

FACTORS CONTRIBUTING TO CLINICAL JUDGMENT DEVELOPMENT IN NURSING
STUDENTS DURING SIMULATION USING THE CREIGHTON COMPETENCY
EVALUATION INSTRUMENT

by

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It is imperative that nurse educators find inventive ways to advance nursing practice by developing a dynamic and divergent nursing workforce. Health care environments can be unpredictable and unsettling due to high acuity levels of patients. The development of excellent clinical judgment is necessary for nurses to meet the workforce demands that this type of environment poses. Nurse leaders report dissatisfaction with new graduates' ability to adequately perform competencies such as critical thinking. Nurse educators must establish approaches that teach, enforce, and evaluate the development of higher level thinking in nursing students.

This non-experimental descriptive correlational study explored factors that affect the development of clinical judgment in Bachelor of Science nursing students during a synthesis simulation. The Creighton Competency Evaluation Instrument (CCEI) was used to measure clinical judgment. Tanner's Clinical Judgment Model provided the theoretical foundation for this study. The clinical judgment of 108 BSN students in their fourth semester of a traditional nursing program was assessed by the researcher using the CCEI in the lab during a synthesis simulation. Students also completed a demographic questionnaire. Statistical methods used to

analyze the data included descriptive statistics, independent samples t-tests, one way analysis of variance, and Pearson product correlation.

Males were found to have significantly higher overall clinical judgment. Males also scored statistically higher on the communication subscale. There were no other statistical differences in demographics or the subscale scores of the CCEI. Work experience had no significant impact on total clinical judgment scores. Participants that reported working in healthcare scored significantly higher on the patient safety subscale of the CCEI than those reporting working but not in healthcare. The unemployed group did not differ significantly from the employed in healthcare or the employed not in healthcare groups on the patient safety subscale. Small correlations were found between HESI™ (E2) raw scores and CCEI total as well as communication and clinical judgment subscale scores.

The findings of this study contributed to the overall knowledge about clinical judgment and the CCEI as a means to evaluate clinical judgment. Application of findings could be used to increase the use of simulation and foster the development of clinical judgment in nursing students. Clinical judgment terminology should be a standard part of every nursing curriculum. Simulation, with an emphasis on clinical judgment, could be used to increase HESI™ (E2) scores of students thus better preparing them for NCLEX.

It is recommended that future studies use a longitudinal approach to measuring clinical judgment. This would provide more discernable data to evaluate the development of clinical judgment over time. It is also recommended that more research be done to establish the CCEI as a valid and reliable tool to measure clinical judgment as well as faculty perceptions of the CCEI.

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DEDICATION

To my parents who have given me tremendous opportunities throughout life to spread my wings. Thank you for your encouragement, support, and unconditional love. Mom, I miss you every day and know you have been the angel on my shoulder throughout this journey. I love you both.

To my husband, Frank for being the glue that has held our home and family together. You have been there for me during the major life changes we have endured as well as the smaller daily struggles we encountered during this process. I love you deeply.

To my children, David, Mary Beth, and Tobi, never give up on your dreams just because they seem unobtainable. The work it takes to make dreams come true and obtain your life goals is never easy but it is worth the effort. I am so very proud of each of you and love you.

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CHAPTER ONE: INTRODUCTION

Problem Statement

The mission of the National League for Nursing (NLN) is to “promote excellence in nursing education to build a strong and diverse nursing workforce to advance the health of our nation and the global community” (NLN, 2016a, para 1). There is a crucial need for change in nursing education to advance nursing practice and patient care. Nurses must be prepared to practice in healthcare settings that are filled with unpredictability, risks, and intricacies due to increasing patient acuity levels. These factors require nurses to develop exemplary clinical judgment (NLN, 2003; Lasater, 2007a). The Institute of Medicine (IOM) report *The Future of Nursing: Leading Change, Advancing Health* (2010) appeals to nursing to change the way students are being educated before entering the health care professions by expanding the emphasis from critical thinking to clinical judgment. Clinical judgment requires the nurse to form opinions and make decisions about situations based on knowledge and past experiences. Clinical judgment is formed continuously as nurses gain experience in the profession (Alfaro-Lafevre, 2017). Benner, Sutphen, Leonard, and Day (2009) advocate for nurse educators to develop innovative teaching and learning modalities that promote excellent nursing practice and clinical judgment skills. The NLN (2012) has supported the development of new teaching strategies since their Educational Research Priorities for 2012 to 2015 were published. These strategies included teaching approaches that affect patient care delivery systems, identifying the effectiveness of creative teaching-learning approaches to foster development of clinical reasoning, and identifying and evaluating technologies in the teaching of nursing decision-making skills “applied to patient care affecting individuals, families and communities at national and global levels” (NLN 2016b. p. 3). Since this publication, nursing faculty have incorporated

new pedagogies such as role-play, problem-based learning, case study, and simulation. While these strategies are being used in classrooms to enhance learning research to validate these new pedagogies must also be completed (Presti, 2016). The 2016-2019 NLN Education Research Priorities continue to address the need for innovative teaching approaches to “link student learning to sentinel health indicators to promote health, prevent disease, and manage the symptomatology of illness” they also include the need for educational research to connect nursing care with the science of nursing (NLN 2016b, p. 2).

A current shortage of nurses, an increasing demand on nurses, and the rising numbers of medical errors make it imperative for nursing schools to increase the number of students they are graduating while providing an education that is innovative and meets the complex needs of the healthcare system. Nurse educators must take steps to ensure nursing students develop the skills necessary to care for patients in today’s complex healthcare environment (IOM, 2010). The recent rise in enrollment of nursing students and the scarcity of clinical sites has brought attention to simulation and what it offers students as an adjunct to clinical education and the development of confidence, knowledge, and clinical judgment.

Significance and Background

While the economy has suffered major job losses in almost all industries in the last several years, healthcare has continued to grow. Registered nurses (RNs) will fill the majority of jobs in healthcare since they make up the largest portion of healthcare workers. In 2012, the Health Resources and Services Administration (HRSA) reported that nurses held 2.9 million healthcare jobs. Employment of RNs is projected to grow 16 percent from 2014 to 2024, much faster than the average for all occupations. The reasons for this growth include an increased emphasis on preventive care, growing rates of chronic conditions, and demand for healthcare

services from the baby-boom population as they live longer and more active lives. This increase equates to more than 400,000 new RN positions over ten years (Bureau of Labor Statistics, 2015). Between 2007 and 2008, there were more than 135,000 RN vacancies in the U.S. By 2025, the U.S. nursing shortage is expected to grow to 260,000 vacancies (Buerhaus, 2008).

In recent years there have been many reports about the number of errors that occur in the health care system (IOM, 2010; James, 2013). The IOM (2010) estimated that medical errors cost the United States approximately \$38 billion per year. An estimated 98,000 Americans die annually from medical errors. James (2013) argued that the IOM (2010) underestimated the number of deaths in the United States (US) due to medical errors. A literature review conducted by James (2013) between 2002 and 2008 estimated the number of deaths per year due to medical errors to be between 210,000 to more than 400,000. The wide gap in the estimate takes into consideration the numbers of clues that were possibly missed during the medical records review and the incompleteness of some of the medical records. One of the reasons for the wide differences in these numbers is due to the fact that the IOM(2010) used the Global Trigger Tool, an Institute of Healthcare Improvement tool to measure adverse events; this tool was thought to be limited in its search capability to identify errors of oversight, carelessness and neglect (James, 2013).

The nursing profession has acknowledged for many years that there is a gap between new graduate nurse competencies and the complex requirements of the healthcare system (Wangensteen, Johansson, & Nordström, 2008). Berkow, Virksta, Stewart and Conway (2009) state that a typical hospital's nursing staff consists of more than 10% new graduate nurses; this number is likely to grow with the aging nurse population. Wolff, Pesut, and Regan (2010)

identified the need for new graduate nurses to enter the workforce prepared to practice in a complicated and chaotic health care environment, as well as assume expanding roles. The healthcare system is dependent on academia to prepare new graduate nurses to meet competency standards at graduation. The development of sound clinical judgment in new graduate nurses plays an important role in meeting the demands of today's healthcare system (Tanner, 2006).

According to Berkow et al. (2009), in 2007 the New Graduate Nurse Performance Survey was conducted by the Nursing Executive Center, a program within The Advisory Board Company that provides best practice research to nursing executives. The purpose of this initiative was to identify the competencies that formed the preparation-practice gap and to then inform academia and hospital leaders to help them focus on bridging the gap. Nurse leaders were asked how satisfied they were with the performance of new nurse graduates on 36 competencies. All competencies were extracted with the assistance of many analysts and nurse experts. Competencies were then categorized into six subgroups. One subgroup was labeled critical thinking and consisted of six of the thirty-six competencies: recognizes when to ask for help, recognition of unsafe practice by self and others, decision-making based on the nursing process, recognition of changes in patient status, interpretation of assessment data, and ability to anticipate risk. Satisfaction of nurse leaders for graduate nurses meeting these competencies ranged from 11% to 35%. The Nursing Executive Center research pointed to the need for further studies to increase critical thinking competencies in student nurses to better prepare them for the work force. Based on the findings of the Nursing Executive Center, the population of interest in Berkow and colleagues' study on clinical judgment through simulation is baccalaureate of science in nursing (BSN) students (Berkow et al. 2009). As reported in a qualitative study by Myers et al. (2010), preceptors identified a problem with new graduate

nurses focusing on tasks rather than holistic care. Tanner (2006) identified ‘knowing the patient,’ which is embedded in holistic care, as a critical part of clinical judgment.

In 2008, the Carnegie Foundation published a report by Sullivan and Rosin stating that higher education must teach students to reason out what to do and take action rather than just recite facts. This report recommends using more case studies, which could be in the form of writing or simulation to develop the skills necessary for safe clinical judgment (Sullivan & Rosin, 2008).

Simulation

Simulation is not a new teaching strategy. Simulation has been a part of adult learning for decades. The space program has made use of simulation for training and testing. The nuclear power industry is another example of using simulation for training (Bradley, 2006; Dawson, 2006). The military has been at the forefront of simulation use in training. The aviation industry has developed high-fidelity flight simulation (Gantt, 2012). The desire to use simulation in health care is related to the notable reduction in aviation disasters due in part to simulation training (Grantcharov et. al, 2004). Simulation is an important tool in all these areas because the training is potentially dangerous and too costly if done entirely in the here and now. This is the key to why simulation works well for training and testing in the medical arena.

Medicine has been using simulation for centuries. The simplest forms of the mannequin that is associated with simulation today are the models of anatomical structures used to teach anatomy. The creation of “Resusci Anne” as the first sophisticated mannequin has led to a revolution in high-fidelity sophisticated mannequins (Bradley, 2006). Task trainers were discussed in the nursing literature as early as 1874. The first of these included arms and legs to learn bandage changing. These developed into pelvis models for catheter insertion, abdominal

models for stoma care, and arm models to learn skills related to intravenous therapy. The first full body trainer was Mrs. Chase introduced in 1910. In 1914, Mrs. Chase came with injection sites in her arms as well as the ability to practice procedures that involved the rectum and vagina (Nehring & Lashley, 2009).

