment Model.....	9
2.	Order of events with adult health student participants.....	27

CHAPTER I

INTRODUCTION

Problem Statement and Background

Nurses in healthcare today care for patients with multifaceted issues and in the best interests of these patients, nurses often must consider a variety of conflicting and complex factors in choosing the best course of action. These choices or judgments must be made specific to the situation, as well as to the patient (Tanner, 2006). Clinical judgment is viewed as an essential skill for every nurse. Benner, Sutphen, Leonard, and Day (2010) refer to clinical judgment as the way in which nurses come to understand the problems, issues, or concerns of patients, to focus on relevant information and to respond in a concerned and timely manner. The shortage of registered nurses in the United States today many times puts inexperienced, new graduates on the front lines of emergent and critical care situations with minimal experience in critical clinical decision-making which could be detrimental to the patients we strive to protect as nurses (Hauber, Cormier, & Whyte, 2010). Nursing programs throughout the country are challenged with the task to produce graduates who are proficient in making critical decisions regarding patient care in a rapidly changing, high-stakes environment. In order to increase the ability for novice graduates to engage in critical decision-making and to improve clinical competency, numerous nursing programs have integrated the use of human patient simulation (HPS) into nursing curriculum.

Pressure to increase enrollment combined with low-availability of clinical sites and a shortage of nurse educators may contribute to inadequate preparation for the “real world” of nursing. The new graduate nurse’s ability to provide safe, high-quality care can be contingent upon the ability to think, reason, and judge, which is often limited by lack of nursing experience.

It is important for nurse educators to prepare students to be competent when entering a constantly changing and fast-paced work environment. The Institute of Medicine's (IOM) (2010) report entitled, *The Future of Nursing*, states "Technology—such as that used in high-fidelity simulations—that fosters problem-solving and critical-thinking skills in nurses will be essential for nursing education to produce sufficient numbers of competent, well-educated nurses" (p.20).

Simulation with high-fidelity technology is an innovative and effective teaching strategy that can be utilized to address the continuity of educational experiences of nursing students. The term, "high-fidelity" implies that the human patient simulator (HPS) has the ability to speak, breathe, bleed, and perspire on cue (CAE Healthcare, 2012). This interactive learning method allows the nurse educator to focus on a specific content area and teach multiple learning objectives. The National Council of State Boards of Nursing (NCSBN) (2010) identifies increased use of learning technology and providing students more experiential learning opportunities as trends in nursing education. Both of these goals can be achieved with the implementation of high-fidelity simulation. The NCSBN is currently conducting a landmark, multi-site, three phase study of simulation use in prelicensure nursing programs throughout the country. Although Phase II and Phase III are still underway, the results of Phase I indicate that simulation is increasingly adopted by nursing education programs (Kardong-Edgren, Willhaus, Bennett, & Hayden, 2012). Most nurse educators have embraced this teaching method as a way to promote critical thinking, develop clinical judgment, and empower students. Besides "real-life" patient care, high-fidelity patient simulation is one of a few learning strategies that helps nursing students fully address the complexity of patient problems or responses (Lasater, 2007).

Significance of Problem

A critical focus for nursing education in the 21st century is patient safety. The education and experience of the nurse directly affects the safety and quality of patient care (IOM, 2010). This is partially because nurses manage patient care at the point of service, where direct patient contact creates the potential for powerful therapeutic impact. This, however, also introduces great risk for active errors leading to patient harm (DeBourgh & Prion, 2011). Novice nursing students have not yet had the opportunity to develop clinical judgment skills and an awareness of patient risk. They also lack experience and responsibility in the nursing role as the primary advocate for patient safety. Students' opportunity to gain experience is often times restricted in the nursing student role, especially if a patient experiences an acute event when there is the need for prompt action by experienced nurses to ensure patient safety. Traynor, et al. (2010) states, "Students often find themselves on the periphery of the very experience that could provide them with necessary insights, understanding and skills" (p.1422). Management and involvement in the decision-making process in the clinical setting is reserved for licensed nurses. How then is learning through observation beneficial for nursing students?

A major role of nurse educators is to facilitate learning and evaluate skills and competencies that prelicensure students need to become a competent, safe practicing nurse. This requires the educator to promote and evaluate the development of clinical judgment skills. Clinical judgment skills are vital to practice as a professional nurse and will only be achieved if students are able to practice, engage in problem solving, and develop confidence and proficiency without causing patient harm (Reilly & Spratt, 2007). A study by Ironside, Jefferies, and Martin (2009) demonstrated that immersing students in a simulated experience "increases the

achievement and patient safety competencies” as outlined by the Quality and Safety Education for Nursing (QSEN) initiative, which began in 2005 (p.333).

Simulation, therefore, is an important solution to the challenges of patient safety education, development of clinical judgment skills, and nursing practice. Even though HPS is more visible in nursing education than ever before and is used as a tool to improve the proficiency of student nurses, there is limited research on the evaluative process used to determine the students’ competency level during HPS clinical experiences (Sportsman, Schumaker, & Hamilton, 2011; Weaver, 2011). A standardized tool in nursing education to evaluate students’ clinical judgment skills can help nurse educators and student alike by providing clinical competency expectations in a common language to an increasingly diverse student population (Lasater, 2011). This study adds to the body of research on development and evaluation of nursing students’ clinical judgment competency levels during human patient simulation by utilizing the Lasater Clinical Judgment Rubric.

Purpose of Study

The purpose of this study was to compare the accuracy of students’ self-assessment of clinical judgment skills to faculty assessment of the students’ clinical judgment skills upon completion of a high-fidelity simulation experience by answering the following research question:

1. What is the relationship between the students’ self-assessment of clinical judgment skills and the faculty’s assessment of clinical judgment skills upon completion of a human patient simulation?

This research study also compared students' clinical judgment competency levels with the student's score on a customized HESI nursing exam by answering the following research questions:

2. What is the relationship between faculty's assessment of students' clinical judgment skills upon completion of a human patient simulation and students' content specific HESI (post intervention) exam probability scores?
3. What is the relationship between students' self-assessment of clinical judgment skills upon completion of a human patient simulation and students' content specific HESI (post intervention) exam probability scores?

This study further examined how high-fidelity simulation influences baccalaureate nursing student's clinical judgment competency level by answering the following research question:

4. How do students who experience a human patient simulated clinical experience perform on the content specific HESI (post intervention) versus those who do not receive high-fidelity clinical experience?

The results of this study have potential to impact nursing education; encourage utilization of human patient simulation as a teaching strategy to improve students' clinical judgment skills, and adoption of an effective method of evaluating nursing students' clinical judgment skills.

Theoretical Framework

The theoretical framework of experiential education fits very well with the use of high-fidelity simulation as an instructional method. Experiential education is a philosophy and teaching methodology in which educators intentionally engage learners in a direct experience and time of reflection in order to increase knowledge and develop skills. According to John Dewey, "the teacher should not be one to stand at the front of the room doling out bits of

information to be absorbed by passive students” (1938, p.35). A champion of experiential education, Dewey, proposed that education be centered on the value of experience. However, he believed that certain parameters had to be met for the experience to be educational. The two main factors he was referring to were the principles of continuity and interaction. Continuity refers to the fact that we, as humans, are affected by experience. The term interaction further explains how past experience interacts with present situations. Dewey argued that we learn something from every experience, whether positive or negative and the accumulation of these learned experiences greatly influence our future experiences.

David Kolb is the proponent of Experiential Learning Theory (ELT) and he grounded his theory in some of the educational principles made popular by John Dewey. Experiential learning directly involves students in a learning experience with the goal being for the students to gain new purposeful knowledge and increased retention of information. Kolb (1984) defines learning as “the process whereby knowledge is created through the transformation of experience” (p.38). Even the ancient Chinese philosopher, Confucius, believed somewhat in the theory of experiential learning by stating “tell me, and I will forget; show me, and I may remember; involve me, and I will understand” (Confucius circa, 450 BC). The ELT is a cyclical model of learning that consists of four stages: concrete experience (DO), reflective observation (OBSERVE), abstract conceptualization (THINK), and active experimentation (PLAN). As a student progresses through Kolb’s ELT model, the learning process often begins with a person carrying out a particular action and then reflecting on the effect of their action. Upon reflection, the student will be able to understand the consequence of their actions. This is beneficial because it allows the student to recognize the anticipated outcome for the situation if the same action was replicated in similar circumstances. The ELT model, therefore, validates how past experiences

influence our future decision making. Kolb (1984) states that in order for learning to be effective, students must be involved in all four stages of the model but can enter the cycle at any stage; the model may be approached as a continuous spiral to promote life-long learning. By evolving through the stages of the model of experiential learning, students will have a direct encounter with the learning content rather than merely thinking about the words on a page, or only contemplating the possibility of what action they might take.

A prime example of experiential learning exists with the use of high-fidelity simulation. Simulation, as an educational learning technology, is aligned with the cyclical ELT model by requiring the student to be an active participant in a simulated scenario, reflect back on the simulated experience, think about strengths and weaknesses recognized during the experience, and plan for future experiences accordingly. The experience the students gain during simulation helps them connect the dots between theory content and actual nursing practice (Dillard, et al., 2009). McCaughey & Traynor (2010) revealed that nursing students within their study believed that the experience they had with high-fidelity simulation “enhanced the safety of their practice” (p.827). Kolb’s model also incorporates multiple learning styles. This is advantageous when addressing a large group of diverse students with varying backgrounds and learning styles (Lisko & O’Dell, 2010). Utilizing simulation in nursing education may potentially increase the success rates of an increasingly diverse student population.

Benner’s (1984) model of skill acquisition, Novice to Expert, is a conceptual framework that can be combined with simulation to justify how student’s competency levels increase as students are involved in hands-on experiences. There are five levels of competency within this model and the differentiation between levels results from the attention, involvement, and the responsibility of the nursing student. The levels within this model include: novice, advanced

beginner, competent, proficiency, and expert. Benner believes first and foremost that theoretical knowledge informs practice. However, experience provides the milieu for theoretical knowledge. Through practice experiences nursing students can apply and incorporate theoretical knowledge with practical knowledge. This process will increase student's clinical judgment abilities, competency level, and skill acquisition (Benner, Sutphen, Leonard, & Day, 2010). High-fidelity simulations provide experiences where nursing students are immersed in the consequences of their decisions, without causing the patient harm. Therefore, these experiences will be helpful for advanced beginners to start making the transition to the competent level (Waldner & Olson, 2007).

Tanner's Clinical Judgment Model (2006) further builds upon Benner's model of Novice to Expert by describing the thought processes nurses use when faced with complex and conflicting situations. The Clinical Judgment Model (CJM) identifies four dimensions of clinical judgment: noticing, interpreting, responding, and reflecting. "Noticing" is defined as the initial grasp of the patient situation and also includes patient expectations. The nurses understanding of the situation and deciding on a course of action makes up the dimensions of "Interpreting" and "Responding." Lastly, "Reflection" completes the cyclical model. It focuses on the clinician reflecting on the actions taken during the clinical situation and development of clinical knowledge through experience to apply to future situations (Tanner, 2006).

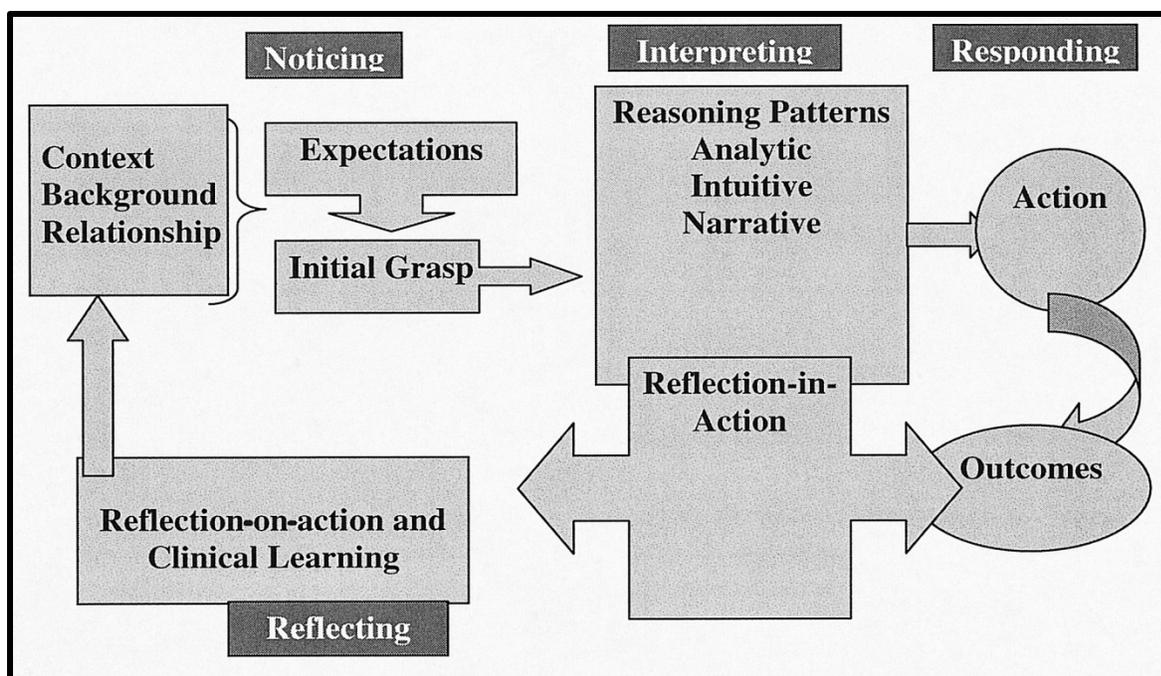


Figure 1. Tanner's Clinical Judgment Model.

The nurse or nursing student will hopefully increase the level of expertise by performing effectively in all four dimensions. By participating in high-fidelity simulations, students are able to build clinical judgment skills. Clinical experiences with HPS help advance and prepare novice nursing students to perform as competent and/or proficient nurses as they begin their careers in the multicomplex world of healthcare. This exemplifies how experiential education, based on the works of Dewey and modeled by Kolb, coupled with Benner's Model of Novice to Expert and Tanner's CLM provides a promising framework for high-fidelity simulation use in nursing education.

Definition of Key Terms

Clinical Judgment. In the nursing literature there are conflicting definitions of the terms clinical reasoning and clinical judgment. Some authors use the terms synonymously. In this study, the term clinical judgment is defined as the ability to recognize the relevant aspects of a clinical situation, interpret their meaning, and respond appropriately to provide optimal patient

outcomes (Tanner, 2006). For the purpose of this study, the clinical judgment skills of nursing students were rated by the primary investigator. The primary investigator awarded numerical values during the simulated cardiovascular scenario based on the students' performance. The total numerical value from the students' performance was then used to categorize students' into a beginning, developing, accomplished, or exemplary level of competence.

Human Patient Simulation. In this study, the term human patient simulation (HPS) is used synonymously with the term high-fidelity simulator. The outward appearance of the human patient simulator is very similar to the appearance of a human. A human patient simulator is “a sophisticated, computerized mannequin that can mimic real-life situations” (Jefferies & Rogers, 2007, p.28). Radhakrishnan, Roche, and Cunningham (2007) state HPS can “provide an interactive teaching and learning environment” (p.1). The human patient simulator has pulses, heart and lung sounds, and can speak. HPS is controlled by computer technology and respond physiologically to symptoms of disease conditions like a human being. During a simulated scenario, students are able to witness the deterioration or improvement of the simulator's condition (Lasater, 2007).

Research Questions

1. What is the relationship between the students' self-assessment of clinical judgment skills and the faculty's assessment of clinical judgment skills upon completion of a human patient simulation?
2. What is the relationship between faculty's assessment of students' clinical judgment skills upon completion of a human patient simulation and students' content specific HESI (post intervention) exam probability scores?

3. What is the relationship between students' self-assessment of clinical judgment skills upon completion of a human patient simulation and students' content specific HESI (post intervention) exam probability scores?
4. How do students who experience a human patient simulated clinical experience perform on the content specific HESI (post intervention) versus those who do not receive high-fidelity clinical experience?

Summary

Health care administrators are requiring nursing students to function at a higher performance level due to the increase in patients' acuity levels and the number of patients admitted with multiple illnesses. In response, nursing programs have incorporated HPS into the curricula in order to produce graduates who are proficient at the time of employment. Yet, there is minimal research as to how nurse educators objectively evaluate nursing students' competency level during a HPS clinical experience. A gap in the literature also exists in examining the relationship between competency level during a HPS clinical experience and success on nationally standardized nursing specialty exams. This study seeks to address these gaps by providing a vantage point for the improvement of research-based approaches to HPS utilization in nursing education.

CHAPTER II

REVIEW OF LITERATURE

Changes in nursing practice are occurring which necessitates enormous implications for nursing education. Nurses are charged with administering care for patients in diverse settings, ranging from ambulatory care to specialized acute hospital care settings. Since nurses are a patient's 'last line of defense' in a complex health care system, they must utilize a complex array of knowledge and skills to achieve the best possible patient outcome. New graduate nurses are expected to be prepared to "practice safely, accurately, and compassionately, in varied settings, where knowledge and innovation increase at an astonishing rate" (Benner, Sutphen, Leonard, & Day, 2010, p. 1). Advances in simulation technology now offer excellent adjuncts to "live" clinical education, reducing the barriers associated with limited experiences, limited clinical sites, and limited clinical faculty resources. Human patient simulation (HPS) technology provides efficient, safe, and effective alternatives to expand clinical teaching experiences in nursing education.

The literature search was primarily conducted using the Cumulative Index of Nursing and Allied Health Literature (CINHAL) and Pro Quest Nursing and Allied Health databases. This review of literature will address the use of simulation in nursing education as well as the various benefits of simulation. The impact of HPS on the following factors will be discussed: financial, student, learning environment, and nursing program. This review of literature will also address the effects of simulation on development of clinical judgment skills by nursing students. HPS is used in numerous ways in the education of nursing students. However, there is minimal research as to how nurse educators objectively evaluate nursing students' competency level during a HPS clinical experience. A gap in the literature also exists in examining the relationship

between competency level during a HPS clinical experience and success on nationally standardized nursing specialty exams. The review of literature provides rationale for why this study is timely and important.

Nursing Education

The Carnegie Report (2010) discusses four essential shifts in nursing education to tackle the ever present practice-education gap. One of the essential shifts addresses the sharp separation of clinical and classroom teaching to promote integration of classroom and clinical teaching. In this report, the sharp divide between classroom and clinical teaching was observed in all schools of nursing participating in the study (Benner, Sutphen, Leonard, & Day, 2010). Students also reported a significant difference between their experiences in classroom and clinical teaching. This separation does not support an integrated use of knowledge and skills that nursing practice demands. Utilizing integrative teaching helps the student incorporate knowledge, skills, and attitudes to adequately prepare the student to function in clinical situations. Among the professionals in the Carnegie Foundation for the Advancement of Teaching, nursing education stands out as having a uniquely strong emphasis on experiential learning. Utilizing experiential learning through the use of human patient simulation (HPS) technology as an integrative teaching strategy will effectively integrate nursing students' knowledge, skills, and attitudes by bridging the practice-education gap.

Simulation in Nursing Education

Experiential learning directly involves students in a learning experience with the outcome being for the students to obtain new knowledge and increased retention of information. Simulation, as an educational learning technology, is aligned with Kolb's cyclical Experiential Learning Theory (ELT) model by requiring the student to be an active participant in a simulated

scenario, reflect back on the simulated experience, think about strengths and weaknesses recognized during the experience, and plan for future experiences accordingly. The experience the students gain during simulation helps them to connect classroom teaching to actual nursing practice (Benner, Sutphen, Leonard, and Day, 2010; Dillard, et al., 2009).

Kolb's model also incorporates multiple learning style which is advantageous when addressing a large group of diverse students with varying backgrounds and learning styles (Lisko & O'Dell, 2010). Utilizing simulation in nursing education may potentially increase the success rates of an increasingly diverse student population. High-fidelity simulations provide experiences where nursing students are immersed in the consequences of their decisions, without causing the patient harm. These experiences, therefore, will be helpful for advanced beginners to start making the transition to the competent level using Benner's Novice to Expert Model (Waldner & Olson, 2007).

Benefits and Challenges of Utilizing Human Patient Simulation

Many factors have to be taken into account when incorporating simulation into a teaching plan and/or curriculum. The impact of simulation on the following factors must be taken into account: financial, student, learning environment, and nursing program. Upon reviewing these factors, it will be clear that the benefits of using high-fidelity simulation in nursing education will significantly outweigh any barriers that may exist.

Financial impact

The biggest hurdle to overcome when incorporating simulation into the curriculum is cost. Depending on the manufacturer and features, the price of a single high-fidelity simulator can range in cost from approximately \$30,000 to \$200,000 (Durham & Alden, 2008). Additional expenses that need to be considered include the following: supplies to simulate the desired

learning environment, physical space to utilize the simulator and equipment, and general upkeep and maintenance. A study by McIntosh, et al. (2007) calculated that the set-up cost of a simulation center, which would house several simulators and include a control room, was an estimated \$875,000.

Although this seems outrageously expensive, there are ways to make its use more affordable. Nursing programs may secure funding for the simulator through their annual budget, private donations, special allocations, or grants. Schools of nursing may rent the simulator to various agencies to offset some of the costs. Another option for nursing programs with a low budget is to partner with other institutions or healthcare agencies to share the costs of the simulator. With the simulator located at a hospital, supplies and equipment needed to invoke the “realism” of the scenario would be readily available. Within a learning institution, multiple disciplines or programs could share the simulator cost. This option could also be of great benefit to the students who would gain the experience of practicing in a multidisciplinary environment.

Many schools of nursing are adding a simulation fee to tuition costs in clinical courses. These fees can range anywhere from \$200 to \$300 per course. However, if you take into consideration that the cost of a nursing textbook is relatively similar, then it is apparent that the benefit of simulation outweighs the cost. Petscavage, et al. (2011) performed a cost analysis and feasibility study of high fidelity simulation and concluded that the financial costs of implementation are low compared to the potential cost of morbidity associated with the life-threatening event of an acute adverse reaction. As reimbursement for healthcare agencies depends more and more on the quality of care provided, the investment of a simulator or simulation center in the long run proves to be cost-effective (Durham & Alden, 2008).

Student impact

Traditional students from Generation Y, otherwise known as the Millennial or Net Generation, have grown up in the era of the technology boom. Students are accustomed to rapid sensory stimulation as a result of computer use, the Internet, and simulated computer games and programs (Bland, Topping, & Wood, 2011). Students now have smartphones, come to class with laptops, and are fascinated with the use of technology. In education today, students expect to have “hands-on, rapidly paced challenges and modern tools to facilitate their learning” (Rothgeb, 2008, p.493). Simulation is an innovative and effective teaching and learning tool that fits perfectly into the rapidly changing world of nursing education and modern health care. It is only natural for nursing students to become more engaged in a learning activity when a technological education tool, such as high-fidelity simulation, is being incorporated into the picture. In a study by Reilly & Spratt (2007), students revealed an increase in engagement and motivation to learn during the simulation learning experience. Students in the study also reported that participation in the high-fidelity simulation scenario prompted them to think and motivated them to be inquisitive (Reilly & Spratt, 2007).

Simulation is an active learning strategy that is “student-centered” with the educator acting as a facilitator. This is an additional benefit related to the utilization of simulation in nursing education. High-fidelity simulation allows students to participate in an immersive, experiential learning activity that requires them to engage in the learning process. Students are transformed into active participants in a hands-on learning experience and are able “to witness the results of their actions in real time” (Durham & Alden, 2008, p.11). This type of student-centered learning focuses on the student and promotes a deeper form of learning than just the memorization of facts. Students are being held responsible for their learning and teachers are

resources and facilitators of learning. Utilizing simulation with this type of learning approach requires the student's participation in an active learning scenario. Students can work individually, as a team, or collaborate with students from other disciplines. They are given the ability to problem-solve, make decisions, and use critical thinking in a safe environment. During simulation students can perform procedures, administer medications and treatments, and visually observe clinical changes in the human patient simulator as a result of the care provided. Not only do students learn by having hands-on experience but they are able to evaluate themselves based on their performance to determine the strengths and weakness of their knowledge (Dillard, et al., 2009). This will hopefully highlight problem areas to review so they can become successful in nursing practice.

Learning scenarios that incorporate simulation also boost students' self-confidence and can reduce anxiety in the actual clinical setting. Reed, Lancaster, & Musser (2009) state schools of nursing can increase student self-confidence if they expand active learning opportunities, specifically high-fidelity simulation use in the nursing curriculum. In addition, as Smith and Roehers (2009) revealed, simulation improves not only student's confidence but also student satisfaction with the learning process. Students are clearly more satisfied with the use of simulation than other instructional modalities. There is also evidence that HFS experiences are important in enabling students to "connect the dots" between the theory to practice gap by applying theoretical learning in lecture to a simulated situation (Dillard, et al., 2009). Simulation is a way in which students can identify areas of weakness and/or gaps in their knowledge base. Nursing students can use their learning experience with simulation to improve and influence the future of nursing practice and healthcare.