These early trainers paved the way for today's mannequins that are capable of portraying life like characteristics. Simulators can now be categorized as low fidelity and high fidelity. Fidelity is "the degree that the object mimics reality" (Nehring & Lashley, 2009, p. 536). Low fidelity mannequins refer to those that are less life like than higher fidelity mannequins. With the advancement of mannequins into life like figures, simulation use in nursing education has become an integral part of educating students (Aebersold & Tschannen, 2013). Undergraduate curricula have used both low fidelity simulation (LFS) and high-fidelity simulation (HFS) to teach skills, critical thinking, and clinical judgment (Nehring & Lashley, 2009).

The purpose of simulation is "to replicate some or nearly all of the essential aspects of a clinical situation so that the situation may be more readily understood and managed when it occurs for real in clinical practice" (Morton, 1995, p. 76). Simulation is defined as a multitude of activities that are structured to represent situations in education and practice that allow participants to develop or enhance knowledge, skills, and attitudes or analyze and respond to realistic situations in a simulated environment or through an unfolding case study (Pilcher et al., 2012, p. 281). A scenario is an imagined or projected planned sequence of events occurring during a simulation. The clinical scenario provides the context for the simulation (Alinier, 2011; Aschenbrenner, Milgrom & Settles, 2012; Jeffries & Rogers, 2012; Waxman, 2010). Simulations in nursing education are created learning experiences based on clinical scenarios. Individuals or groups of individuals care for a patient using a holistic approach to meet the health

needs of the patient (Dearman, 2003). Simulation has been defined in nursing as “activities that mimic the reality of a clinical environment and are designed to demonstrate procedure, decision making and critical thinking techniques such as role playing and use of devices such as interactive video or mannequins” (Jeffries, 2005, p. 97). The purposes of simulation in nursing education are to support knowledge previously taught in the formal academic setting, teach new information, allow clinical practice in a safe environment, provide a non-threatening environment, evaluate the students’ knowledge and clinical “performance,” and to create an environment that stimulates the acquisition of knowledge (Jeffries, 2006, p. 162).

The NLN National Council of State Boards of Nursing (NCSBN) study conducted between fall 2011 and spring 2013 contributes the greatest evidence that substituting high-quality simulation experiences for up to half of clinical time is an effective way to insert simulation into nursing curriculum (Hayden, Smiley, Alexander, Kardong-Edgren, & Jeffries, 2014). In phase one of the study students had 10%, 25% and 50% of clinical time substituted with simulation. There were no significant differences among the three study groups’ end-of-program educational outcomes. There were also no statistical differences in the three groups’ comprehensive nursing knowledge, clinical competency ratings, or NCLEX pass rates. Phase two followed the participants to the workplace. Students that were exposed to the most simulation (50% of clinical time) reported feeling adequately prepared for the workplace demands. Ratings by the preceptors and managers of participants’ clinical performance demonstrated at 6 weeks that the groups that participated in the most simulation (25% and 50% of clinical time) did better than the control group who participated in traditional clinical with up to 10 percent of clinical time being in simulation.

Clinical Judgment

A thorough search of the literature reveals that the concepts of critical thinking, clinical reasoning, and clinical judgment are used interchangeably (Brudvig, Dirkes, Dutta, & Rane, 2013; Schubert, 2012; Lasater, 2011; Levett-Jones et al., 2010; Gillespie & Peterson, 2009; Tanner, 2006). While these are inter-related concepts, they are not synonymous. Victor-Chmil (2013) defined critical thinking as “a cognitive process used for analyzing knowledge based on evidence and science” (p. 36). Critical thinking is crucial for the student to learn skills necessary for clinical reasoning. Clinical reasoning incorporates both cognitive and metacognitive processes to analyze knowledge which allows understanding related to clinical situations or specific patients. There are no formal tools to measure clinical reasoning. It is a process that utilizes “decision trees, algorithms, thinking out loud, and reflective journaling” (Victor-Chmil, 2013, p. 35). According to Tanner (2006), clinical judgment incorporates the cognitive, psychomotor, and affective domains of learning demonstrated through both actions and behaviors. Clinical judgment is a complex process that requires the nurse to first use critical thinking and clinical reasoning to make a judgment, to then take appropriate action, and finally, to reflect. Reflection includes reflection in action (immediate evaluation of patient response) and reflection on action (exploring what was learned from the experience). For nurses to grow in their ability to make sound clinical judgments, reflection must take place (Tanner, 2006, p. 204-205).

While clinical judgment has many of the hallmarks of critical thinking embedded within it, one of the characteristics that separate them is that clinical judgment is used to describe clinical or patient care situations and critical thinking is a term that is not limited to healthcare. Clinical judgment goes beyond problem solving. To develop clinical judgment, it is necessary to build on practical experiences, use creativity, have the ability to be intuitive based on each patient’s

situation, having the skill set to act on findings, and then reflect on the actions and patient responses (Benner, Tanner, & Chesla, 2009).

Benner, Tanner and colleagues (2009) defined clinical judgment as:

...the ways in which nurses come to understand the problems, issues, or concerns of clients/patients, to attend to salient information and to respond in concerned and involved ways; included in our understanding of the term is both the deliberate, conscious decision-making characteristics of competent performance and the holistic discrimination and intuitive response typical of proficient and expert performance (p. 200).

Tanner (2006) defined clinical judgment as:

...an interpretation or conclusion about a patient's needs, concerns or health problems and/or the decision to take action (or not), and to use or modify standard approaches, or to improvise new ones as deemed appropriate by the patient's response (p. 204).

Lasater (2007a) refers to clinical judgment as "those thinking and evaluative processes that focus on a nurse's response to a patient's ill-structured and multilayered problems. Clinical judgment is highly contextual, encompassing the nurse's background and the setting, along with the patient's unique needs" (p. 269). While these definitions are different they have three major points in common: (a) patients are unique and have needs that must be identified, (b) the nurse must decide how to react to these identified needs of the patient and (c) the nurse must react.

Definition of Terms

Simulation

Conceptual Definition. Simulation has been defined in nursing as “activities that mimic the reality of a clinical environment and are designed to demonstrate procedure, decision making and critical thinking techniques such as role playing and use of devices such as interactive video or mannequins” (Jeffries, 2005, p. 97). The purposes of simulation in nursing education are to support knowledge previously taught in the formal academic setting, teach new information, allow clinical practice in a safe, non-threatening environment, evaluate the students’ knowledge and clinical “performance,” and to create an environment that stimulates the acquisition of knowledge (Jeffries, 2006, p. 162).

Operational Definition. Simulation is operationally defined as the student’s active involvement with a computerized full-body mannequin that can be programmed to provide realistic physiological responses to actions and interventions provided by the student nurse. The simulation in this study will be a 15 to 20-minute session using actual medical equipment and supplies with a debriefing at the end for the purpose of reflecting. The simulation will use a high-fidelity simulator.

Clinical Judgment

Conceptual Definition. Clinical judgment is a process of noticing, interpreting, and responding to a patient’s needs, concerns, or health problems. The last phase is reflecting on the actions taken and the outcomes of the patient. It requires making interpretations before, during, and after the response to assure patient safety (Tanner, 2006, p. 208).

Operational Definition. Clinical judgment is defined operationally using the Creighton Competency Evaluation Instrument (CCEI) (Todd, Manz, Hawkins, Parson, & Hercinger, 2008).

CCEI focuses on 23 general nursing behaviors divided into four categories:

- Assessment consists of obtaining pertinent data, performing follow-up assessment, and assessing the environment
- Communication includes providers, patient and significant others, documenting thoroughly and accurately, responding to abnormal findings appropriately, and promoting professionalism.
- Clinical Judgment encompasses interpreting vital signs, lab values, relevant versus irrelevant data, prioritizing, performing evidence based interventions, evaluating outcomes, reflecting and delegating appropriately
- Patient Safety incorporates utilizing patient identifiers, standard precautions, handwashing, administering medications safely, managing equipment, technical performance, and reflecting on hazards/errors

This proposed study posits that the language used throughout the CCEI tool aligns with Tanner's (2006) Clinical Judgment Model and can be used to measure clinical judgment in fourth semester nursing students. Noticing is depicted in the assessment subcategory, clinical judgment subcategory (evaluating care) and in the patient safety subcategory (identifying the patient). The clinical judgment subcategory represents the interpretation of data as defined by Tanner (2006). The communication and patient safety subcategories incorporate responding. Lastly, the subcategories of clinical judgment and patient safety integrate reflection.

Theoretical Framework

Tanner's Clinical Judgment Model (2006) will be used as the framework for this study. The model was developed based on reviews of more than 150 studies. The purpose of the Clinical Judgment Model is to describe the thinking process nurses must use to make decisions in complex, unclear, and inconsistent patient situations. The model identifies four facets of clinical judgment: noticing, interpreting, responding, and reflecting. Knowledge is at the center of the model and provides the basis behind the four facets (Tanner, 2006).

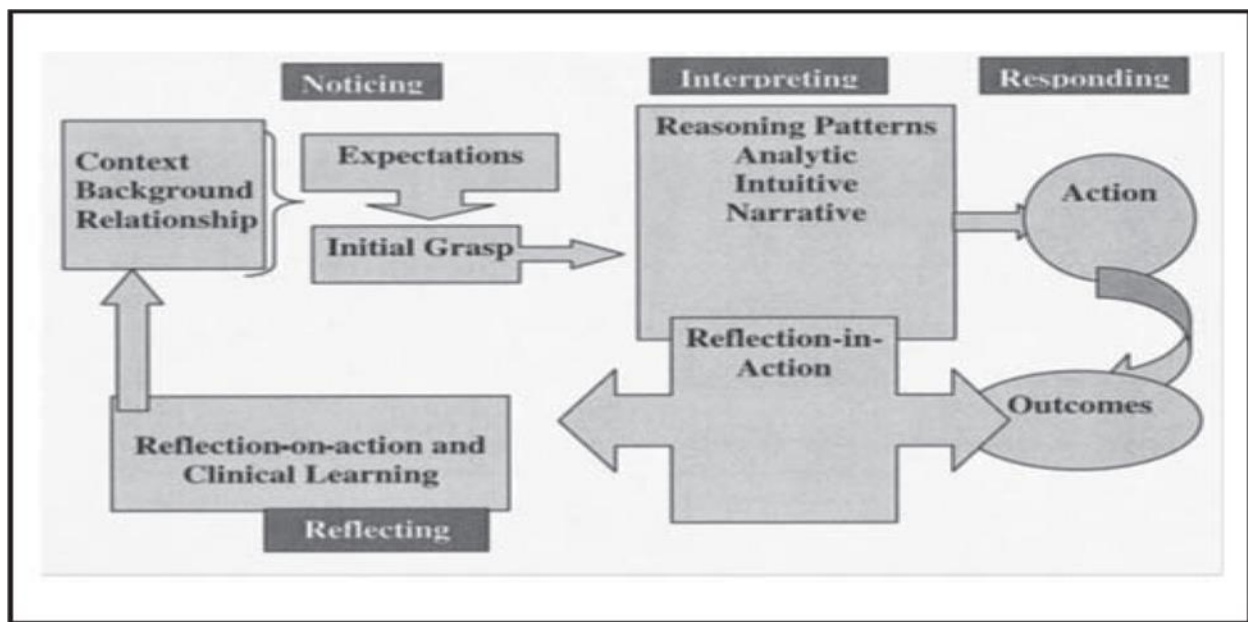


Figure 1. Clinical Judgment Model. From "Thinking like a nurse: A research-based model of clinical judgment in nursing," by C.A. Tanner, 2006, *Journal of Nursing Education*, 45(6), p. 208. Copyright 2006 by Slack Incorporated. Reprinted with permission (See Appendix A).