Impact on the learning environment

Bland, Topping, and Wood (2011) believe that authentic learning occurs when strategies are used that enable conceptual knowledge to develop contextually in settings that reflect reality. Therefore, high-fidelity simulation can facilitate an authentic learning experience if the setting mimics the “real-world” environment. Nursing students learn more when they are involved in activities, like simulation, where they perform tasks that are similar to the everyday activities of professionals who work in the field of nursing. Just installing a simulator in a classroom or conference area is not sufficient. This limits the potential applications for which the device can be used. For that reason, many institutions have designed simulation centers to model a range of clinical settings, which is especially important for the conveyance of highly realistic scenarios (Flanagan, et al., 2004). These simulated learning environments can be used to capture the full complexity of the real clinical care area. Situations including issues relating to medical equipment malfunction and the nuances associated with working with multiple personnel can be incorporated into learning situations. Typically, simulation centers provide a separate control room and a dedicated debriefing room where videotapes of the simulated session can be reviewed by the students as part of the reflective and feedback process.

A learning environment is not just the structural building where simulated clinical experiences take place. The learning environment also includes people, physical objects, social and cultural aspects (Sawyer, 2006). Participation in a simulated experience can be individually or with a group/team of students. Faculty may also be involved in the simulation as a family member, doctor, or practicing nurse. The simulation environment must be staged with objects normally found in the clinical setting. In home health simulated scenarios, the room should be transformed into a home setting to make the learning experience more realistic; therefore more

authentic. Lastly, it is most important to create a culture where students are given the ability to learn. Mistakes and mishaps are going to be made by the novice nursing student; however, it is vital that faculty don't inflect a negative mindset so students can be given the ability to learn from their experiences.

Impact on a nursing program

The use of high-fidelity simulation can be very beneficial to undergraduate nursing programs. Many nursing students seeking to enter the profession cannot be accommodated in nursing programs despite meeting all program admission requirements. American Association of Colleges of Nursing (AACN) data shows that 51,082 qualified applications were turned away from 503 entry-level baccalaureate nursing programs in 2011 and this number is expected to increase in the future (AACN, 2011). One primary barrier to accepting all qualified students at nursing colleges and universities continues to be the shortage of clinical placement sites. A recent study by Gates, Parr, and Hughen (2012) found that students who participate in high-fidelity simulation scored significantly higher on knowledge acquisition via examination than students who did not participate. The findings of this study add to the growing body of research that supports the use of high-fidelity simulation as an effective substitute for the traditional clinical experience. The integration of high-fidelity simulation into the nursing curriculum, therefore, will assist with the pressure to increase enrollment which will increase the number of new graduate nurses to help fulfill the demand of nurses related to the nursing shortage.

Simulation can also impact compliance with accreditation standards from the Commission on Collegiate Nursing Education (CCNE), a national accreditation agency by the U.S. Secretary of Education, which contributes to the improvement in public health. This agency seeks to ensure the quality and integrity of all levels of programs in nursing. CCNE encourages

nursing educational programs to introduce and use innovative teaching and learning strategies in the curriculum (CCNE, 2009). Nursing programs that received accreditation are responsible for making technology available to students for the improvement and enhancement of student learning. The curricula cannot remain the same in nursing schools as it was 20 years ago. The curricula must reflect the changing health care environment in order to prepare graduates to be competent in the clinical setting. Therefore, implementing the use of simulation in nursing education programs will support the pursuit to acquire academic excellence, a resilient nursing program and competent graduate nurses.

Effects of Simulation on Development of Clinical Judgment

Critical thinking is an essential element that should be incorporated in nursing curricula and is required by professional and regulatory bodies in nursing education. The American Association of Colleges of Nursing emphasizes critical thinking in their *Essentials of Baccalaureate Nursing*. Further, they state that course work and clinical experiences should provide and incorporate the use of clinical judgment and decision-making skills (AACN, 2008). Benner, Hughes, and Sutphen (2008) state “the growing body of research, patient acuity, and complexity of care demand higher-order thinking skills” (p.2). High-fidelity simulations in nursing education are powerful teaching tools because they integrate a clinical experience with the students’ knowledge base and this stimulates critical thinking. This demonstrates how critical thinking is a building block to clinical reasoning.

Clinical judgment is a process in which experience and knowledge are applied to a situation to achieve the best possible patient outcome (Benner, Hughes, & Sutphen, 2008). This process involves both inductive and deductive cognition. Clinical reasoning is a practice-based form of reasoning that requires the ability to differentiate important information, relate

knowledge, and apply it to a patient situation. Simply put, clinical reasoning is putting together the pieces of the puzzle. Increasing and providing students with experiences that develop their clinical reasoning skills is essential in the nursing curriculum. Clinical judgment requires clinical reasoning and it will develop with nursing experiences. In nursing education we should be utilizing simulation to its full potential to cultivate students' clinical judgment skills.

Blum, Borglund, and Parcells (2010) performed a study hypothesizing students who experience simulation as a primary mode of learning nursing assessment and skills would receive higher competency ratings from faculty than students learning using traditional approaches. The framework was based on Tanner's Clinical Judgment Model. Lasater's Clinical Judgment Rubric (LCJR) quantified the development of clinical judgment in nursing students. A quasi-experimental design was used within the context of a health assessment and skills course. The study's findings conclude that simulated approaches to skills competency were significantly improved versus the traditional approach among the two groups of students.

Brannan, White, and Bezanson (2008) describe the benefits of simulation as being a way for students to improve clinical decision making, practice skills, and observe outcomes from clinical decisions. A prospective, quasi-experimental, pretest and post-test comparison group design was used. They use two instructional methods, simulation and traditional classroom lecture, to compare effectiveness on 107 junior-level nursing student's cognitive skills. Results suggest that use of simulation made a positive difference on student's cognitive skills.

DeBourgh and Prion (2011) performed a study that examined how experienced nurses use previous experiences and knowledge to predict the potential for risk and harm to their patients. Beginning nursing students have not yet had the opportunity to develop an awareness of patient risk or safety concerns because they lack clinical experience. A quasi-experimental, pre-

posttest study of 285 students enrolled in a prelicensure clinical nursing course was conducted to describe results of an innovative simulated learning experience that was focused on fall prevention. Results of the simulation suggest this instructional method provides students with knowledge and skills gains and challenges them with memorable experiential learning that they can apply to future clinical practice.

Summary

Human patient simulation has been integrated into nursing, anesthesia, and medical programs for many years. It has also been studied using a variety of methodologies with essentially the same affirmation. Most students and faculty deem HPS as a beneficial learning modality. Therefore, the use of HPS in nursing curriculum has intensified over the last several years. The benefits of HPS have been demonstrated in the nursing students' ability to improve skill acquisition, knowledge attainment, decision making ability, critical thinking skills and development of clinical judgment (Blum, Borglund, & Parcels, 2010; Brannan, White, Bezanson, 2008; DeBourgh & Prion, 2011; Gates, Parr, & Hughen, 2012; Powell-Laney & Hall, 2012). Although the benefits of HPS have been thoroughly examined, HPS has not been rigorously examined with regards to evaluation of nursing students' competency level during a HPS clinical experience or the relationship between competency level during a HPS clinical experience and success on nationally standardized nursing specialty exams (Lapkin, Fernandez, Levett-Jones, & Bellchambers, 2012).

CHAPTER III

METHODOLOGY

As more schools of nursing begin and/or continue to implement the use of human patient simulation, an objective evaluation tool needs to be used to measure nursing students' clinical judgment competency level. Assessment of nursing students' competency level is important because it identifies the students' strengths and weaknesses. This allows nurse educators to remediate content areas to make sure the student is clinically competent upon program completion and successful on the NCLEX-RN exam. Also, many schools of nursing measure competence using nursing specialty standardized exam scores as a program requirement. The nursing literature supports human patient simulation's improvement in students' clinical judgment skills; however, a gap exists in the literature on a standardized instrument used to effectively measure clinical judgment skills of nursing students. Additionally, minimal research has been performed which compares an instrument used to measure clinical judgment skills of nursing students and nursing students' performance on standardized exams.

The purpose of this study was to compare the accuracy of students' self-assessment of clinical judgment skills with faculty assessment of the students' clinical judgment skills upon completion of a high-fidelity simulation experience. This study also compared the relationship between students' self-assessment and faculty assessment of clinical judgment competency levels during HPS and students' scores on a customized HESI nursing exam. This study further examined how high-fidelity simulation influences baccalaureate nursing student's clinical judgment competency level. This was done by answering the following research questions:

1. What is the relationship between the students' self-assessment of clinical judgment skills and the faculty's assessment of clinical judgment skills upon completion of a human patient simulation?
2. What is the relationship between faculty's assessment of students' clinical judgment skills upon completion of a human patient simulation and students' content specific HESI (post intervention) exam probability scores?
3. What is the relationship between students' self-assessment of clinical judgment skills upon completion of a human patient simulation and students' content specific HESI (post intervention) exam probability scores?
4. How do students who experience a human patient simulated clinical experience perform on the content specific HESI (post intervention) versus those who do not receive high-fidelity clinical experience?

Design

This quantitative, pretest/post-test study was based on Tanner's (2006) Clinical Judgment Model (TCJM) and conducted using an experimental design. After providing informed consent, a group of students in the third semester of upper division in a baccalaureate nursing program voluntarily participated in a cardiovascular human patient simulated clinical experience. More specifically, these were traditional baccalaureate nursing students in an adult health course. The HPS was a simulated clinical experience (SCE) taken from the Program for Nursing Curriculum Integration (PNCI) developed by Medical Education Technology Incorporated (METI). The cardiovascular SCE was the intervention in this study. The SCE was designed specifically for use in nursing education and supported by evidence from nursing research including the Joint Commission's National Patient Safety Goals, Quality and Safety Education for Nurses (QSEN)

competencies, the Institute for Safe Medication Practices (ISMP), and the 2010 NCLEX test plan (CAE Healthcare, 2012).

The primary investigator examined the relationship between the students' self-assessment of clinical judgment skills and the faculty's assessment of clinical judgment skills upon completion of a cardiovascular human patient simulation. This was conducted by comparing the Lasater Clinical Judgment Rubric (LCJR) (APPENDIX A) completed by the primary investigator and LCJR completed by the nursing student. The students were given access to the LCJR and score sheet prior to the simulation experience by posting the documents online via the institution's learning management system. Two students at a time participated in the cardiovascular HPS experience and each student was evaluated by the primary investigator simultaneously.

In this study the primary investigator examined the relationship between the PI's assessment of students' clinical judgment skills upon completion of a cardiovascular HPS simulated clinical experience and students' content specific HESI (post intervention) exam probability scores. This was conducted by comparison of the LCJR by the primary investigator and the students' content specific HESI (post intervention) exam probability scores.

The primary investigator examined the relationship between students' assessment of their clinical judgment skills upon completion of a cardiovascular human patient simulation and students' content specific HESI (post intervention) exam probability scores. This was conducted by comparison of the LCJR by the students and the students' content specific HESI (post intervention) exam probability scores.

This study also explored the experiences of students participating in a cardiovascular HPS simulated clinical experience and how it affects students' performance on content specific

HESI (post intervention) exam probability scores versus the students who do not receive the cardiovascular HPS simulated clinical experience. This was examined by completion of a cardiovascular (content specific) HESI (pre-intervention) exam immediately following an adult health class on cardiovascular content. The HESI exam consisted of specific questions related to cardiovascular content provided previously by an adult health nursing instructor. The HESI exam details will be discussed further under instrumentation. Upon completion of this exam, the students were randomized into two groups: control or experimental. The experimental group participated in a HPS simulation clinical experience based on the cardiovascular content presented and reflected in the cardiovascular HESI exam. Two students at a time from the experimental group participated in the cardiovascular HPS simulated clinical experience and each student was also evaluated by the primary investigator simultaneously using the LCJR stated previously. Upon completion of the cardiovascular HPS simulated clinical experience by all members of the experimental group, the control and experimental groups then took a second cardiovascular HESI exam (post-intervention). HESI exam probability scores from both the control and experimental groups were analyzed to determine if participation in the cardiovascular HPS clinical experience had any effect on probability scores on the cardiovascular HESI exam (post intervention). To provide equitable learning experiences, the students in the control were allowed to participate in the HPS simulated clinical experience prior to completion of the course.

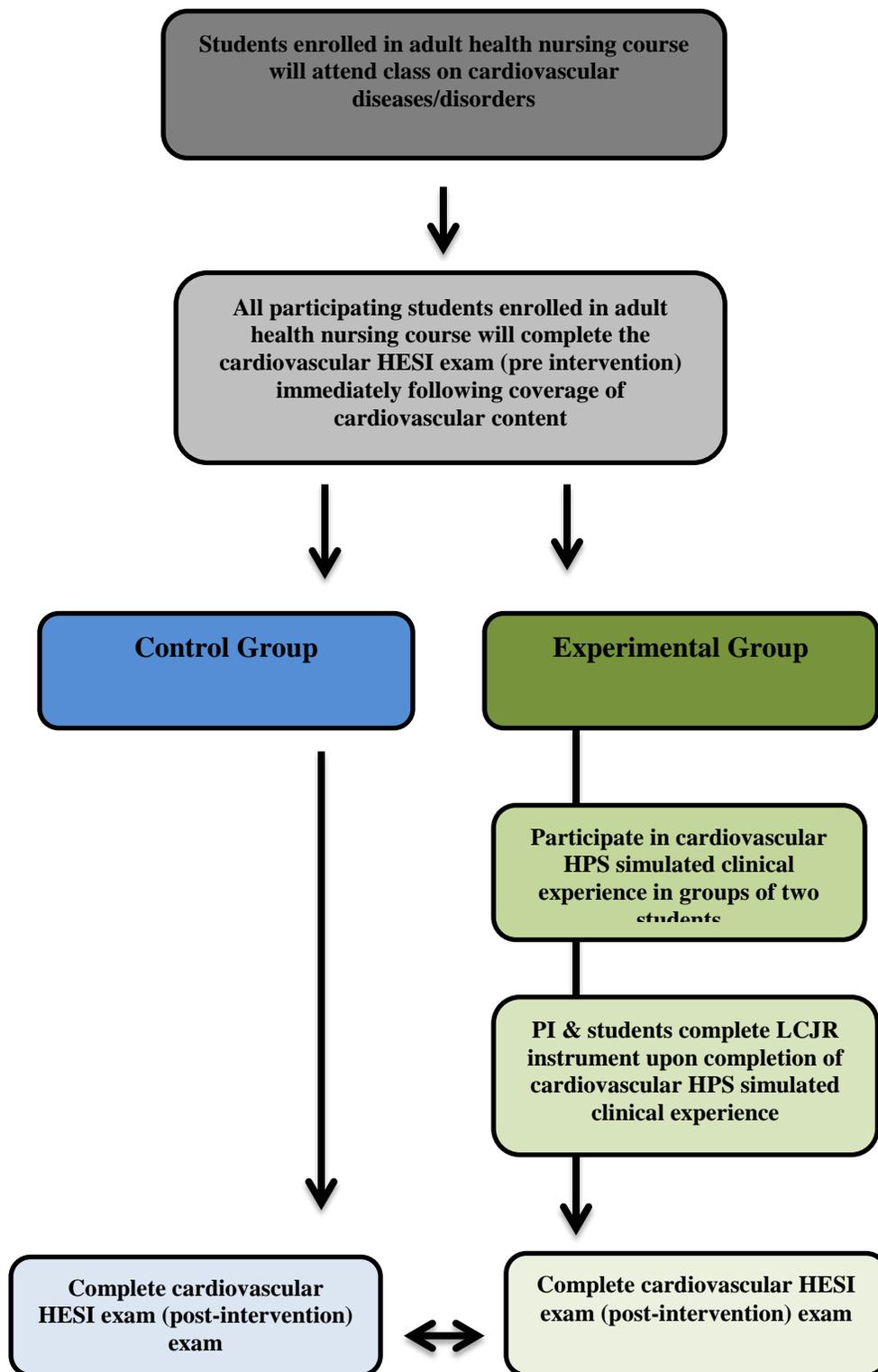


Figure 2. Order of events with adult health student participants

Sample

Participants in the study consisted of students in the third semester of upper division in a baccalaureate nursing program from a flagship public university. More specifically, students enrolled in the adult health nursing course. Exclusion criteria for the study was students who were repeating the adult health nursing course because these students had already been exposed to the cardiovascular information and/or the cardiovascular simulated clinical experience. This information was obtained by the primary investigator from the course leader of the adult health nursing course. This population was selected primarily because the students should have an understanding of the nursing process, basic psychomotor skills, and clinical decision making based on previous nursing coursework. The students have also had previous clinical experiences with HPS. The sample size consisted of 94 nursing students. The nursing students were randomly assigned to either the control or experimental group with the control group consisting of 46 nursing students and the experimental group consisting of 48 nursing students.

Gravetter and Wallnau (2009) state “researchers typically calculate power as a means of determining whether a research study is likely to be successful” (p.265). A power analysis for this study was performed using correlation and t-test analysis methods to determine how large a sample is needed to enable statistical judgments that are accurate and reliable. An estimated power analysis for correlation was 0.919 using SPSS Sample Power 3.0 for N=48 students. An estimated power analysis for t-test was 0.86 using SPSS Sample Power 3.0 for N=94 students. These estimates indicate the methods for analysis are appropriate and hold adequate statistical power (Gravetter & Wallnau, 2009).

Setting

The setting for the HPS simulated clinical experience was the Simulation Center for Clinical Excellence at The University of Alabama Capstone College of Nursing. The simulation center houses several human patient simulators in rooms modeled to mimic private hospital rooms. A standard iStan HPS was used for this study because student participants were in an adult health nursing course. Members of nursing faculty and staff have been trained to operate and control the computerized HPS during simulated clinical experiences.

Recruitment

The primary investigator (PI) received permission from the Dean of the College of Nursing and clinical course leader of third semester nursing students at the University of Alabama to recruit students enrolled in the adult health nursing course for the study. The PI gained approval from the Institutional Review Board (IRB) at the University of Alabama by completing the electronic research review process (Appendix F). The PI recruited students using face-to-face communication during the students' adult health nursing course (Appendix E). During this time, the PI informed the students' of the research project, study details (purpose, level of participation, time, potential risks and benefits), and extend an invitation to participate in the study. The informed consent form was distributed and the PI answered questions proposed by perspective participants (Appendix D). After all questions had been answered, the PI collected completed informed consent forms from potential participants in envelopes provided to maintain confidentiality. Incentive for participation in the study was one point on the students' final average with an alternate assignment available for those who were either unable or did not wish to participate in the research study.

Instrumentation

Data collection was accomplished by using two different instruments. The primary investigator completed the Lasater Clinical Judgment Rubric (LCJR) on students upon completion of the cardiovascular HPS experience. Students randomized into the experimental group completed (a) cardiovascular HESI exam (pre intervention), (b) self-assessment of performance upon completion of the cardiovascular HPS experience using the LCJR, and (c) cardiovascular HESI exam (post intervention). Students randomized into the control group completed (a) cardiovascular HESI exam (pre intervention) and (b) cardiovascular HESI exam (post intervention). Table 3.1 includes how data from each instrument was used to answer the research questions.

Table 3.1 *Instruments of Measurement and Research Questions*

Instrument of Measurement	Research Question
LCJR (PI and student)	What is the relationship between the students' self-assessment of clinical judgment skills and the faculty's assessment of clinical judgment skills upon completion of a human patient simulation?
LCJR (PI) and HESI exam (post intervention)	What is the relationship between faculty's assessment of students' clinical judgment skills upon completion of a human patient simulation and students' content specific HESI (post intervention) exam probability scores?
LCJR (student) and HESI exam (post intervention)	What is the relationship between students' self-assessment of clinical judgment skills upon completion of a human patient simulation and students' content specific HESI (post intervention) exam probability scores?
HESI exam (experimental group) and HESI exam (control group)	How do students who experience a human patient simulated clinical experience perform on the content specific HESI (post intervention) versus those who do not receive high-fidelity clinical experience?

Lasater's Clinical Judgment Rubric (LCJR)

The Lasater Clinical Judgment Rubric (LCJR) was used by the primary investigator to evaluate the students' clinical judgment skills by observing the simulated clinical experience. The LCJR (Appendix A) was developed based on Tanner's Clinical Judgment Model (TCJM). TCJM is divided into four levels of clinical judgment: Noticing, Interpreting, Responding, Reflecting. The LCJR further assesses subcategories for each level of clinical judgment. Consequently, the LCJR includes a total of 11 dimensions that assess for clinical judgment. The LCJR categorizes measurement options that range from Beginning, Developed, Accomplished, and Exemplary. Other researchers have reported successful use of the LCJR as a valid and reliable tool used to measure clinical judgment in the simulated learning environment (Blum, Borglund, & Parcels, 2010; Dillard et al., 2009; Lasater, 2011).

The primary investigator has had extensive training in and experience with the LCJR and evaluated students solely using the LCJR, therefore, eliminating the issue of inter-rater reliability. The students were given access to the LCJR and score sheet prior to the simulation experience by posting the documents online via the institution's learning management system, following Lasater's (2007) CJR study design. Scoring by the PI was conducted in person and by video playback software via METI vision. The PI and students completed the LCJR in each of the 11 dimensions according to a 4 point Likert-type scale: (1) beginning, (2) developing, (3) accomplished, (4) exemplary. During data analysis, student responses to all LCJR items were totaled to obtain an overall clinical judgment competency level for each participant. The primary investigator totaled responses to all LCJR as well to obtain an overall clinical judgment competency level for each participant. The minimum clinical judgment score possible was 11

(beginning competency level) and the maximum possible score was 44 (exemplary competency level). Note Appendix C for LCJR score sheet.

Health Educational Systems, Inc. (HESI) exam

Two parallel 30-item customized exams specifically based on cardiovascular content developed by HESI, a subsidiary of Elsevier Corporation, were used as pre and post-intervention assessment tools. On the second HESI exam (post-intervention) students received reliable equivalent test items that they had not seen previously, thus the term “parallel exam.” Utilization of parallel HESI exams avoids the limitation of the students’ memorization of test items but provides an equivalent test version. Students did not receive scores or feedback after first customized HESI exam to maintain validity and reliability of the research study. Upon completion of the second customized HESI exam (post intervention) students received score reports from HESI exams (pre and post), as well as feedback and rationales for questions answered incorrectly. Researchers have found customized HESI exams to be successful measures for measuring student achievement, benchmarking program outcomes, and a highly reliable predictor of performance on the National Council Licensure Examination for Registered Nurses (NCLEX-RN) (Young & Wilson, 2012). Therefore, HESI provides customized exams that are evidence-based.

Each test item on the customized HESI exam was selected by a nursing research specialist at HESI from the cardiovascular testing database using specific cardiovascular topics, provided by the PI, covered by the adult health faculty member during the students didactic experience on cardiovascular content. All test items being used had been previously used on national standardized HESI exams and had been deemed statistically reliable by the nursing research specialist via KR-20 scoring at testing cardiovascular knowledge. The KR-20 is a

statistical definition for reliability of the testing item/instrument. Before use in this study, the HESI nursing research specialist performed an analysis of both instruments to verify the reliability and validity of each exam. Once the study received approval, the HESI nursing research specialist at HESI created the tests, free of charge, with the primary investigators input based upon cardiovascular content presented to the nursing students. Note Appendix B for documentation from Elsevier demonstrating approval for this research and the graduate student agreement for use of the customized parallel HESI exams.

Students' scores were retrieved from the HESI scoring database by using Elsevier's Evolve Faculty Access site, which is password protected. All student information (names, scores, etc.) was kept strictly confidential. HESI exams are scored in two ways. The conversion score is a weighted percentage score that is calculated based on average difficulty of the exam along with average difficulty of the individual test items the student answered. The second score is a probability score which ranges from 0-1500. Students who score 900 and above are described by Elsevier as predicted to pass the NCLEX-RN with a predictive accuracy of 99.1% (Young & Wilson, 2012). All nine HESI exam validity studies have been found to be consistently accurate at predicting NCELX-RN success among students scoring at 900 and above with a predictive accuracy range from 96-99% (Elsevier, 2012). Consequently, as probability scores on the HESI exams decrease so does the NCLEX-RN pass rate.

This study explored the impact between students' clinical judgment competency level (rated by PI and self-assessment) and performance on content specific HESI (post intervention) exam probability scores. This was examined by comparing the student's self-assessment/primary investigator's assessment of clinical judgment skills using the LCJR upon completion of a cardiovascular HPS simulated clinical experience and students' scores on the cardiovascular

HESI exam (post intervention). The research study also explored the experiences of students' participating in a cardiovascular HPS simulated clinical experience (SCE) and how it affected students' performance on content specific HESI (post intervention) exam probability scores versus the students who did not receive the cardiovascular HPS simulated clinical experience. These were examined by analyzing the HESI exam (post intervention) probability scores using the score of 900 as a benchmark due to evidence of predictive accuracy.