The first facet, noticing, is more than simply performing an assessment on the patient. According to Tanner (2006), noticing includes the expectations nurses develop about patients based on the nurse's initial awareness of the situation, knowledge of the patient and their specific patterns of response, experiences with taking care of similar patients in the past, and textbook knowledge. Other factors that affect noticing changes in a patient's condition by the nurse include the nurse's perception of what is meant by exemplary patient care, the nurse's values

related to the patient's specific circumstances, the culture of the unit, and the intricacies of the work environment. Nurses who are able to effectively notice are competent in making appropriate observations, recognizing deviations from the expected pattern, and gathering objective and subjective data to discover useful information about the patient and their condition (p. 208). Lasater (2011) states that "noticing involves focused observation, recognizing deviations from expected patterns, and information seeking" (p. 88). The CCEI subcategory of assessment addresses gathering pertinent data, performing follow-up assessments, and assessing the environment. "Recognizing deviations from expected findings" and "responds to abnormal findings appropriately" is addressed under the subcategory of communication. Noticing is also acknowledged with the statement "evaluates evidence based interventions and outcomes" under clinical judgment.

Noticing leads to interpreting the clinical situation. Tanner (2006) describes interpretation by using three reasoning patterns. Analytic reasoning requires the nurse to dismantle the situation, examine each of the elements, and develop options for responding to the situation. Intuitive reasoning involves immediate anticipation of adversity, often without a rationale, based on previous experiences with similar situations. This insight assists the nurse to establish responses that are appropriate for the situation. Narrative reasoning encompasses thinking through the situation and interpreting the situation in a narrative story. The nurse must seek to understand the patient story, personal experiences and condition (p. 209). Lasater (2011) states that interpreting requires the nurse to prioritize the most relevant findings and use the data to plan individualized care that meets the needs of the patient (p. 88). The CCEI recognizes these behaviors in the subcategory of clinical judgment. Identified behaviors include

interpretation of vital signs, labs, subjective and objective data including relevant from irrelevant data, and prioritizing appropriately.

Responding is the implementation of actions and interventions based on the patient's needs. Nurses must have the ability to notice and interpret in order to determine the best actions and interventions for each individual patient. To respond appropriately, the nurse must be "calm and confident, display effective communication skills, be able to plan effectively, be flexible, and be skillful in performing psychomotor tasks" (Lasater, 2011, p. 88). The CCEI addresses responding within three of the four subcategories. Behaviors evaluated under the subcategory of communication include "communicates effectively with the interprofessional team, patient and significant other". Clinical judgment behaviors that address responding include "performs evidence based interventions, provides evidence-based rationale for interventions, and delegates appropriately". The subcategory of patient safety addresses "utilizing standard precautions, administering medications safely, managing technology and equipment, and performing procedures correctly," all of which evaluate responding.

Dewey (1933) describes reflection as a "turning over of a subject in the mind and giving it serious and consecutive consideration" (p. 3). A major focus of Tanner's Clinical Judgment Model is reflection. The model incorporates both "reflection in action" and "reflection on action" (Tanner, 2006. p. 209). "Reflection in action" addresses the reflection that occurs in real time, as the nurse is caring for the patient. It assists nurses in determining outcomes and if actions and interventions are effective in solving identified patient problems. "Reflecting on action" occurs after the chosen actions and interventions are complete. Nurses must take the time to relive the experience in their minds, perform a self-analysis and determine what was learned from the experience. During reflection, nurses must be willing to identify both strengths

and weaknesses and take necessary steps to improve performance when faced with similar situations (Tanner, 2006, p. 209). Figure 1 depicts the thinking process nurses must use to make sound decisions using the four facets of the model.

By applying an organized framework, this study aims to give students the opportunity to notice, interpret, respond and reflect on medical/surgical patient situations that are commonly seen in the clinical setting to develop improved clinical judgment skills. Table 1 illustrates how the language used on the CCEI aligns with the four facets of the Tanner Clinical Judgment Model (2006). The framework will allow the researcher to evaluate how well BSN students are able to work through each facet of Tanner's (2006) Clinical Judgment Model using the CCEI.

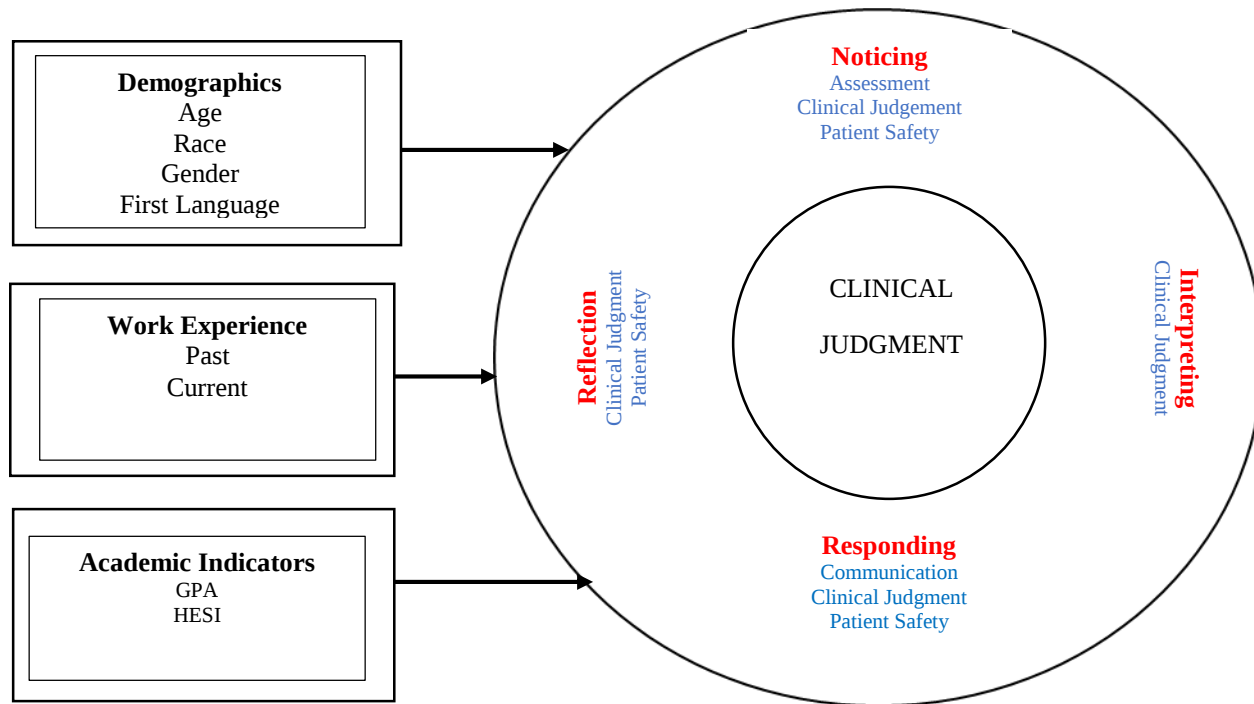


Figure 2. Conceptual Model Based on Tanner's Clinical Judgment Model (2006) & The Creighton Competency Evaluation Instrument and Independent Variables

Purpose of Study

The purpose of this study was to explore the relationship between demographic and academic indicators and clinical judgment of fourth semester senior BSN students.

The questions to be addressed include:

1. What is the level of clinical judgment of fourth semester BSN students during a synthesis simulation as measured by the CCEI?
2. What are the scores on the subscales of the CCEI (assessment, communication, clinical judgment, and patient safety) during a synthesis simulation with fourth semester BSN student?
3. What is the relationship between demographics of the students (age, race, gender, and work experience) and total CCEI and subscale scores?
4. What is the relationship between academic indicators (GPA, HESI scores) and total CCEI scores and subscale scores?
5. What is the relationship between demographics of the student and academic indicators and the scores on Tanner's subcategories of clinical judgment using the CCEI items?
6. What are the best predictors (demographic and academic) of total CCEI scores and sub-scale scores?

Table 1

Aligning Tanner's Clinical Judgment Model (2006) with the CCEI

<u>Tanner's Clinical Judgment Model</u>	<u>Creighton Competency Evaluation Instrument</u>
	Assessment
Noticing	Obtain Pertinent Data
Noticing	Performs Follow-Up Assessments as Needed
Noticing	Assesses the Environment in an Orderly Manner
	Communication
Responding	Communicates Effectively with Intra/Interprofessional Team (TeamSTEPPS, SBAR, Written Read Back of Order)
Responding	Communicates Effectively with Patient and Significant Other (Verbal, Non-Verbal, Teaching)
Responding	Documents Clearly, Concisely, & Accurately
Responding	Responds to Abnormal Findings Appropriately
Responding	Promotes Professionalism
	Clinical Judgment
Interpreting	Interprets VS (T, P, R, BP, Pain)
Interpreting	Interprets Lab Results
Interpreting	Interprets Subjective/Objective Data (Recognizes Relevant From Irrelevant Data)
Interpreting	Prioritizes Appropriately
Responding	Performs Evidence Based Interventions
Responding	Provides Evidence Based Rationale for Interventions
Noticing	Evaluates Evidence Based Interventions and Outcomes
Reflection	Reflects on Clinical Experience
Responding	Delegate Appropriately
	Patient Safety
Noticing	Uses Patient Identifiers
Responding	Utilizes Standardized Practices and Precautions Including Hand Washing
Responding	Administers Medications Safely
Responding	Manages Technology and Equipment
Responding	Performs Procedures Correctly
Reflection	Reflects on Potential Hazards and Errors

Note. Adapted from Tanner's Clinical Judgment Model Copyright 2006 by Slack Incorporated and the CCEI Copyrighted 2013 Creighton University College of Nursing, Omaha, Nebraska.

Many studies have focused on self-efficacy, confidence, competence, knowledge, and skill acquisition (Alinier, Hunt, Gordon, & Harwood, 2006; Bambini, Washburn & Perkins, 2009; Blum, Borglund, & Parcells, 2010; Cardoza & Hood, 2012; Christian & Krumwiede, 2013; Dunn, Osborne, & Link, 2014; Jeffries, & Rizzolo, 2006; Kameg, Howard, Clochesy, Mitchell & Surskey, 2010; Roh, Lim, & Issenberg, 2014; Shinnick, & Woo, 2014). Few quantitative studies have been published within the last 5 years on the impact of simulation on clinical judgment (Cazzell & Anderson, 2016; Yuan, Williams & Man, 2014; Lindsey & Jenkins, 2013). The Lasater Clinical Judgment Rubric (LCJR) (Lasater, 2007b) was utilized in two of these studies (Cazzell & Anderson, 2016; Yuan et al, 2014), while Lindsey and Jenkins (2013) used a multiple-choice survey as the measurement instrument. This study will explore the relationship between demographics, work experience, and academic indicators and clinical judgment. Using the CCEI, clinical judgment will be measured quantitatively and attributes that correspond with each of the four subcategory scores of the CCEI and total CCEI scores will be evaluated. There is no information in the literature that explores what characteristics about the nurse are related to the development of clinical judgment.