Data Collection

Data collection took place after institutional review board approval was obtained. Students received written and verbal explanations of this study and were invited to participate. The PI obtained informed consent from each participant prior to the student participating in the research study. The primary investigator collected the consent forms in the envelopes provided to the potential participants. The envelopes were locked in a file drawer in the investigators office. Participants' campus wide identification (CWID) number, assigned by the University of Alabama, was used as their initial identifier. Once all data had been collected from the HESI exams and the LCJR instrument it was paired with the students' CWID and the investigator then de-identify the data by stripping the data set of the CWID to prevent any breach of confidentiality. The PI was responsible for handling and storing all study data. Only de-identified data will be shared.

Data collection occurred in three phases. First, all participating students in the study took a customized cardiovascular HESI exam (pre-intervention) based on cardiovascular content. All students in the adult health nursing course received the didactic experience on cardiovascular content by an adult health faculty prior to the customized HESI exam. The HESI cardiovascular exam was only for students participating in the research study and was not a course requirement.

The computerized exam had 30 questions and could have taken up to one hour to complete. The results of the standardized exam were retrieved from the Health Education Systems, Inc. (HESI) Faculty Access site, which is username and password protected.

Next, participants were randomly assigned to the control or experimental group. The experimental group participated in a human patient simulation clinical experience as part of the students' clinical assignment. The simulation was based on the cardiovascular content presented and reflected in the cardiovascular specialty HESI nursing exam. The students were given access to the LCJR and score sheet by posting the documents online via the institution's learning management system prior to the simulation experience. Two students at a time from the experimental group participated in the cardiovascular human patient simulation clinical experience and each student was evaluated by the PI simultaneously using the Lasater Clinical Judgment Rubric (LCJR). Upon completion of the human patient simulation, students in the experimental group completed a self-assessment using the same LCJR as the PI used and identify themselves using their CWID number. Participants in the control group were allowed to participate in a human patient simulation after the study but prior to completion of the course. Students in the control group did not complete the LCJR as part of this study.

Lastly, one week after completing the first customized HESI exam, all students participating in the study (control and experimental groups) took a second parallel-customized cardiovascular HESI exam (post-intervention) based on cardiovascular content. The HESI cardiovascular exam was only for students participating in the research study and was not a course requirement. The computerized exam had 30 questions and could have taken up to one hour to complete. The results of the standardized exam were retrieved in the same manner as mentioned above.

Data Analysis

Information collected from the LCJR's and the HESI exams were analyzed. Data for this study was completed by the primary investigator and nursing students. The primary investigator collected and compiled all data sets for analysis. Pearson correlation and t-test statistical methods were used to answer this studies research questions. Note Table 3.2 below for research questions and methodological analysis details.

Table 3.2 Research questions and method of analysis

Research Questions	Analysis
What is the relationship between the students' self-assessment of clinical judgment skills and the faculty's assessment of clinical judgment skills upon completion of a high-fidelity simulation?	Pearson Correlation
What is the relationship between faculty's assessment of students' clinical judgment skills upon completion of a high-fidelity simulation and students' content specific HESI (post-intervention) exam probability scores?	Pearson Correlation
What is the relationship between students' self-assessment of clinical judgment skills upon completion of a high-fidelity simulation and students' content specific HESI (post-intervention) exam probability scores?	Pearson Correlation
How do students who experience a high-fidelity simulated clinical experience perform on the content specific HESI (post intervention) versus those who do not receive a high-fidelity experience?	t-test

Summary

Nurse educators are using HPS as an innovative teaching modality to improve clinical judgment skills among nursing students. The nursing literature supports human patient simulation's improvement in students' clinical judgment skills, however, a gap exists in the literature on a standardized instrument used to effectively measure clinical judgment skills of

nursing students. An objective evaluation tool needs to be implemented by nurse educators to measure nursing students' clinical judgment competency level during HPS. Additionally, minimal research has been performed which compares an instrument used to measure clinical judgment skills of nursing students and nursing students' performance on standardized exams. This chapter has described the research design and methodology used to conduct this study which adds to the growing body of research that validates using the LCJR as a reliable tool used to measure clinical judgment competency level and HPS as an effective teaching modality for utilization in nursing education.

CHAPTER IV

RESULTS

The purpose of this study was to compare the accuracy of students' self-assessment of clinical judgment skills with faculty assessment of the students' clinical judgment skills upon completion of a high-fidelity simulation experience. This study also compared the relationship between students' self-assessment and faculty assessment of clinical judgment competency levels during HPS and students' scores on a customized HESI nursing exam. Furthermore, the researcher investigated how high-fidelity simulation influences baccalaureate nursing student's clinical judgment competency level. All data were entered into Statistical Package for the Social Sciences (SPSS) version 19 for data analysis. This chapter presents the results and the analysis of data obtained. A description of the participants' demographic characteristics will be presented followed by an examination of each research question and corresponding data analyses.

Demographic Data

The sample for this study was a convenience sample of third semester nursing students enrolled in Adult Health Nursing in the upper division of a baccalaureate nursing program from a flagship public university in the southeastern section of the United States. Enrollment in this course was 103 students ($n = 103$). Four students were excluded from the study because they were repeating the Adult Health Nursing course, but were given the option to complete a comparable alternative assignment to receive the incentive for participation in the research study. All students ($n = 99$) meeting study criteria were invited to participate on a voluntary basis. Five students were eligible to participate but were unable to do so due to various circumstances and were also given the alternative assignment option. A total of three students who did not

participate in the study completed the alternative assignment. All remaining students ($n = 94$) consented and participated in the research study.

The participants ($n = 94$) completed a routine simulation effectiveness survey, which includes demographic information and is required by the institution upon completion of any simulation experience. Demographic characteristics are presented in Table 4.1. The sample consisted of 90 females (97%) and 4 males (3%). Seventy-two students (77%) were between the ages of 18-21, fifteen students (16%) were between the ages of 22-25, six students (6%) were between the ages of 26-30, and one student (1%) was between the ages of 31-40. Eighty-three students (88%) were Caucasian, six (7%) African-American, one (1%) Hispanic and four (4%) participants did not identify their ethnicity.

Table 4.1

Demographic Characteristics of Participants ($n = 94$)

Descriptor	N	%
Gender		
Male	4	3
Female	90	97
Age		
18-21	72	77
22-25	15	16
26-30	6	6
31-40	1	1
Ethnicity		
African-American	6	7

Caucasian	83	88
Hispanic	1	1
Non-identified	4	4

Findings

Research Question 1: What is the relationship between the students' self-assessment of clinical judgment skills and the faculty's assessment of clinical judgment skills upon completion of a human patient simulation?

To address Research Question 1, participants were observed by the primary investigator while completing a cardiovascular HPS experience. The primary investigator and student participants completed the Lasater Clinical Judgment Rubric (LCJR) score sheet (Appendix C) upon completion of the cardiovascular HPS experience. The LCJR was used to categorize total clinical judgment scores into one of the four categories by adding together all responses to LCJR items: beginning (11-19), developing (20-28), accomplished (29-36), and exemplary (37-44). Data were entered into SPSS statistical software. Students scored themselves higher ($M = 33.48$, $SD = 3.719$) than faculty ($M = 31.19$, $SD = 3.220$) for total LCJR scores. The range for students' self-assessment LCJR scores was 27-43, while the range for faculty's LCJR scores was 24-38. A Pearson's correlation coefficient statistical analysis was performed to determine if a relationship exists between the faculty's assessment of students' clinical judgment skills score and the students' self-assessment of clinical judgment skills score. The data (Table 4.2) indicated that there was a slightly significant effect ($p = .030$), thus yielding a positive correlation ($r = .314$) between faculty's assessment scores and students' self-assessment scores. However, only 10% ($R^2 = 0.0985$) of the variance was attributed to HPS with the remaining 91% of variance

unaccounted for. Nevertheless, there was a positive relationship between faculty’s assessment of students’ clinical judgment skills score and the students’ self-assessment of clinical judgment skills score. Cronbach alpha reliability measures were analyzed with data from this study for the entire LCJR scale ($\alpha = 0.82$). Gravetter and Wallnau (2009) suggest that Cronbach alpha measures of 0.70 are acceptable and 0.80 are preferred to demonstrate reliability of a scale.

Table 4.2

Correlation between Faculty Assessment Score and Students’ Self-Assessment Score

		Faculty Assessment Score	Self-Assessment Score
Faculty Assessment Score	Pearson Correlation	1	.314*
	Sig. (2-tailed)		.030
	N	48	48
Self-Assessment Score	Pearson Correlation	.314*	1
	Sig. (2-tailed)	.030	
	N	48	48

*Correlation is significant at the 0.05 level (2-tailed).

Research Question 2: What is the relationship between faculty’s assessment of students’ clinical judgment skills upon completion of a human patient simulation and students’ content specific HESI (post intervention) exam probability scores?

To address Research Question 2, participants were observed and rated by the primary investigator during a cardiovascular HPS experience on clinical judgment skills as mentioned above. Following the HPS experience, students completed a customized cardiovascular parallel HESI exam (post-intervention). Data were entered into SPSS statistical software and a Pearson’s

correlation coefficient statistical analysis was performed to determine if a relationship exists between the faculty's assessment of students' clinical judgment skills score and the students' HESI score (post-intervention). The data (Table 4.3) indicated that there was a significant effect ($p = .001$), thus yielding a positive correlation ($r = .425$) between faculty's assessment scores and students' HESI scores. However, only 20% ($R^2 = 0.2043$) of the variance was attributed to HPS with the remaining 80% of variance unaccounted for. Nevertheless, there was a positive relationship between faculty assessment of students' clinical judgment skills score and the students' HESI score (post-intervention).

Table 4.3

Correlation between Faculty Assessment Score and Students' HESI Scores (post-intervention)

		Faculty Assessment Score	HESI Score (post intervention)
Faculty Assessment Score	Pearson Correlation	1	.425*
	Sig. (2-tailed)		.001
	N	48	48
HESI Score (post-intervention)	Pearson Correlation	.452*	1
	Sig. (2-tailed)	.001	
	N	48	48

*Correlation is significant at the 0.01 level (2-tailed).

Research Question 3: What is the relationship between students' self-assessment of clinical judgment skills upon completion of a human patient simulation and students' content specific HESI (post intervention) exam probability scores?

To address Research Question 3, participants rated themselves upon completion of a cardiovascular HPS experience on clinical judgment skills as mentioned previously. Following the HPS experience, students completed a customized cardiovascular parallel HESI exam (post-intervention) as mentioned above. Data were entered into SPSS statistical software and a Pearson’s correlation coefficient statistical analysis was performed to determine if a relationship exists between the students’ self-assessment of clinical judgment skills score and the students’ HESI score (post-intervention). The data (Table 4.4) indicated that there was no significant effect ($p = .244$) between students’ self-assessment scores and students’ HESI scores. In addition, there was not a correlation between students’ self-assessment score and HESI score (post-intervention).

Table 4.4

Correlation between Students’ Self-Assessment Score and Students’ HESI Scores (post-intervention)

		Self-Assessment Score	HESI Score (post intervention)
Self-Assessment Score	Pearson Correlation	1	.172
	Sig. (2-tailed)		.244
	N	48	48
HESI Score (post-intervention)	Pearson Correlation	.172	1
	Sig. (2-tailed)	.244	
	N	48	48

Research Question 4: How do students who experience a human patient simulated clinical experience perform on the content specific HESI (post intervention) versus those who do not receive high-fidelity clinical experience?

To address Research Question 4, participants were randomly assigned to control or experimental groups. Both groups of students took a customized cardiovascular HESI exam (pre-test). Students in the experimental group participated in a cardiovascular HPS experience. After all simulations were complete, both groups of students took a customized cardiovascular parallel HESI exam (post-intervention). Data were entered into SPSS statistical software and a t-test statistical analysis was performed to determine how students' who experience a human patient simulated experience perform on a content specific HESI exam (post-intervention) versus those who do not receive the HPS experience. The data (Table 4.5) indicated that the experimental group scored significantly higher, $t = 2.244$ ($df = 92$), ($p = .027$), with a mean score of 981.94 versus the control group that had a mean score of 899.78. The data indicated that students who experience a cardiovascular HPS experience perform significantly better on a customized cardiovascular parallel HESI exam than those students who do not receive a HPS experience.