CHAPTER TWO: REVIEW OF THE LITERATURE

This chapter will provide an overview of the literature related to the variables within the study and identify gaps in the research on the impact of high fidelity simulation (HFS) on clinical judgment in the education of nursing students. The concepts that are explored are clinical judgment development and HFS use as it pertains to educating nursing students. The first part of the chapter focuses on the clinical judgment literature. The second part of the chapter provides a review of the literature on simulation. Finally, the literature that specifically examines the development of clinical judgment using HFS is discussed.

A careful search of the literature was performed. Databases searched included Medical Literature Online (MEDLINE), Cumulative Index to Nursing and Allied Health Literature (CINAHL), and Education Resource Information Center (ERIC). Search terms included: "simulated patient," "simulation," "high fidelity simulator," and "clinical judgment."

Clinical Judgment

The Performance Based Development System Assessment (PBDS) was designed to evaluate critical thinking capabilities in order to advance practice and assist in the development of essential skills needed to provide safe patient care (del Bueno, 2005; Imanipour & Jalili, 2015). Fero, Witsberger, Wesmiller, Zullo, and Hoffman (2009) used the PBDS to measure critical thinking skills in 2,144 new graduate nurses. The clinical judgment portion of the PBDS, as designed by del Bueno (2005), consists of 10 videotaped vignettes representing common clinical problems that nurses encounter. Fero and colleagues (2009) found that 25% of the new graduates had deficiencies in recognizing problems, reporting essential clinical data, prioritizing and initiating independent nursing interventions, anticipating relevant medical orders, and providing appropriate rationale to support decisions. The authors recognized that PBDS can

assist in providing information about critical thinking and learning needs to help facilitate individualized orientation. They also noted that studies are needed that identify innovative educational strategies that will enhance critical thinking and decision-making in nursing. HFS was identified as a possible better means of evaluating critical thinking as well as decision-making based on the interaction with a patient and the debriefing/reflective component. HFS should be used in nursing education programs to help develop the clinical judgment skills needed by new graduate nurses to provide safe and efficient care.

Johnson and Johnson (2014) investigated if there were statistically significant differences between groups receiving HFS versus CD-ROM educational strategies. The outcome variables were scores on critical thinking and performance instruments. The HFS group posttest scores were significantly higher than the control group scores for both critical thinking and performance. There were no significant differences in critical thinking posttest scores between the CD-ROM and control groups or the CD-ROM and HFS groups. The HFS group performed significantly better than the CD-ROM and control groups while the CD-ROM group did not perform significantly better than the control group. The authors posited that the reason for the HFS group doing better was the realism of the simulation that allowed hands-on experience. Participants were better able to learn facts, apply principles, institute treatments and evaluate treatments using HFS.

Baxter and Rideout (2006) used a qualitative approach to analyze the decision-making activities of second year baccalaureate nursing students (N=12) in their first clinical rotation. The purposes of this study were to: (a) discover how second year baccalaureate nursing students determine the need to make a clinical decision; (b) determine how they respond to a pending clinical decision; (c) discover the types of decisions nursing students make in the clinical setting;

and (d) explore the factors that enhance or impede the decision-making process. Data was collected using journals and interviews. Once the journals were read, each student was interviewed using questions based on the student's journal entry. The study findings showed that student decision-making is complicated. Students tried to make decisions that would be helpful to the patients. If the decisions were extremely difficult, students did not avoid the situation, but rather sought out assistance in making the clinical decision. The three components found to affect student clinical decision-making were: (a) the students' knowledge base, (b) their level of confidence, and (c) fear. This study supports the conclusion that the clinical setting is stressful for students. Based on the findings from this study, developing learning opportunities in a laboratory setting could help students increase their knowledge base, boost their confidence level and decrease their fears.

Critical thinking is a skill that is needed for all levels of cognitive education. Based on the definitions of critical thinking and clinical decision-making found in the literature, clinical judgment is what nursing students need to develop during their undergraduate education. The findings of the above studies support the use of laboratory settings as an environment to increase knowledge and confidence while decreasing fears. Simulation can offer students the ability to independently make clinical judgments in a safe environment to add to their existing knowledge base.

Simulation

With the advancement of mannequins into life like figures, simulation use as a teaching pedagogy in nursing education has rapidly evolved and become more prominent in the last ten to fifteen years (Gobbi, et al., 2012). High fidelity simulators can be programmed to mimic lifelike patient situations. The simulators resemble live patients in their features and ability to respond to

interventions. For example, a rise in the finger stick glucose can be simulated when the IV site infiltrates and the insulin is no longer infusing. Simulators can be programmed to display a variety of life like assessment findings such as heart sounds, breath sounds, pulses, and pupils that react to light. While simulation with a focus on clinical judgment has been studied over the years, there is no agreement on a best practice method for assessing clinical judgment. Table 2 summarizes the focus topics used in past simulation studies.

Larew, Sessans, Spunt, Foster, and Covington (2005) conducted a qualitative study to develop protocols which would improve the learning of beginning nursing students. These students reported feeling overwhelmed and anxious during complex scenarios. This information served as the basis for developing new protocols that would result in positive learning experiences to challenge students at their current level. One hundred-ninety students in an adult health course participated in scenarios that focused on common postoperative complications.

Prompts were woven into the medical record and shift reports were included to assist students in gathering important information. Some students were able to respond to the vague prompts while the less experienced students needed more specific prompting. Students with successful outcomes reported a higher level of self-efficacy. Based on these results the study authors concluded that the learners' current level of abilities must be considered when developing simulated experiences. Similarly, Ashley and Stamp (2014) found that goals and objectives of simulation should be different based on the academic level of the students in their work comparing sophomore level students with junior level students.

Table 2

Focus Topics in Simulation Studies

<u>Focus Topic</u>	<u>Empirical Sources</u>
Perceptions of simulation	Ballie & Cruzio (2009); Bambini, Washburn & Perkins, (2009); Prescott & Garside (2009); Lasater, (2007b); Baxter & Rideout (2006); Jeffries & Rizzolo (2006)
Clinical Judgment	Cazzell & Anderson (2016); Lee, Lee, Lee, & Bae (2016); Ashley & Stamp (2014); Johnson & Johnson (2014); Lindsey & Jenkins (2013); Bambini, Washburn & Perkins (2009); Dillard, et al (2009); Jeffries & Rizzolo (2009); Lasater (2007b); Baxter & Rideout (2006)
Confidence/Self-confidence	Mould, White, & Gallagher (2011); Blum, Borglund, & Parcels (2010); Bambini, Washburn & Perkins, (2009); Jeffries & Rizzolo (2009); Brannan, White, & Bezanson (2008); Alinier, Hunt, Gordon, & Harwood (2006)
Competence	Lee, Lee, Lee, & Bae (2016); Blum, Borglund, & Parcels (2010); Bambini, Washburn & Perkins, (2009); Alinier, Hunt, Gordon, & Harwood (2006)
Knowledge	Cazzell & Anderson (2016); Hall (2015); Gates, Parr, Huguen (2012); Buykx, et al (2011); Brannan, White, & Bezanson (2008); Birch, et al. (2007); Jeffries & Rizzolo (2006)

A study by Alinier, Hunt, Gordon, and Harwood (2006) examined the effects of scenario-based simulation on nursing students' clinical skills and competence. This study used a pretest/posttest design. The participants were volunteer second year students (N = 99) from a second year Diploma of Higher Education in Nursing program in the United Kingdom. Initially all the students were assessed using the Objective Structured Clinical Examination (OSCE), a performance based test to measure clinical competence. Participants navigated through a series of stations that were simulated experiences. As they participated in each station, they were

observed and evaluated. Once the OSCEs were complete, the students were randomly placed in a control group (N = 50) or an experimental group (N = 49). The students all followed their standard curriculum. Students in the experimental group participated in a clinical intensive care simulation exercise over two afternoons. The two groups had similar mean scores on OSCE 1 (control = 48.82; experimental = 47.54). The OSCE 2 scores increased for both groups, but the experimental group demonstrated the largest improvement (control = 56, a 7.18% increase; experimental = 61.2, a 14.14% increase). This study supports the use of simulation in clinical education as well as the use of simulation for educational purposes in health care settings. The authors concluded that simulation is an effective means of teaching skills. They also suggested that facilitators have less interaction with students during scenarios allowing the students to drive the simulation by making independent decisions about patient care based on assessment findings. By allowing autonomy during simulation, students learn from their own successes and failures in a safe environment. Debriefing was also identified as essential to ensure students understand the expected take away points from the experience. While this study supports the use of simulation with nursing students to develop confidence in skills, more studies are needed to validate the effectiveness of simulation training in nursing education to develop higher level thinking skills like clinical judgment.

Radhakrishnan, Roche, and Cunningham, (2007) conducted a quasi-experimental pilot study using simulation to evaluate clinical performance. The participants were 12 senior baccalaureate nursing students completing a second degree. A comparison of the students' clinical performance with and without simulation was completed. Students were randomly assigned to an intervention group (N = 6) or a control group (N = 6). All students were participating in 320 hours of clinical with a preceptor. The intervention group participated in a

simulation exercise with a complex two patient assignment. The control group did not participate in the simulated activities during the semester. At the end of the semester, both groups participated in a two-patient clinical simulated experience. The students were evaluated using a faculty-developed evaluation tool that emphasized safety, basic assessment, prioritization, problem focused assessment, interventions, delegation, and communication. The two areas where the intervention group excelled as compared to the control group were safety and basic assessment skills. There were no significant differences in the remainder of the categories. These findings support the use of simulation to reinforce basic assessment and safety. With concentrated efforts on scenario development, simulation can also foster the development of many complex skills.

A study conducted by Smith and Roehrs (2009) involving HFS analyzed the correlation between nursing students' satisfaction and self-confidence. The researchers also looked at demographics of the students and the design characteristics of the simulation. The 68 participants were juniors in their first medical-surgical course. The students were placed into groups of four with two students assuming the nurse role and two students observing. The simulated patient was elderly with a respiratory disorder. The scenario lasted until the students either completed the pertinent interventions including giving the pertinent medications or 20 minutes had passed. Immediately after the simulation, the students completed the Student Satisfaction and Self-Confidence Scale as well as the Simulation and Design Scale (SDS), both of which were developed as part of the NLN/Laerdal simulation research study (NLN, 2006). The SDS consists of five subcategories: objectives, support, problem solving, guided reflection, and fidelity. No strong correlations emerged, between student satisfaction and the subcategories of the SDS or between the self-confidence scores and the subcategories of the SDS. A multiple

linear regression analysis was conducted and found that almost half of the variance in satisfaction and self-confidence scores was explained by the five subcategories together. The largest variance for satisfaction was objectives and the largest variance for self-confidence was problem solving. There were no significant correlations between satisfaction and self-confidence and the four demographic variables (age, gender, previous work experience, and simulation experience). The most important finding, according to Smith and Roehrs (2009), was that the design of the simulation experience is a significant factor in the outcomes. Educators should spend more time planning the design of the simulation in order to achieve the desired outcome. These findings support the work of Larew et al. (2005) and Radhakrishnan et al. (2007) who found that design was a key factor in simulation-based learning.