Table 4.5

T-test for HESI Score Based on HPS Experience

		t	df	Sig. (2-tailed)	Mean Difference
HESI Score (post-intervention)	Equal variances assumed	2.244	92	.027	82.155
	Equal variances not assumed	2.241	90.831	.027	82.155

Summary

The researcher addressed four research questions in this study. Data from the first research question was examined to determine the relationship between the students' self-assessment of clinical judgment skills and the faculty's assessment of clinical judgment skills upon completion of a human patient simulation. A Pearson's correlation was performed and indicated a statistically significant positive relationship between faculty's assessment of students' clinical judgment skills score and the students' self-assessment of clinical judgment skills score. The second research question examined the relationship between faculty's assessment of students' clinical judgment skills upon completion of a human patient simulation and students' content specific HESI (post intervention) exam probability scores. A Pearson's correlation was performed and indicated a statistically significant positive relationship between faculty assessment of students' clinical judgment skills score and the students' HESI score (post-intervention). Data from the third research question examined the relationship between students' self-assessment of clinical judgment skills upon completion of a human patient simulation and students' content specific HESI (post intervention) exam probability scores. A Pearson's correlation was performed and concluded that there was no correlation between students' self-assessment scores and students' HESI scores. In addition, there was not a correlation between students' self-assessment score and HESI score (post-intervention). The fourth research question examined how students who experience a human patient simulated clinical experience perform on the content specific HESI (post intervention) versus those who do not receive high-fidelity clinical experience. The data indicated that students who experience a cardiovascular HPS experience perform significantly better on a customized cardiovascular parallel HESI exam than

those students who do not receive a HPS experience. Discussion of these findings, implications, limitations, and recommendations for future studies will be discussed in Chapter V.

CHAPTER V

DISCUSSION, IMPLICATIONS, LIMITATIONS, AND RECOMMENDATIONS

Nursing programs throughout the country aim to produce nursing graduates who are proficient in delivering safe nursing care. Accomplishing this goal has become more complex as the patients of today present with multiple complex illnesses. Nurses are expected to possess clinical judgment skills which allow them to consider a variety of conflicting and complex factors and choose the best course of action for the multiple patients in their care (Tanner, 2006; Benner et al., 2010). To respond to this pressure, numerous nursing programs have integrated the use of human patient simulation (HPS) into nursing curriculum. Simulation with high-fidelity technology is an innovative teaching strategy that allows nursing faculty opportunities to observe and evaluate students' use and development of clinical judgment skills (Jensen, 2013; Lasater, 2007; Oermann & Gaberson, 2006). However, there is limited research on the evaluative process of clinical judgment skills during HPS clinical experiences used to determine the students' competency level (Sportsman, Schumaker, & Hamilton, 2011; Weaver, 2011). A gap in the literature also exists in examining the relationship between competency level during a HPS clinical experience and success on nationally standardized nursing specialty exams. A standardized tool in nursing education to evaluate students' clinical judgment skills will allow nurse educators to compare students' clinical competency level with performance on nationally standardized nursing specialty exams. By utilizing this information, the knowledge to practice gap as we know it may become extinct.

The purpose of this study was to compare the accuracy of students' self-assessment of clinical judgment skills with faculty assessment of the students' clinical judgment skills upon completion of a high-fidelity simulation experience. This study also compared the relationship

between students' self-assessment and faculty assessment of clinical judgment competency levels during HPS and students' scores on a customized HESI nursing exam. Furthermore, the researcher investigated how high-fidelity simulation influences baccalaureate nursing student's clinical judgment competency level. In this chapter the researcher discusses significant findings, implications, limitations, and recommendations for future study.

Significant Findings

Research Question 1: What is the relationship between the students' self-assessment of clinical judgment skills and the faculty's assessment of clinical judgment skills upon completion of a human patient simulation?

A Pearson's correlation statistical analysis was performed to determine if a relationship exists between the faculty's assessment of students' clinical judgment skills score and the students' self-assessment of clinical judgment skills score. The data revealed that there was a significant positive correlation between the faculty's assessment of students' clinical judgment skills score and the students' self-assessment of clinical judgment skills score. The results from this study indicated that as the students' self-assessment of clinical judgment skills score increased the faculty's assessment of clinical judgment skills score increased as well. This result is consistent with the findings of Cato, Lasater, and Peoples (2009) who reported, "Often, students' self-assessments parallel the observations of the supervising clinical faculty" (p. 8). However, the average students' self-assessment score was higher than the primary investigators average score indicating that most students felt they were more accomplished than the PI's ratings for the actions performed during the simulation. These findings are equivalent with the findings of Jensen (2013) who reported that students scored themselves higher than faculty using the LCJR during multiple HPS clinical experiences.

Research Question 2: What is the relationship between faculty's assessment of students' clinical judgment skills upon completion of a human patient simulation and students' content specific HESI (post intervention) exam probability scores?

A Pearson's correlation statistical analysis was performed to determine if a relationship exists between the faculty's assessment of students' clinical judgment skills score and the students' HESI score (post-intervention). The data revealed that there was a significant positive correlation between the two. The results from this study indicated that higher the primary investigator rated the students' clinical judgment skills using the LCJR total score the higher the students' scored on the customized cardiovascular parallel HESI exam (post intervention). This finding continues to support the fact that "nurse educators are the most qualified people to evaluate what constitutes academic success" (Chasens, DePew, Goudreau, & Pierce, 2000, p. 267). It also demonstrates the effectiveness of using the LCJR as an evaluation tool for clinical performance much like we currently use standardized nursing exams to measure academic performance.

Research Question 3: What is the relationship between students' self-assessment of clinical judgment skills upon completion of a human patient simulation and students' content specific HESI (post intervention) exam probability scores?

A Pearson's correlation statistical analysis was performed to determine if a relationship exists between the students' self-assessment of clinical judgment skills score and the students' HESI score (post-intervention). In this research study, the data revealed that there was no correlation between students' self-assessment score and HESI score (post-intervention). This finding adds to a consistent, growing body of literature, suggesting that self-assessment is not an

effective method to determine an individual's own strengths and weaknesses (Baxter & Norman, 2011). However, there is no other literature available examine the relationship between self-assessment scores during HPS and nationally standardized nursing exams.

Research Question 4: How do students who experience a human patient simulated clinical experience perform on the content specific HESI (post intervention) versus those who do not receive high-fidelity clinical experience?

A t-test statistical analysis was performed to determine how students' who experience a human patient simulated experience perform on a content specific HESI exam (post-intervention) versus those who do not receive the HPS experience. The results of this study indicate that students who undergo a cardiovascular HPS clinical experience perform significantly better on a customized cardiovascular parallel HESI exam than those students who do not receive a HPS experience. The findings of this research are supported by Kolb's (1984) Experiential Learning Theory which describes learning as "the process whereby knowledge is created through the transformation of experience" (p.38).

Discussion

The goal of undergraduate nurse education is to adequately prepare nurses to meet the demands that are required currently in healthcare. Today, "nurses must make critical decisions associated with care of sicker, frailer patients and work with sophisticated, life-saving technology" (IOM, 2010). Often, this tremendous responsibility is thrust upon new nurses immediately after graduation; therefore, as Tanner (2006) states, it is essential for new nurses to have the ability to "think like a nurse" (p. 208). Nurse educators bear an even larger burden by being faced with the task of certifying students as competent in the clinical setting. These clinical evaluations are not as easy as evaluation of theory content which is normally assessed by

quizzes, examinations, papers, and projects. Evaluation in the clinical setting is more difficult because student performance is not solely a measure of ability to perform psychomotor skills. Walsh and Seldomridge (2005) state that clinical evaluation “is also a measure of knowledge, preparation, judgment, and ability to respond to a changing environment” (p. 162). Findings from this research support the use of the LCJR as a tool to evaluate nursing students’ clinical judgment skills and quantify competency levels upon completion of a HPS.

One of the goals of this study was to examine the relationship between the primary investigator’s and nursing students’ assessment of clinical judgment skills upon completion of a human patient simulation. Findings concluded that as the primary investigator’s clinical judgment skills score increased the students’ self-assessment of clinical judgment skills score increased as well. Few studies have focused on the relationship between students’ perception of clinical competency and performance. Brown and Chronister (2009) conducted a study that examined students’ competency in their ability to read ECG telemetry. Findings from students’ scores were compared to the students’ actual performance scores. Data revealed that there was a positive correlation in students’ perceived competence and their actual performance on the ECD evaluation. Data from this study compliment the findings from the current study that also discovered a positive correlation between self-assessment scores and performance scores.

However, the evidence also demonstrated that the students’ self-assessment score mean was higher than the evaluation score awarded by the primary investigator. Research indicates that while students rate themselves similarly to faculty during simulated clinical experiences, students’ tend to give themselves a higher rating than the faculty observing their performance (Cato, Lasater, & Peebles, 2009; Jensen, 2013). Nursing students’ overconfidence based on inflated assessments “may prove destructive to the new graduate and may also pose a threat to

patient safety” (Baxter & Norman, 2011, p. 2411). Therefore, direct observation and evaluation of students’ clinical judgment skills and competency level by nurse educators is crucial in producing proficient nurses into the healthcare workforce.

In this study, while there was a slight positive correlation between students’ self-assessment scores and the primary investigator’s scores, there were outliers that may have contributed to the likeness of the mean clinical judgment skills scores. Some participants who were weaker believed their abilities to be greater, whereas, a few participants who were strong viewed themselves as less capable than their actual performance. This coincides with a research study by Baxter and Norman (2011) which concluded that there is a lack of association between nursing students’ self-assessment and clinical performance; although, this study used the objective structured clinical examination (OSCE) as the clinical performance evaluation tool.

While an important part of nursing education, self-assessment should be used along with more objective evaluations to provide a more balanced view of students’ clinical performance (Jensen, 2013). Findings of this research also support the use of the LCJR to measure students’ perceptions of clinical judgment performance during HPS experiences. Tanner (2006) noted that a novice nurse develops clinical judgment through analytical reasoning. Based on Tanner’s (2006) Clinical Judgment Model, the LCJR provides a mean by which students can quantify their ability to notice, interpret, respond, and reflect during a HPS experience. The debriefing phase is an interactive follow-up discussion between the simulation facilitator and students enables the tailoring of constructive feedback based on the strengths and weaknesses of the students’ performance (Jeffries, 2005; Rudolph, Simon, Raemer, & Eppich, 2008). This is when students are encouraged to think critically and link theory to practice (Jeffries, 2005). The LCJR is a valuable tool to use during debriefing sessions. Utilizing the debriefing process upon completion

of HPS provides an additional evaluation method. The findings of this study indicate that HPS and the LCJR may be an effective self-assessment tool to help undergraduate nursing students progress from thinking like a student toward the goal of thinking like a nurse.

No other research studies were found linking LCJR competency scores to HESI exam performance scores. The findings of this study indicate a significant positive relationship between LCJR scores (by primary investigator) and HESI exam scores. Further research is needed in exploring the relationship between LCJR competency scores and scores on nationally standardized exams like HESI. In addition, this study concluded that there was no correlation between students' self-assessment LCJR scores and HESI exam scores. These findings demonstrate how nurse educators "are the most qualified people to evaluate what constitutes academic success" (Chasens, DePew, Goudreau, & Pierce, 2000, p. 267).

Additionally, the findings from this study are exciting and significant because they offer quantitative evidence that HPS may be effectively used as a teaching method in undergraduate nurse education to increase critical thinking and clinical judgment. HPS, as an educational learning technology, directly demonstrates Kolb's Experiential Learning Theory (ELT). Kolb's ELT provides a basis for the assimilation of theory into practice as learners form an understanding of concepts learned into the didactic settings which are then reinforced through hands-on experiences found in simulation (Lisko & O'Dell, 2010). This model requires the student to be an active participant in a simulated scenario, reflect back on the simulated experience, think about strengths and weaknesses recognized during the experience, and plan for future experiences accordingly. The experience the students gain during simulation helps them connect the dots between theory content and actual nursing practice (Dillard et al., 2009). This also describes how Benner's (1984) Novice to Expert model is united with simulation by

justifying how student's competency levels increase as students are involved in hands-on experiences. The findings of this research study support these claims by revealing that students who participate in a HPS experience perform better on a HESI exam. With additional supporting evidence that HESI benchmarks are a predictor of NCLEX-RN pass rates, nurse educators have confirmation that simulation can be beneficial when added to the curriculum. Further support may come from the NCSBN (2012) which is conducting a longitudinal study on the use of simulation in pre-licensure programs; the study will examine the role and outcome(s) of simulation. If the NCSBN study produces positive results, the results of the current study can provide additional support for the use of HPS in development of clinical judgment and nursing competency.

In addition to answering the research questions, another finding should be discussed. Although the nursing students were randomly assigned to groups, the control group scored higher on the HESI (pre-intervention) exam than the experimental group. Even though the experimental group scored significantly higher on the HESI (post-intervention) exam, it is important to note that the control group score dropped by almost 80 points. This leads the researcher to believe that there may be a link between HPS and retention of information. However, correlation between HPS and retention of information will require further study.

Implications

The findings of this researcher have several implications for nurse educators. Educators should consider using the LCJR as a means to evaluate student's clinical judgment skills and competency level during HPS experiences. This tool will allow educators to quantify students' clinical performance during HPS and also help them identify areas where they need improvement. The LCJR can also be used to help students self-reflect about their clinical

judgment performance during HPS. By utilizing this tool faculty and students alike will be able to evaluate HPS performance using a common language that will hopefully foster feedback and discussion. The LCJR, as an evaluative method for HPS, may serve as the basis for certifying students as clinically competent. Students' competency level during HPS, according to this study, is linked to student outcomes on HESI exam. Results from this study suggest that HPS allows students the ability to integrate theoretical information and nursing skills which will increase student outcome benchmarks on HESI exams. By being aware of this linkage, educators will be able to identify areas of difficulty for students and remediate content with them before they take these standardized exams and progress in the nursing curricula.

In addition, this study found an increase in HESI exam scores for students who participated in HPS versus those who did not, thus validating it as an effective pedagogical tool. By participating in high-fidelity simulations, students are able to build clinical judgment skills. Experiences with HPS help advance and prepare students to be proficient and successful as they begin their careers in the multicomplex world of healthcare. This teaching method exemplifies how experiential education, based on the works of Dewey and modeled by Kolb, coupled with Benner's Model of Novice to Expert and Tanner's CLM provides a promising framework for the use of HPS in nursing education. Undergraduate nursing programs and educators should be incorporating multiple HPS experiences throughout nursing curriculum to offer students the opportunity to develop an understanding of their role as a professional nurse, develop higher levels of decision-making abilities, and enhance clinical judgments impacting patient care, each of these leading to improved patient safety. These results reinforce the need for nurse educators to utilize HPS as an evidence-based teaching methodology.

These research findings also have important implications for nursing practice. It is important to realize that employers see clinical judgment as a developmental process. Upon graduation many students meet the minimum qualifications for entry into practice; however, this does not mean nursing graduates have mastered all aspects of clinical judgment. HPS experiences should not stop with nursing education in the academic realm. Employers of novice nurses should utilize HPS in orientation programs, clinical competencies, and beyond. Continuation of using HPS into practice may help bridge the gap between nursing education and nursing practice. In return, employers may help keep educators informed of strengths and weaknesses identified in new graduate nurses. Encouraging employers to take on a more active role may perhaps increase the clinical judgment of nurses in practice even more.

Limitations

It is important to note limitations of this study that may affect the generalizability of the results and considerations for future studies. One limitation is that the study was conducted using a relatively small convenience sample of subjects from a single university in the southeast United States. Demographic data from the sample pool revealed a homogeneous group of nursing students. The use of a different cohort of students from another university may reveal dissimilar results. In addition, students were asked to participate in the study while managing a full-time course load. Students may have experienced additional stress which could have affected their performance during the HPS or HESI exam score. Lastly, these results were based on one nursing content area and only examined student performance during HPS at one point in time. The use of more than one scenario and various nursing content areas may yield different results.

Recommendations for Future Research

After considering the results, implications, and limitations of the study, the researcher has identified areas for future research studies. First, replication of the study with a larger sample size, possibly including multiple sites, will produce a more diverse subject pool and increase the generalizability of the study. Future research studies utilizing HPS should explore using various nursing content areas. Replication of this study with an extended longitudinal design using various HPS scenarios and comparing student performance with HESI specialty exam outcomes should be examined. Beginning with first semester BSN students and continuing throughout the nursing curriculum would increase understanding of the development of clinical judgment. In addition, these students could ultimately be tracked and reevaluated using the LCJR during their first year post-graduation. This will investigate retention of clinical judgment and decision making skills over time and assist in successful transition into the healthcare workforce.

Conclusion

The use of HPS continues to intensify in nursing education curricula. Members of nursing faculty believe that HPS is an innovative teaching method that assists students with the development of clinical judgment skills. However, minimal research has been performed on the evaluative process of clinical judgment skills during HPS clinical experiences used to determine the students' competency level. A gap in the literature also exists in examining the relationship between nursing students' competency level during a HPS clinical experience and outcomes on nationally standardized nursing specialty exams. A slightly positive relationship between students' self-assessment and the researcher's assessment of clinical judgment skills was found following HPS experience. The findings from this study also showed a significant positive relationship between the researcher's assessment of students' clinical judgment skills score and

students' HESI scores. However, there was not a relationship shown in this study between the students' self-assessment of clinical judgment skills score and their performance on the HESI exam. Lastly, the findings of this study indicate that students who undergo a HPS clinical experience perform significantly better on a HESI exam than those students who do not receive a HPS clinical experience. These results continue to validate the use of HPS in nursing education.

References

- Abbott, A., Schwartz, M., Hercinger, M., Miller, C., & Foyt, M. (2008). Predictors of success on National Council Examination for Registered Nurses for accelerated baccalaureate nursing graduates. *Nurse Educator*, 33(1), 5-6.
- American Association of Colleges of Nursing (AACN). (2011). *Press release: New AACN data show significant enrollment increases in baccalaureate, master's, and doctoral nursing degree programs*. Retrieved on February 4, 2011 from <http://www.aacn.nche.edu/news/articles/2011/11enrolldata>.
- American Association of Colleges of Nursing (AACN). (2008). *The essentials of baccalaureate education for professional nursing practice*. Washington, DC: American Association of Colleges of Nursing.
- Benner, P. (1984). *From novice to expert, excellence and power in clinical nursing practice*, Menlo Park, CA: Addison-Wesley Publishing Company.
- Benner, P., Sutphen, M., Leonard, V., & Day, L. (2010). *Educating nurses: A call for radical transformation*. The Carnegie Foundation for the Advancement of Teaching. San Francisco: Jossey-Bass.
- Benner, P., Tanner, C., & Chelsa, C. (2009). *Expertise in nursing practice: Caring, clinical judgment, and ethics* (2nd ed.). New York, NY: Springer Publishing.
- Bland, A. J., Topping, A., & Wood, B.. (2011). A concept analysis of simulation as a learning strategy in the education of undergraduate nursing students. *Nurse Education Today*, 31, 664-670. Doi:10.1016/j.nedt.2010.10.013
- Blum, C., Borglund, S., & Parcells, D. (2010). High-fidelity nursing simulation: Impact on student self-confidence and clinical competence. *International Journal of Nursing Education Scholarship*, 7(1), 1-14. Doi: 10.2202/1548-923X.2035
- Brannan, J., White, A., & Bezanson, J. (2008). Simulator effects on cognitive skills and confidence levels. *Journal of Nursing Education*, 47(11), 495-500.
- CAE Healthcare. (2012). HPS: Human patient simulator. Retrieved on January 2, 2013 from https://caehealthcare.com/home/eng/product_services/product_details/hps-human-
- Commission on Collegiate Nursing Education (CCNE). (2009). Accreditation standards for baccalaureate and graduate degree nursing programs. Retrieved on February 4, 2012 from <http://apps.aacn.nche.edu/Accreditation/pdf/standards09.pdf>.
- DeBourgh, G. & Prion, S. (2011). Using simulation to teach prelicensure nursing students to minimize patient risk and harm. *Clinical Simulation in Nursing*, 7(2), e47-e56.

- Dillard, N., Sideras, S., Ryan, M., Carlton, K. H., Lasater, K., & Siktberg, L. (2009). A collaborative project to apply and evaluate the clinical judgment model through simulation. *Nursing Education Perspectives*, 30(2), 99-104.
- Durham, C. & Alden, K. (2008). Enhancing patient safety in nursing education through patient simulation. In R. Hughes (Ed.), *Patient safety and quality: An evidence-based handbook for nurses* (pp. 1-40). Rockville, MD: Agency for Healthcare Research and Quality (AHRQ). Retrieved from http://www.ahrq.gov/qual/nursesdbk/docs/DurhamC_EPSNE.pdf.
- Flanagan, B., Nestel, D., & Joseph, M. (2004). Making patient safety the focus: Crisis resource management in the undergraduate curriculum. *Medical Education*, 38(1), 56-66.
- Gates, M., Parr, M., & Hughen, J. (2012). Enhancing nursing knowledge using high-fidelity simulation. *The Journal of Nursing Education*, 51(1), 9-15.
- Gravetter, F. & Wallnau, L. (2009). *Statistics for the behavioral sciences* (8th ed.), Belmont, CA: Wadsworth, Cengage Learning.
- Hauber, R., Cormier, E., & Whyte, J. (2010). An exploration of the relationship between knowledge and performance-related variables in high-fidelity simulation: Designing instruction that promotes expertise in practice. *Nursing Education Perspectives*, 31(4), 242-246.
- Institute of Medicine National Research Council. (2010). *The Future of Nursing: Leading Change, Advancing Health*, Washington, DC: The National Academies Press.
- Ironside, P., Jeffries, P., & Martin, A. (2009). Fostering patient safety competencies using multiple-patient simulation experiences. *Nursing Outlook*, 57(6), 332-337.
- Lapkin, S., Fernandez, R., Levett-Jones, T., & Bellchambers, H. (2010). The effectiveness of using human patient simulation manikins in the teaching of clinical reasoning skills to undergraduate nursing students: A systematic review. *Clinical Simulation in Nursing*, 6(6), e207-e222.
- Lasater, K. (2011). Clinical judgment: The last frontier for evaluation. *Nursing Education in Practice*, 11, 86-92.
- Lasater, K. (2007). High fidelity simulation and the development of clinical judgment: Student experiences. *Journal of Nursing Education*, 46, 269-276.
- Lisko, S. & O'Dell, V. (2010). Integration of theory and practice: Experiential learning theory and nursing education. *Nursing Education Perspectives*, 31(2), 106-108.
- McCaughey, C. & Traynor, M. (2010). The role of simulation in nursing. *Nurse Education Today*, 30, 827-832.

- McIntosh, C., Macario, A., Flanagan, B. & Gaba, D.M. (2005). *Simulation: What does it really cost?* Poster session presented at the SimTech 2005 Healthcare Simulation Conference, Brisbane, Australia.
- National Council State Boards of Nursing (NCSBN). (2005). Clinical instruction in prelicensure programs. National Council of State Boards of Nursing Position Paper. Retrieved on January 28, 2012 from <https://www.ncsbn.org/index.htm>.
- Oermann, M., & Gaberson, K. (2006). *Evaluation and testing in nursing education (2nd ed.)*. Spring Publishing Company, New York: NY.
- Petscavage, J., Wang, C., Schopp, J., Paladin, A., Richardson, M., & Bush, W. (2011). Cost analysis and feasibility of high-fidelity simulation based radiology curriculum. *Academic Radiology*, 18(1), 107-112.
- Powell-Laney, S., Keen, C., & Hall, K. (2011). The use of human patient simulators to enhance clinical decision-making of nursing students. *Education for Health*, 25(1), 11-15.
- Reed, C., Lancaster, R., & Musser, D. (2009). Nursing leadership and management simulation: Creating complexity. *Clinical Simulation in Nursing*, 5, e17-e21.
- Reilly, A., & Spratt, C. (2007). The perceptions of undergraduate student nurses of high-fidelity simulation-based learning. *Nurse Education Today*, 27(6), 542-550.
- Rothgeb, M. (2008). Creating a nursing simulation laboratory: A literature review. *The Journal of Advanced Nursing*, 54(3), 489-494.
- Sawyer, R. (2006). *The Cambridge handbook of the learning sciences*, New York, NY: Cambridge University Press.
- Shepherd, I., Kelly, C., Skene, F., & White, K. (2007). Enhancing graduate nurses' health assessment knowledge and skills using low-fidelity adult human simulation. *Simulation in Healthcare*, 2(1), 16-24.
- Smith, S. & Roehers, C. (2009). High-fidelity simulation: Factors correlated with nursing student satisfaction and self-confidence. *Nursing Education Perspectives*, 30(2), 74-78.
- Sportsman, S., Schumacker, R., & Hamilton, P. (2011) Evaluating the impact of scenario-based high-fidelity patient simulation on academic metrics of student success. *Nursing Education Perspectives*, 32(4), 259-265.
- Tanner, C. (2006). Thinking life a nurse: A research based model of clinical judgment in nursing. *Journal of Nursing Education*, 45(6), 204-211.