Other studies have explored simulation and the effect it has on knowledge, competence, cognitive skills, and safety. Hall (2015) used a pretest/posttest approach comparing a simulation group with a non-simulation group. Findings demonstrated higher scores on the ATI® NCLEX predictor exam for the simulation group. Similarly, Brannan, White, and Bezanson (2008) compared traditional classroom lecture with the use of HFS to teach care of the patient with an acute myocardial infarction. Results demonstrated that the HFS group scored higher on the author-developed Acute Myocardial Infarction Questionnaire posttest. Conversely, Jeffries and Rizzolo (2006) reported no differences in knowledge acquisition between a case study group, LFS group, and HFS group. This raises the question of what level of simulation fidelity is necessary to disseminate knowledge. Competency assessment using HFS has been investigated by Lee et al. (2016), as well as Ironside, Jeffries, and Martin (2009). Lee et al. (2016) used a comparison group and reported significantly higher nursing competency scores in the experimental group that participated in several HFS experiences over the semester. Ironside, et

al (2009) reported an increase in competency of nursing students using simulation over time. However, no control group was utilized in the study by Ironside and colleagues for comparison purposes.

Clinical Judgment and High-Fidelity Simulation

In a study by Lasater (2007b), student responses to simulation were used to develop a rubric describing levels of performance in clinical judgment based on Tanner's (2006) Clinical Judgment Model. The study employed a qualitative-quantitative-qualitative design. The forty-eight participants were third semester juniors in a baccalaureate nursing program enrolled in an adult medical surgical clinical course. The participants were divided into 12 groups with teams of 3 in each group. Over a seven-week period, students participated in simulation one day a week in lieu of their clinical experience. As the participants were observed, the investigator wrote down descriptors to explain the four aspects of clinical judgment as defined by the Tanner (2006) Clinical Judgment Model. With each simulated experience the descriptions were revised. The rubric was then tested by using it to score students' performance. Scores were analyzed using ANOVA to determine the variance in scores based on the simulation being done on the first day or second day of clinical, whether the simulation was done in the early part of the day or later part of the day, and whether the student groups consisted of 2 or 3 students. There were no statistically significant findings using ANOVA with this small sample. Focus groups were formed after the experience to elicit student perceptions. Students stated simulation made them think about the patient and anticipate their needs. Students wanted more direct feedback from the facilitator after the simulated experience. These qualitative findings support the use of a tool like the Lasater Clinical Judgment Rubric (LCJR) to help the student understand the concept of clinical judgment, become familiar with the terminology used to describe clinical judgment and

provide a means of assessing clinical judgment. Many students mentioned how valuable the debriefing session was after each simulation to assist them in their reflections of the experience. While this tool was studied using simulation, clinical experiences also provide opportunities to develop clinical judgment; this tool, as well as others, should be tested to give students feedback in clinical experiences as a whole.

Two separate qualitative studies evaluating simulation and clinical judgment (Ashley & Stamp, 2014) and simulation as a means of increasing self-efficacy (Bambini, Washburn & Perkins, 2009) reported similar themes. Both studies identified communication with patients and families as important to gather pertinent information. Assessment was identified in both studies as an important initial action in assisting with prioritization, helping guide interventions, and identifying abnormal findings.

Dillard et al. (2009) explored faculty and student perceptions of the impact of simulation on actual clinical practice. Findings supported the use of a standardized method for evaluating learning during simulation using the Tanner (2006) Clinical Judgment Model. The authors proposed that this can be accomplished by including the clinical judgment framework language in assignments and evaluations. Kantar and Alexander (2012) published a study that explored the influence of curriculum on the development of clinical judgment and the perceptions of preceptors about the clinical judgment abilities of new baccalaureate nursing graduates. Twenty preceptors for new graduate nurses participated. Since the new graduate nurses graduated from three different schools of nursing, these three curriculums were analyzed. This qualitative study used Tanner's (2006) Clinical Judgment Model to analyze the three curriculums to ensure clinical judgment was included in each. The experiences of the 20 preceptors were obtained by one-on-one interview using the Lasater (2007b) Clinical Judgment Rubric (LCJR) as a guide.

The curriculum analysis revealed insufficient language to demonstrate a strong association to clinical judgment skills. The preceptors' responses helped identify the clinical judgment skills that were deficient in the new graduates. Curriculum reformation must support the development of clinical judgment in students. New modalities to support these curriculums must be developed and tested for effectiveness.

Lindsey and Jenkins (2013) conducted a pretest/posttest two-group study to examine the impact of lecture and simulation on clinical judgment. All participants completed an eleven item pretest on Code Blue and Rapid Response situations. This was followed by a ten-minute lecture on Code Blue with a two minute explanation of Rapid Response. Students then participated in a guided Code Blue simulation. The control group took the posttest after the simulated experience. The experimental group participated in an extra ten-minute lecture on Rapid Response and a Rapid Response simulation prior to taking the posttest. While both groups showed improvement from pretest to posttest, the experimental group showed significantly higher posttest scores. While the authors stated the aim of this study was to examine the impact of lecture and simulation on clinical judgment, the construct being measured in the eleven-item multiple choice pre-and posttest was not identified.

Yuan, Williams, and Man (2014) used a quasi-experimental, single group repeated measure design to assess clinical judgment using HFS. Participants completed five simulations in a 36-hour time frame. Two raters using the LCJR assessed the performance of each participant. Clinical judgment increased for all participants between time one and time five. There was no comparison group to control for confounding factors such as clinical experiences. While simulation with a focus on clinical judgment has been studied over the years, there is not an established method of assessing clinical judgment.

Instruments

There have been many different instruments used to measure clinical judgment as well as other variables during simulation. Several studies used the LCJR (Cazzell & Anderson, 2016; Yuan, Williams & Man, 2014; Dillard et al., 2009; Lasater, 2007b). Sideras (2007) used the LCJR and reported reliability scores ranging from $r = 0.57-1.0$. This study incorporated a variety of raters and scenarios. Gubrud- Howe (2008) reported reliability on the LCJR of 0.92-0.96, while Adamson (2011) found reliability of 0.889 using three scenarios and 29 raters. Adamson, Gubrud-Howe, Sideras, and Lasater (2012) noted that each of three studies (Adamson, 2011; Gubrud-Howe, 2008; Sideras, 2007) measured validity differently but reported the instrument to be valid. When the results of these studies was combined, it was found the reliability was affected by characteristics of the raters. Raters should be trained and selected based on their area of expertise as it relates to the scenario to be used. Inter-rater reliability was also found to be affected by the number of raters and scenarios used. Yuan et al (2014) reported an inter-rater reliability on 5 different scenarios as 0.883-0.910. Dillard et al. (2009) did not specifically speak to validity or reliability in findings from their study, but rather used the findings of Sideras (2007).

Other studies have utilized investigator developed tools. Lindsey and Jenkins (2013) stated the tool they created contained five questions that assessed clinical judgment. There was no reported validity or reliability of this questionnaire. Johnson and Johnson (2014) developed a 107 item performance instrument with the assistance of six expert nurses. The expert nurses determined that all items were comprehensive, reflective and essential. The validity was established at 100% for this instrument during this study. Reliability was established using Pearson product-moment correlation ($r = 0.96$), which demonstrated good inter-rater reliability.

Correlated scores using a second assessment with the same investigators and participants were established with Pearson product-moment correlation ($r = 0.94$), demonstrating stable reliability over time.

Dillard et al. (2009) concluded that standardized methods for evaluating student learning in simulation are lacking. Lindsey and Jenkins (2013) point out the need for empirical examination of outcomes related to clinical simulation rather than continued focus on student perceptions. This study proposes the use of the Creighton Competency Evaluation Instrument to measure clinical judgment using quantitative means.

Conclusion

Clinical judgment has been identified in the literature as a complex process that requires the demonstration of cognitive, psychomotor, and affective skills through actions and behaviors. The concepts of critical thinking, clinical reasoning and clinical judgment are used interchangeably in the literature. While these terms are inter-related, they are not synonymous. Clinical judgment requires the use of both critical thinking and clinical reasoning. To make a clinical judgment the nurse must use both critical thinking and clinical reasoning to make a decision, take appropriate action, and then reflect on then situation.

The nursing profession has acknowledged for many years that there is a gap between new graduate nurse competencies and the complex requirements of the health care system. Clinical judgment affects the nursing care given to patients in the clinical setting. According to Tanner (2006), the development of sound clinical judgment in new graduate nurses plays an important role in positively affecting patient care.

The development of clinical scenarios using HFS has the potential to provide nursing students with the necessary experiences to be better equipped to meet the challenge of providing

effective, safer care in a constantly changing healthcare environment. Based on the importance of clinical judgment in the provision of safe patient care, more studies need to be done to explore innovative teaching strategies to enhance the development of clinical judgment in nursing students. Using HFS can fulfill the need for the interactions to be realistic while also being safe for the patient and student.

CHAPTER THREE: METHODOLOGY

The purpose of this study was to explore the relationship between demographics, work experience, and academic indicators on clinical judgment of fourth semester senior BSN students

The questions addressed included:

1. What is the level of clinical judgment of fourth semester BSN students during a synthesis simulation as measured by the CCEI?
2. What are the scores on the subscales of the CCEI (assessment, communication, clinical judgment, and patient safety) during a synthesis simulation with fourth semester BSN student?
3. What is the relationship between demographics of the students (age, race, gender, and work experience) and total CCEI and subscale scores?
4. What is the relationship between academic indicators (GPA, HESI scores) and total CCEI scores and subscale scores?
5. What is the relationship between demographics of the student and academic indicators and the scores on Tanner's subcategories of clinical judgment using the CCEI items?
6. What are the best predictors (demographic and academic) of total CCEI scores and sub-scale scores?

The study used a non-experimental descriptive correlational single group design. Quantitative methods emphasized objective measurements and the statistical analysis of data with the goals of gathering data and generalizing across groups of people. (Gliner, Morgan, & Leech, 2017).

Sample

Annual enrollment in the College of Nursing (CON) from which participants were selected is approximately 525 students in the traditional baccalaureate nursing program (BSN). Each fall and spring 135 students are admitted to the traditional BSN option. Students who enter the nursing program are juniors and are considered high academic achievers with an average GPA of 3.52 on a 4.00 scale. A convenience sample of enrolled nursing students from the CON who completed 3 semesters as well as two summer sessions and were in their final semester of nursing school were asked to participate.