- Traynor, M., Gallagher, A., Martin, L., & Smyth, S. (2010). From novice to expert: Using simulators to enhance practical skill. *British Journal of Nursing (BJN)*, 19(22), 1422-1426.
- Waldner, M. & Olson, J. (2007). Taking the patient to the classroom: Applying theoretical frameworks to simulation in nursing education. *International Journal of Nursing Education Scholarship*, 4(1), 1-14.
- Weaver, A. (2011). High-fidelity patient simulation in nursing education: An integrative review. *Nursing Education Perspectives*. 32(1), 37-40.
- Young, A. & Willson, P. (2012). Predicting NCLEX-RN success: The seventh validity study HESI exit exam. *CIN: Computers, Informatics, Nursing*, 30(1), 55-60.

APPENDIX A

LASATER CLINICAL JUDGMENT RUBRIC

Noticing and Interpreting

Effective NOTICING involves:	Exemplary	Accomplished	Developing	Beginning
Focused Observation	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.
Recognizing Deviations from Expected Patterns	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
Information Seeking	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
Effective INTERPRETING involves:	Exemplary	Accomplished	Developing	Beginning
Prioritizing Data	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
Making Sense of Data	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 see 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

© Developed by Kathie Lasater, Ed.D. (2007). Clinical judgment development: Using simulation to create a rubric. *Journal of Nursing Education*, 46, 496-503. January 2007

LASATER CLINICAL JUDGMENT RUBRIC

Responding and Reflecting

Effective RESPONDING involves:	Exemplary	Accomplished	Developing	Beginning
Calm, Confident Manner	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
Clear Communication	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, direction are unclear or contradictory, and clients/families are made confused/anxious, not reassured
Well-Planned Intervention/Flexibility	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
Being Skillful	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
Effective REFLECTING involves:	Exemplary	Accomplished	Developing	Beginning
Evaluation/Self-Analysis	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 evaluation; 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
Commitment to Improvement	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 B



Graduate Student Agreement to participate in Elsevier/HESI Educational Research Projects

Thank you for agreeing to participate in Elsevier/HESI-focused research to meet requirements for your graduate study course(s). Please review the Elsevier/HESI guidelines that pertain to educationally-focused research studies, and sign and return a copy of this form to us prior to handling any Elsevier/HESI data.

- (1) All data received by the graduate student for analysis must be maintained in a secure location for the duration of the student's involvement with this study.
- (2) The graduate student agrees to maintain the confidentiality of all individual scores identified within any data summary document.
- (3) The graduate student recognizes that reporting of Elsevier/HESI-focused research findings are described as aggregate findings only, which is a criterion of educational studies exempt from review of the institutional review boards (IRB) as recognized by the IRBs at most universities. Any reporting of Elsevier/HESI scores pertaining to individual students must be approved by the IRB prior to initiation of any Elsevier/HESI-related project.
- (4) Once the final analysis of the data is complete, the graduate student must provide electronic copies of all spreadsheets or other types of files generated from statistical software packages and/or word processing programs. Any electronic files stored on the hard drive(s) of students' computers must be destroyed once the data have been returned to Elsevier/HESI, and Elsevier/HESI has (1) confirmed receipt of returned files; and (2) determined that the files are uncorrupted, accessible on our computer systems, and complete.
- (5) The graduate student will receive recognition (depending on the level of involvement with the project) as a research assistant, co-author, or lead author on related manuscripts prepared for publication.

The title of my [] thesis [] dissertation is: HUMAN PATIENT SIMULATION AS AN EVALUATIVE METHOD FOR BACCALAUREATE NURSING STUDENTS' CLINICAL JUDGEMENT SKILLS

This agreement is for the timeframe January 2013 to December 2013.

I anticipate graduation from The University of Alabama on December 2013.

For any questions, contact:

Ainslie Nibert, PhD, RN, FAAN • Vice President • Review and Testing/HESI • Health Sciences
Office: 800.950.2728, ext. 6910 • Mobile: 832.675.1561 • a.nibert@elsevier.com

We are pleased that you chose Elsevier/HESI-focused research for completion of your course requirements. Thanks for participating, and we look forward to seeing your results!

APPENDIX C

Lasater Clinical Judgment Rubric Scoring Sheet

©Developed by Kathie Lasater, EdD; Based on Tanner’s Integrative Model of Clinical Judgment (2006)

Student Name:

Observation Date/Time:

Clinical Judgment Components	Observation Notes
<p><u>Noticing:</u></p> <ul style="list-style-type: none"> • Focused Observation: E A D B • Recognizing Deviations from Expected Patterns: E A D B • Information Seeking: E A D B 	
<p><u>Interpreting:</u></p> <ul style="list-style-type: none"> • Prioritizing Data: E A D B • Making Sense of Data: E A D B 	
<p><u>Responding:</u></p> <ul style="list-style-type: none"> • Calm, Confident Manner: E A D B • Clear Communication: E A D B • Well-Planned Intervention/Flexibility: E A D B • Being Skillful: E A D B 	
<p><u>Reflecting:</u></p> <ul style="list-style-type: none"> • Evaluation/Self-Analysis: E A D B • Commitment to Improvement: E A D B 	
<p><u>Summary Comments:</u></p>	

APPENDIX D

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 “Human Patient Simulation as an Evaluative Method for Baccalaureate Nursing Students’ Clinical Judgment Skills”. This study is being done by Haley Strickland, a doctoral student at the University of Alabama.

What is this study about?

Nursing schools use computerized human patient simulators, known as “high-fidelity simulators.” This helps teach students how to think critically and react like a nurse. These clinical judgment skills are essential skills for every nurse. This study wants to understand how simulation influences your clinical judgment. This study explores the relationship between your clinical judgment during a simulated clinical experience and your score on standardized nursing specialty exams.

Why is this study important?

This study is important to help nurse educators objectively evaluate nursing students’ performance and clinical judgment skills. This study is also important to establish a relationship between clinical judgment during a simulated clinical experience and scores on standardized nursing specialty exams.

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 junior nursing student at the University of Alabama. Additionally, you are enrolled in NUR 372 Adult Health.

How many people will be in this study?

The investigator is inviting all students enrolled in NUR 372 to take part in the study, unless you have taken this course before.

What will I be asked to do in this study?

If you agree to participate in this study, you will complete two (2) customized cardiovascular HESI exams. These exams are based on cardiovascular content presented to you in class by an adult health faculty member. You may be asked to participate in a simulated cardiovascular clinical experience using the human patient simulator. If you participate in the simulation, you will be asked to complete a survey after you finish the simulation.

How much time will I spend being in this study?

Each HESI exam could take up to one (1) hour to complete. The simulation experience is a course requirement so there will be no additional clinical time required. However, after the simulation you will complete a survey that will take about 10-15 minutes to complete.

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 receive money for your time. However, you will receive one point on your final average for participating 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 feel some stress while you participate in the human patient simulation and when you evaluate your performance after the experience. You may feel slight anxiety while you take the HESI exams.

What are the benefits of being in the study?

You will benefit from taking part in the study by reflecting on what you have learned. You may also identify 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. The primary investigator will collect the consent forms. They will be placed in a sealed envelope. The envelope will be locked in a file drawer in the investigator's office. Your campus wide identification (CWID) number will be used as your identifier when completing the survey in the study. Results of the HESI exams will be kept on the HESI exam database which is password protected.

How will my confidentiality be protected?

You will answer the survey in an isolated room. Paper copies of the information you provide will be kept in a locked file drawer in the investigator's 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 central Alabama".

What are the alternatives to being in the study?

A comparable alternative assignment will be available for one point on your final average for students not wanting to participate in the study.

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 grade in the course or your relationships with 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 at a later time, please call Haley Strickland at 205-361-2804. If you have questions or complaints about your rights as a research participant, call Mr. Carpantato 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. After you participate, you are encouraged to complete the survey for research participants located on the same website, or you may ask Haley Strickland for a copy of it. You may also send e-mail to 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 E

Recruitment Script to be read by Principal Investigator

Hello, my name is Haley Strickland. You know me as a member of the faculty here at the University of Alabama and the course leader for NUR 324 Fundamentals of Professional Nursing Practice; 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 immediately following your class on cardiovascular diseases/disorders. *(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 "Human Patient Simulation as an Evaluative Method for Baccalaureate Nursing Students' Clinical Judgment Skills". This study is being done by Haley Strickland, a doctoral student at the University of Alabama.

What is this study about?

Nursing schools use computerized human patient simulators, known as "high-fidelity simulators." This helps teach students how to think critically and react like a nurse. These clinical judgment skills are essential skills for every nurse. This study wants to understand how simulation influences your clinical judgment. This study explores the relationship between your clinical judgment during a simulated clinical experience and your score on standardized nursing specialty exams.

Why is this study important?

This study is important to help nurse educators objectively evaluate nursing students' performance and clinical judgment skills. This study is also important to establish a relationship between clinical judgment during a simulated clinical experience and scores on standardized nursing specialty exams.

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 junior nursing student at the University of Alabama. Additionally, you are enrolled in NUR 372 Adult Health.

How many people will be in this study?

The investigator is inviting all students enrolled in NUR 372 to take part in the study, unless you have taken this course before.

What will I be asked to do in this study?

If you agree to participate in this study, you will complete two (2) customized cardiovascular HESI exams. These exams are based on cardiovascular content presented to you in class by an adult health faculty member. You may be asked to participate in a simulated cardiovascular clinical experience using the human patient simulator. If you participate in the simulation, you will be asked to complete a survey after you finish the simulation.

How much time will I spend being in this study?

Each HESI exam could take up to one (1) hour to complete. The simulation experience is a course requirement so there will be no additional clinical time required. However, after the simulation you will complete a survey that will take about 10-15 minutes to complete.

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 receive money for your time. However, you will receive one point on your final average for participating 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 feel some stress while you participate in the human patient simulation and when you evaluate your performance after the experience. You may feel slight anxiety while you take the HESI exams.

What are the benefits of being in the study?

You will benefit from taking part in the study by reflecting on what you have learned. You may also identify 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. The primary investigator will collect the consent forms. They will be placed in a sealed envelope. The envelope will be locked in a file drawer in the investigator's office. Your campus wide identification (CWID) number will be used as your identifier when completing the survey in the study. Results of the HESI exams will be kept on the HESI exam database which is password protected.

How will my confidentiality be protected?

You will answer the survey in an isolated room. Paper copies of the information you provide will be kept in a locked file drawer in the investigator's 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 central Alabama”.

What are the alternatives to being in the study?

A comparable alternative assignment will be available for one point on your final average for students not wanting to participate in the study.

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 grade in the course or your relationships with 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 at a later time, please call Haley Strickland at 205-361-2804. If you have questions or complaints about your rights as a research participant, call Mr. Carpantato 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. After you participate, you are encouraged to complete the survey for research participants located on the same website, or you may ask Haley Strickland for a copy of it. You may also send e-mail to 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

(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. If you do not wish to participate you may still receive one point on your final average by completing a comparable alternative assignment that will be

assigned to you by your adult health course faculty. The procedures that are in place to protect your identity will be up-held.

Thank you for your time today. 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 number is 3047 at the Capstone College of Nursing.

APPENDIX F

April 5, 2013

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

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

Haley Strickland
Capstone College of Nursing
The University of Alabama
Box 870358

Re: IRB # 13-OR-111-ME: "Comparing Clinical Judgment Competency
Scores across Faculty, Self-Assessment, and Outcome Scores"

Dear Ms. Strickland,

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 approval will expire on April 4, 2014. If the study continues beyond that
date, you must complete the IRB Renewal Application. If you modify the
application, please complete the Modification of an Approved Protocol form.
Changes in this study cannot be initiated without IRB approval, except when
necessary to eliminate apparent immediate hazards to participants. When the
study closes, please complete the Request for Study Closure (Investigator)
form.

Please use reproductions of the IRB-stamped consent form.

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

Good luck with your research.

Sincerely,



358 Rose Administration Building
Box 870127
Tuscaloosa, Alabama 35487-0127
(205) 348-8461
FAX (205) 348-7189
TOLL FREE (877) 820-3066

Stuart Usdan
Chair, Non-Medical Institutional Review Board
The University of Alabama