All students were exposed to simulation throughout the curriculum. As part of the established course requirements, all students in their final semester were required to participate in a simulation that was not graded. After IRB approval (See Appendix B) the researcher invited 110 students to participate in this study. The course faculty provided students with information via email that described the study details and what was expected (See Appendix C). Students were able to decline study participation by not signing the consent prior to the simulation. For students who agreed to participate in the study, the PI (who was not assigned to teach this course) evaluated the simulation using the CCEI. Data was used for the research but was not shared with the course faculty. A convenience sample of 108 fourth semester nursing students was recruited for the study. A priori, sample size was determined using G*Power (Faul, Erdfelder, Lang, & Buchner, 2007). Based on a power analysis with $p < 0.05$, a power of 0.80, a moderate effect size ≥ 0.30 , and following a two-tailed significance test, the researcher determined that a sample of at least 82 participants was needed for this study. A sample size larger than the required 82 was sought to accommodate for any unusable data based on

incomplete information and to further strengthen the power and detect the presence of correlation.

Setting

The study took place at a southeastern public university. The university is accredited by the Commission on Colleges of the Southern Association of Colleges to award bachelors, master's, and doctoral degrees. The Health Sciences Division encompasses approximately 33,000 square feet in seven buildings and houses the CON. The CON is recognized as a Center of Excellence in nursing education, research, and practice by the National League for Nursing. The BSN program is accredited by the Commission on Collegiate Nursing Education (CCNE).

The nursing curriculum is four semesters plus a summer session of study (two academic years). Prior to being admitted into the CON, students are required to complete course work in social, behavioral, and natural sciences as well as in the humanities. Students are admitted to the CON in both fall and spring semesters. The curriculum requires 128 semester hours total and 67 semester hours in nursing. Of these 67 hours, 43 hours are paired with a clinical or lab component. Clinical practice involves student placements in over fifty agencies including hospitals, home health, public health, private homes, schools, clinics, and other community organizations. Low fidelity and/or high-fidelity simulation is incorporated into each clinical course and laboratory experience within the curriculum.

The CON houses eight state-of-the-art Concepts Integration Laboratories (CILs). The CILs help prepare students to become a part of the profession of nursing by offering opportunities to integrate nursing concepts and critical thinking skills in a safe environment. There are five nurses and one instructional technologist dedicated to the operation of the CILs. There are five simulation laboratory rooms that are equipped with mounted video cameras and an

observation area for faculty and CIL staff. This study took place in one of two simulation labs that have the ability to video and audio record the simulations. Each of the simulation labs has an observation area that houses the computer that runs the simulator, the CIL staff that is driving the simulation and the researcher. The simulation team and the student were the only people in the lab during the simulation. All simulations took place on weekdays.

Instruments

Demographics and Student Characteristics

A researcher-developed, 12 question survey was administered to gather basic demographic information about the subjects, including age, gender, race, and primary language. The instrument also gathered information about work experience in health care (see Appendix D). This survey was dated, timed, and numbered in order to match and compare data from the CCEI completed on each student.

Academic Variables

Grade point averages were collected with the assistance of the Student Services Office at the ECU CON. The Elsevier/HESI Exit Exam™ (E2) is a 150-question test that is used by the CON at the end of the students' program of study to evaluate success on National Council State Licensing Exam (NCLEX-RN). The HESI™ (E2) has been studied for many years to determine how accurately it predicts NCLEX success (Adamson & Britt, 2009; Young & Willson, 2012; Langford & Young, 2013). The HESI™ (E2) has been found to be a valid and reliable test to predict NCLEX success.

Scoring on the HESI™ (E2) divided into 8 categories by Elsevier ranging from > 950: outstanding probability of passing to <649: poor performance expected. For the purposes of this study, HESI™ scores were divided into three categories: less than 850 (below average

probability of passing NCLEX), 850 to 900 (average probability of passing NCLEX), and greater than 900 (excellent probability of passing NCLEX). Content validity for the HESI Exit Exams™ (E2) was achieved through use of the NCLEX-RN blueprint to determine content, types of questions, and reading level. Reliability was determined for each edition and version by conducting item analyses on each exam and statistically calculating reliability. Elsevier regularly conducts research to assess the predictive validity of the HESI™ (E2) exit exam. For the eleven completed validity studies, the HESI™ (E2) was found to have 94.8% to 99.2% accuracy in predicting NCLEX-RN success for students who achieved the recommended score of 850 or greater. HESI™ (E2) scores were collected from the secure Elsevier/HESI Assessment™ Faculty Access website.

Creighton Competency Evaluation Instrument

The CCEI (See Appendix E) was used by the researcher to evaluate the level of clinical judgment demonstrated by each student. The CCEI is a revision of the original Creighton Simulation Evaluation Instrument (CSEI). Todd et al. (2008) developed and evaluated the CSEI, a quantitative tool to assess students' performance during simulated clinical experiences (SCE). The CSEI used The American Association of Colleges of Nursing (AACN, 1998) core competencies to provide its framework. The framework included assessment, communication, critical thinking, and technical skills. Skills checklists and most other clinical evaluation tools in nursing education consider cognitive, affective, and psychomotor domains of learning separately. In reality, all of these domains are being used simultaneously to assist the nurse in making judgments that will impact patient outcomes. The CSEI was developed to help bring the domains of learning together and evaluate simulation more accurately.

Twenty-two behaviors were identified as essential to be included in the instrument and were assigned to one of the four broad categories. These behaviors were evaluated as 0 = does not demonstrate competence or 1 = does demonstrate competence. The developers felt that a behavior would be either met or not met and opted not to include a partially or mostly met in the evaluation (Todd et al. 2008).

The CSEI was revised by the National Council of State Boards of Nursing (NCSBN) and the original developers. The revisions incorporated concepts from the Quality and Safety Education for Nurses Institute (Cronenwett et al. 2007) and the revisions of *The Essentials of Baccalaureate Education for Professional Nursing Practice* (AACN, 2008). The subcategories of critical thinking and technical skills on the original instrument were changed to clinical judgment and patient safety. There were also minor changes in wording made throughout the tool to make it a tool suitable for simulation and clinical practice settings. The revised tool was renamed the Creighton Competency Evaluation Instrument (CCEI) to reflect the changes (Hayden, Keegan, Kardong-Edgren, & Smiley, 2014).

Validity is the extent to which an instrument measures what it is designed to measure and performs as it is designed to perform (Polit & Beck, 2012). Content validity focuses on how accurately an assessment or measurement tool expresses the various aspects of the specific construct. Face validity is often used to indicate whether the instrument, on the face of it, appears to measure what it claims to measure. Todd et al. (2008) reported that content validity of the CSEI was tested using seven faculty members with a variety of clinical expertise and experienced in simulation. The behaviors were evaluated by each faculty member to determine if they were necessary to be included in the instrument, whether they were reflective of the category each was assigned, and if the behaviors were easy to understand. A Likert scale

ranging from 1 (strongly disagree) to 4 (strongly agree) was used to complete the evaluation. The results showed the faculty members thought that each behavior was important to include ($M = 3.84$, $SD = 0.12$), reflected the assigned category ($M = 3.85$, $SD = 0.12$) and that each behavior was easy to understand ($M = 3.82$, $SD = 0.23$). The faculty were then asked a series of questions about the instrument as a whole and its usefulness, utilizing the same Likert scale. The overall results were positive ($M = 3.83$, $SD = .10$). The authors did not report construct or criterion validity.

Reliability establishes how consistently the instrument measures the attribute of interest (Polit & Beck, 2012). Assessing the reliability of an instrument is accomplished by examining stability, internal consistency, and equivalence. Todd et al. (2008) reported equivalence using inter-rater reliability of the CSEI. Inter-rater reliability was tested by piloting the instrument with 72 senior level BSN students in their final semester. All faculty were trained in using the tool and students were evaluated by two faculty during a simulated experience. The inter-rater reliability on the four categories ranged from .85 to .89 (Todd et al., 2008). How the inter-rater reliability was established in developing this instrument, however, was not clearly stated.

Hayden, Keegan et al. (2014) reported validity and reliability of the CCEI. Three BSN and two ADN programs were used to test validity and reliability. The content validity was completed using 35 nurse educators with at least six years of teaching experience. The findings were very similar to the original content validity results ($M = 3.10$, $SD = .23$) on the CSEI as described by Todd et al (2008). Hayden, Kegan et al. (2014) tested inter-rater reliability using 31 faculty. The faculty reviewed videos of students performing the same simulation and rated each student using the CCEI. The ratings of each of the 31 evaluators were compared to an expert rater according to Hayden, Kegan et al. (2014). The overall agreement with the expert

rater was 79.4%. Cronbach's alpha was greater than .90 and considered highly acceptable (Polit & Beck, 2012).

Data Collection

There were two recruitments periods for this study during the 2016 fall semester, as NURS 4511 Clinical Capstone is taught twice during the 14-week semester. All students enrolled in NURS 4511 received an email from their faculty informing them of the opportunity to participate in the research and the date when they could enroll in the study. Handouts were provided using the NURS 4511 Blackboard Learn online platform prior to the scheduled simulations. These handouts highlighted the purpose and goals of the study, the population sought, and the researcher's contact information.

Enrollment and consent occurred just prior to the scheduled simulation. Students were asked to report to the simulation lab where informed consent was obtained. The researcher conveyed to students that their agreement to participate in the study meant having their demographic information, GPA, HESI™ (E2), and CCEI scores included in the study database. A decision not to participate in this study meant that they would still be observed and scored during simulation and debriefing however, scoring sheets would be destroyed at the end of the simulation day and their scores would not be included in the study database. This procedure protected the identity of students who chose to participate and those who did not. The researcher coded all demographic surveys and all CCEIs prior to the simulation with an identification number, assigning each potential participant with a unique number. This allowed the researcher to use the study numbers in place of names for the study data collection to protect student identity.

After consent was obtained, students individually participated in a 15 to 20-minute simulation using either the CHF or MI scenario. For this research study, the researcher observed and scored students while they participated in the simulations and debriefings already required for the course.

The high-fidelity simulations were not identical for block one and block two. The scenarios were developed by the researcher as well as the CIL staff. Input was sought from medical surgical faculty at the CON to assure equal difficulty and acuity as well as validity.. The two high fidelity simulations the researcher observed during this study were: congestive heart failure and myocardial infarction. The CCEI critical behaviors for congestive heart failure (See Appendix F) and myocardial infarction (See Appendix G) were identified using the assessment, communication, clinical judgment, and patient safety worksheets provided online by the creators of the instrument. Scenarios were designed using the NLN Simulation Design Template. The researcher and the CIL staff bench tested each simulation prior to the subjects' participation. Prior to beginning of the study, the researcher viewed the CCEI online tutorial to assure proper use of the tool. The assessment, communication, clinical judgment, and patient safety worksheets available online were utilized to identify specific behaviors necessary to demonstrate competency under each subcategory.

After the simulation the participants reported to the CON Learning Resource Center and filled out the demographic/student characteristics questionnaire. The data collected from the CCEI during the simulation as well as the demographic/student characteristics questionnaire of students who agreed to participate in the study were utilized. HESI (E2) scores were obtained from the Elsevier secure website. GPA was obtained with the assistance of the Student Services Department in the CON.

The SimMan 3G® HFS mannequin, made by Laerdal Medical Corporation, was used for the study. This is a full body mannequin that can be computer programmed to mimic real life patient behaviors. The participants encountered a real-life patient problem when interacting with the HFS mannequin. The actions taken by the participants to intervene were evaluated using the CCEI. The HFS provided many opportunities for students to apply principles of nursing care and demonstrate clinical judgment in a safe environment (Bambini et al., 2009; Blum et al., 2010; Dillard et al., 2009; Johnson & Johnson, 2014).

The researcher was the only evaluator during the simulation. The researcher completed the CCEI during the simulation with the opportunity to review the simulations using video recordings after the session. Students were asked to complete a demographic survey after participating in the simulation. This took the participants approximately 5 minutes. A laboratory coordinator was present for each simulation, playing the role of patient through a speaker system. The laboratory coordinator also had the ability to adjust critical events during the simulation to allow a unique experience for each student.

Ethical Considerations

There are several ethical problems that need to be considered when conducting research that involves faculty as researcher and students as participants. The nature of the faculty/researcher and student relationship must be considered when exploring options to respect person as well as maintaining beneficence and justice. Students must be treated as a vulnerable population when participating as research subjects. Shamoo and Resnik (2009) stated that researchers must act responsibly to protect subjects, especially subjects that would be considered vulnerable. In this case faculty were not be involved in the research.

In this research study, the researcher only had one role which was that of researcher. The faculty in NURS 4511 did not take part in the simulation or data collection.

This study proposed to use information in the student's educational record such as GPA and HESI Comprehensive Testing scores. The Family Educational Rights and Privacy Act (FERPA) is a federal law that protects the privacy of personally identifiable information contained within a student's educational record. Educational records are defined as records containing information that directly relate to a student and are maintained by an educational institution or by a party acting for the institution. The researcher provided the school with written permission from the student in order to obtain any information from the student's education record. The written consent must: (1) specify the records that may be disclosed; (2) state the purpose of the disclosure; and (3) identify the party to whom the disclosure may be made (FERRPA, 2014).

Data Analysis

All data in the datasets were manually screened for missing data and obvious data entry errors. The entries for each variable were double-checked by the researcher. Original forms (demographic information and CCEI) were used to verify entries.

Research Questions 1 and 2 were examined with descriptive statistics. Frequencies were used to assess categorical variables (race, gender, health care work experience, simulation experience, repeated a nursing course, primary language) to determine how many participants and the percent of participants that gave each response. Descriptive statistics were used to assess the continuous variables (age, GPA, HESI scores and clinical judgment scores) to determine how many participants responded, the range of responses, the mean, and the standard deviation of each for each variable. The results were analyzed for skewness and kurtosis of the distribution.

Descriptive analysis of data, such as mean, median, mode, range, and frequency distributions were generated using SPSS to further assess for potential entry errors.

Independent samples t-tests and one-way analysis of variance was used to determine if there were statistically significant differences in CCEI total and subscale mean scores of students based on demographics (age, gender, ethnicity, and work experience). Correlational coefficients were used to examine the relationships described in Research Question 4. Correlation was used to determine the degree to which the total CCEI and the subscale scores were related to the participants' HESI™ (E2) scores as well as GPA. It also determined the strength and direction of each of these relationships (Pallant, 2016). Descriptive statistics were used to compute the mean subcategory scores based on Tanner's Clinical Judgment Model (2006) by realigning the CCEI items as described in Chapter 1. An Independent samples t-test was used to determine statistically significant differences in mean scores for males and females. The relationship between Tanner's subcategories and HESI™ (E2) were explored using correlation coefficients.

CHAPTER FOUR: RESULTS

The purpose of this research study was to explore the relationships among demographics, work experience, academic performance and clinical judgment of fourth semester senior BSN students. This chapter presents a description of the sample and the statistical analysis related to each research question.

Description of Sample

A total of 110 fourth semester senior BSN students were invited to participate in the study. One hundred and eight of these students agreed to participate. The researcher observed each simulation live and by video recording and completed the CCEI.

Demographic Characteristics

Demographic data included age, gender, ethnicity, employment status, raised in the United States, and English as first language. Of the 108 participants, 97.2% were raised in the United States and 98.1% reported English as their first language. The majority of the sample was female (88.3%). Most participants (88.9%) were between the ages of 18 and 25 years. The majority of participants (78.7%) were Caucasian, while African Americans made up 13%, and 8.4% classified themselves as “other.” Most participants (58%) were employed, and of those employed, 36% were employed in healthcare. Demographic data is presented in Table 3.

Table 3

Demographic Characteristics of Participants (n=108)

Characteristics	n	%
Gender		
Female	90	83
Male	18	17
Age		
18-25	96	89
≥ 26	12	11
Ethnicity		
African American	14	13
Caucasian	85	79
Other*	9	8
Employment Status		
Unemployed	45	42
Employed in Health care	39	36
Employed not in Health care	24	22
Excluding clinical rotations, experience with direct patient care		
None	35	32
< 3 months	17	16
4 to 6 months	27	25
7 to 12 months	16	15
> 12 months	13	12
Excluding clinical hours number of hours worked per month in direct patient care		
< 12 hours	78	72
13 to 24 hours	16	15
25 to 48 hours	7	7
> 48 hours	7	7

*Asian, Hispanic, and Indian American collapsed into one category

Academic Characteristics

Academic characteristics included GPA, HESI™(E2) scores, and self-report of whether the participant had to repeat a nursing course. The mean GPA of the sample was 2.989 (based on a 4.0 scale) and the range of grades varied between 2.15 and 3.88. The mean score on the HESI™(E2) was 856, which indicated the students are likely to pass NCLEX-RN. However, like GPA, there was a considerable variation in scores. These results are summarized in Table 4.

Table 4

Mean GPA and HESI™(E2)

	n	Mean	SD	Minimum	Maximum
GPA	108	2.99	.32	2.15	3.88
Raw HESI™(E2)	108	856.19	107.85	626.00	1118.00

Research Questions

Research question one was: What is the level of clinical judgment of fourth semester BSN students during a synthesis simulation as measured by the CCEI?

The CCEI total scores and subscale scores were the percent of the items each student performed correctly. Some items on the CCEI were not applicable to some participants depending on the actions they took during the synthesis simulation experience. Because some items were deemed not applicable, the total number of items each student had an opportunity to perform varied slightly, so scores were adjusted accordingly. The possible range of scores for the total CCEI was 0 to 100%. The higher the score, the higher the clinical judgment. Table 5 provides the detailed descriptive data on the total CCEI scores. The mean total CCEI score was 69.6% (SD 12.75). This demonstrates that most students scored above the midpoint of a total

possible score of 100%. The total scores for the participants ranged from 40 to 90%. The data revealed a slight negative skewness (-.311), indicating that there is an overconcentration of higher scores than lower scores.

Research Question Two was: What were the scores on the subscales of the CCEI (assessment, communication, clinical judgment, and patient safety) during a synthesis simulation with fourth semester BSN students? Each subscale had a score range of 0 to 100%. Table 5 provides the detailed descriptive data for the 108 participants on the CCEI subscales. The mean score for the assessment subscale was 77.2 (SD = 20.20) with a range from 0 to 100. The mean score for the communication subscale was 63.1 (SD = 14.78) with a range of 40 to 100. The mean score for the clinical judgment subscale was 70.6 (SD = (20.80) with a range of 10 to 100. The mean score for the patient safety subscale was 69.9 (SD = 15.94) with a range of 30 to 100. All the subscale scores were slightly skewed to the left, but had a skewness within +/- 1.00, indicating that scores were approximately normally distributed (Pallant, 2016).

Table 5

CCEI Subscale and Total Scores

CCEI	M	SD	N	Minimum	Maximum
Total	69.6	12.75	108	40	90
Assessment	77.2	20.20	108	0	100
Communication	63.1	14.78	106	40	100
Clinical Judgment	70.6	20.80	106	10	100
Patient Safety	69.9	15.94	103	30	100

Research Question Three was: What is the relationship between demographics of the students (age, race, gender, and work experience) and CCEI total and subscale scores?

There was no analysis completed for age or primary language because of limited variability in these characteristics. The overwhelming majority (89%) of participants reported being between 18 and 25 years of age and English being their primary language (98%). The findings from the detailed statistical analysis for the remaining variables are found in Tables 6, 7, and 8.

An independent samples t-test was performed to compare the total CCEI scores and the CCEI subscale scores between males and females (See table 6). The analysis revealed that CCEI total scores were statistically different between males ($M = 75.5$, $SD = 11.86$) and females ($M = 68.4$, $SD = 12.64$) with males demonstrating higher levels of clinical judgment overall. There were no significant differences between males and females on the CCEI subscales scores except the communication subscale. The independent samples t-test showed that mean CCEI communication subscale scores were significantly higher in males ($M = 71.4$, $SD = 19.80$) when compared to females ($M = 61.4$, $SD = 14.64$). The effect size for the difference in total scores was small (.04) while the effect size for the difference in communication subscales was small (.066). The individual items included on the subscale are: interprofessional communication, patient and significant other communication, documentation, responding to findings by calling the healthcare provider as appropriate, and promoting professionalism.

Table 6

CCEI Subscale and Total Score Differences between Males and Females

CCEI	Gender									
	Male			Female			95% CI Interval for			
	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	Mean Difference	<i>t</i>	<i>df</i>	η^2
Total	75.5	11.86	18	68.4	12.64	90	.007, .135	2.21*	106	.044
Assessment	77.8	19.80	18	77.0	20.39	90	-.097, .111	.141	106	
Communication	71.4	12.81	18	61.4	14.64	88	.027, .174	2.70*	104	.066
Clinical Judgment	77.8	21.56	18	69.1	20.45	88	-.019, .193	1.83	104	
Patient Safety	74.9	16.55	17	68.5	15.71	86	-.020, .147	1.52	101	

* $p < .05$

In order to examine differences in CCEI total and subscale scores between African American and Caucasian participants, an independent samples t-test was conducted. The analysis indicated that there were no significant differences in CCEI total scores or CCEI subscale scores between the two groups (See Table 7). African Americans and Caucasians demonstrated similar clinical judgment during the synthesis simulation.

Table 7

CCEI Subscale and Total Score Differences between African American and Caucasian Participants

CCEI	Ethnicity						95% CI		
	African American			Caucasian			Interval for		
	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	Mean Difference	<i>t</i>	<i>df</i>
Total	70.2	12.72	14	69.5	12.17	85	-.064, .075	.185	97
Assessment	73.8	19.30	14	76.9	61.4	85	-.147, .086	-.518	97
Communication	61.4	14.60	14	63.4	14.79	84	-.104, .085	-.461	96
Clinical Judgment	72.6	21.62	14	70.7	20.24	84	-.098, .136	.319	96
Patient Safety	73.1	15.40	12	69.4	16.00	83	-.061, .134	.743	93

The current study utilized a one way between groups' analysis of variance to explore the impact of work experience on total CCEI and subscale scores (See Table 8). Participants were placed into three groups based on self-reported employment status (group 1: unemployed, group 2: employed in healthcare group 3: employed but not in healthcare). There was no statistical difference in total CCEI scores between the 3 groups. There was a statistically significant difference in the safety subscale: $F(2, 100) = 3.873, p.026$. The effect size using eta squared was small (.071). Post hoc comparison using Tukey HSD indicated that the mean score for employment in healthcare ($M = 73.7, SD = 13.52$) demonstrated a statistically significant

difference from employed not in healthcare ($M = 63.3$, $SD = 15.12$). There were no statistically significant differences between those not employed and those employed in healthcare or those employed but not in healthcare.

Table 8

Relationship between Employment Status and C-CCEI Subscale and Total Scores

CCEI	Employment Status										df	F	p	η^2
	Group 1			Group 2			Group 3							
	Unemployed			Employed in healthcare			Employed non-healthcare							
	M	SD	n	M	SD	n	M	SD	n					
Total	69.8	13.72	45	70.9	11.53	39	67.0	12.90	24	2, 105	.684	.507	.013	
Assessment	74.8	21.5	45	76.9	18.91	39	81.9	19.61	24	2, 105	.979	.379	.018	
Communication	63.7	15.17	45	63.7	13.64	38	60.9	16.21	23	2, 103	.320	.727	.006	
Clinical Judgment	71.0	20.57	43	71.5	19.98	39	68.3	23.14	24	2, 103	.188	.829	.004	
Patient Safety	70.0	17.16	44	73.7	13.52	36	62.3	15.12	23	2, 100	3.803	.026	.071	

Research question four was: What is the relationship between academic indicators (GPA and HESI™ (E2) scores) and CCEI total as well as CCEI subscale scores? The relationships between grade point average (GPA) and CCEI total and CCEI subscale scores were examined using Pearson product-moment correlation coefficient. There were no significant correlations found between GPA and CCEI total or CCEI subscale scores.

The relationships between HESI™ (E2) raw scores and CCEI total and CCEI subscale scores were examined using Pearson product-moment correlation coefficient (See Table 9). There were no strong or medium correlations found between the CCEI total or CCEI subscale scores and HESI™ (E2) scores. There were small correlations found between the HESI™ (E2) raw scores and CCEI total scores as well as CCEI subscales for communication and clinical judgment with $p < .05$.

Table 9

Correlation between HESI™ (E2) Scores and CCEI total and CCEI subscale scores

	CCEI				
	Total	Assessment	Communication	Clinical Judgment	Patient Safety
HESI™(E2) Score	.231*	.056	.213*	.232*	.083
N	108	106	106	103	108

* Correlation is significant at the $<.05$ level (2-tailed)

ANOVA was used to examine whether higher HESI™ (E2) scores were related to CCEI total and CCEI subscale scores (See Table 10). The HESI™ (E2) has been studied for many years to determine how accurately it predicts NCLEX success (Adamson & Young, 2009; Young & Willson, 2012; Langford & Young, 2013). The HESI™ (E2) has been found to be a valid and reliable indicator of NCLEX success. HESI™ (E2) scores were defined using a variation of the eight level Elsevier scoring table (HESI™ (E2) Exam Guide, 2017). The HESI™ (E2) score

levels are used to evaluate the student's readiness to take NCLEX-RN. The three groups were defined in this study as: Group 1: less than 850 (below average probability of passing NCLEX-RN); Group 2: 850 to 900 (average probability of passing NCLEX-RN); and Group 3: greater than 900 (excellent probability to pass NCLEX-RN). The dependent variables were students' CCEI total and CCEI subscale scores. See Table 10 for the means and standard deviations for each of the three groups. Post-hoc comparisons using the Tukey HSD test indicated that the CCEI total mean score for group 3 was significantly higher than group 1. There were no statistically significant differences in total mean scores between groups 3 and 2 or groups 2 and 1. The mean scores on the CCEI communication subscale for group 2 and group 3 were significantly higher than the mean scores for group 1. While group 2 scored higher ($M = 70.4$, $SD = 17.59$) than group 3 ($M = 66.6$, $SD = 14.38$), the difference was not found to be statistically significant. The clinical judgment subscale mean scores were significantly higher for group 3 ($M = 76.9$, $SD = 18.18$) and group 1 ($M = 65$, $SD = 21.33$). There were no statistically significant differences between groups 3 and 2 or groups 2 and 1 on the clinical judgment subscale. There were also no statistically significant differences in the mean scores for the assessment or patient safety subscales. Notably, the results suggest that group 3 scored significantly better on the CCEI communication subscale, CCEI clinical judgment subscale and CCEI total scores than group 1.

Table 10

Means, Standard Deviations, and One-Way Analyses of Variance for the Effects of HESI™ (E2) Score Categories on CCEI Subscale and Total Scores

CCEI	HESI™ (E2)									df	F	p	η²
	Group 1			Group 2			Group 3						
	M	SD	n	M	SD	n	M	SD	n				
		< 850			850 - 900			> 900					
Total	66.2	13.1	56	74.1	12.1	14	72.9	11.2	38	2, 105	4.442	.014	.078
Assessment	75.8	17.4	56	81.0	21.5	14	78.1	23.6	38	2, 105	.449	.540	.008
Communication	58.7	13.0	54	70.4	17.6	14	66.6	14.4	38	2, 103	5.578	.005	.098
Clinical Judgment	65.0	21.3	55	75.5	20.4	14	76.9	18.2	14	2, 103	4.337	.016	.078
Patient Safety	68.6	16.4	53	71.7	14.5	37	69.9	15.9	36	2, 100	.239	.788	.005

Research question five was: What is the relationship between demographics of the student and academic indicators and the scores on Tanner’s subcategories of clinical judgment using the CCEI items? Based on the proposed model for relating CCEI items to Tanner’s (2006) Clinical Judgment Model (see Chapter 1), scores for noticing, interpreting, responding, and reflecting were compute (See Table 11). These category scores were then compared to gender and HESI™ (E2) since these were the two variables that demonstrated the greatest effect on clinical judgment when compared to the CCEI subscale scores. The analysis of an independent samples t-test comparing Tanner’s Clinical Judgment Model and gender revealed that the mean scores for males were higher on each of the Tanner categories but the only category with a statistically significant difference was responding (See Table 12). A one-way analysis of variance comparing Tanner category scores and HESI™ (E2) scores indicated there was a statistically significant difference in the responding category. The Tukey HSD, however, demonstrated no statistically significant differences between the three groups.

Table 11

Clinical Judgment Model based on CCEI

CCEI	M	SD	N	Minimum	Maximum
Total	69.6	12.75	108	40	90
Noticing	61.9	18.09	108	25	100
Interpreting	62.1	28.78	108	0	100
Responding	70.4	13.99	108	40	100
Reflecting	99.1	6.77	108	50	100

Table 12

Tanner Category Score Differences between Males and Females

CCEI	Gender						95% CI		
	Male			Female			Interval for		
	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	Mean	<i>t</i>	<i>df</i>
							Difference		
Noticing	67.8	15.55	18	60.7	18.41	90	-2.09-16.31	1.53	106
Interpreting	65.3	31.08	18	61.5	28.45	90	-11.00 -18.59	.51	106
Responding	78.2	11.77	18	68.8	13.93	90	2.42 -16.35	2.67*	106
Reflecting	100	.000	18	98.89	7.41	90	-2.37-4.59	.63	106

* $p < .05$

Research question six was: What are the best predictors of CCEI total scores and CCEI subscale scores? As previously discussed, the strongest predictors for CCEI total scores were male gender and scoring greater than 900 on the HESI™ (E2). There were no indicators that were related to assessment scores. The CCEI assessment subscale score mean was higher than any other subscale score as well as the mean for CCEI total score. The CCEI communication subscale scores were best predicted by male gender and HESI™ (E2) score greater than or equal to 850. The only predictor for the CCEI clinical judgment subscale score was a HESI™ (E2) score greater than 900. Employed in health care was the only indicator related to CCEI patient safety subscale scores. HESI™ (E2) scores over 900 had the strongest relationship to the CCEI total scores as well as two of the four CCEI subscale scores.

Summary

This chapter discussed the statistical findings for each of the research questions. Parametric testing included independent samples t-test and one-way analysis of variance.

Discussion regarding the findings, strengths, and limitations of the study, as well as recommendations for further research are presented in Chapter 5.

CHAPTER FIVE: DISCUSSION

Introduction

This chapter includes a discussion of the findings of the present study related to fourth semester BSN students' demographic and academic characteristics and clinical judgment during a synthesis simulation. In the previous chapter, a discussion and analysis of the data was reported. This chapter presents the discussion of the findings as they relate to the stated research questions, an examination of the limitations, implications for practice, as well as recommendations for future research and concluding statements.

Discussion of Research Findings

The purpose of this study was to examine the relationship between demographics and academic indicators on clinical judgment development. Skillful clinical judgment is essential for the delivery of safe, quality nursing care (Benner, Tanner et al., 2009; Gerdeman, Lux, & Jacko, 2013; Lasater, 2007a; Tanner 2006; Theisen & Sandau, 2013). Clinical judgment development is a strenuous process that involves experiential learning. Judgments are based on specific patient indicators assessed by the nurse. For these reasons, clinical judgment must be taught in situational circumstances based on patient events occurring in patient care environments that are complex and dynamic (Coram, 2016). Nurse educators must explore any characteristics that students may possess that influence the development of clinical judgment, as well as innovative ways to assist students in the development of clinical judgment (Benner Tanner et al., 2009). No studies were found by this researcher that specifically addressed the relationship, if any, between clinical judgment and student demographics or academic performance.

Descriptive statistics included age, gender, ethnicity, and work experience. The characteristics of this sample are similar to those reported in national averages as well as those reported in other studies. Of the 108 participants, 88.9% were between the age of 18 and 25

years. Based on the fact that the participants were enrolled in a traditional BSN option, this was not an unusual finding. The NLN (2014) reported that 82% of student nurses were under the age of 30 years. Hayden, Smiley et al. (2014) reported 55.5% of the participants in the NCSBN national study were between 18 and 24 years and another 28.2% were between 25 and 34 years. In the current study, 98.2% of participants were 18 to 35 years and 1.8% were over 35 years. These are similar findings to the NCSBN national study.

The sample population for the current study was 83.3% female. While this is a high percentage of females, it is not an unexpected finding in the nursing profession, since it is in line with results of other reports and studies. The NLN (2014a) reports that 85% of student nurses in the nation are female. Between 2013 and 2014, 86% of the nurses licensed in the nation were female (National Council of State Boards of Nursing, 2015). Hayden, Smiley et al. (2014) reported that 86.1% of participants in the NCSBN national study were females.

The majority of participants in this study, 78.7%, were Caucasian, while African Americans made up 13% and other made up 8.4 %. The NLN (2014) national study found 72% of nursing students were Caucasian, 12.5% African American and 23% were categorized as other (Hispanic, Asian/Pacific, and Other). The National Council of State Boards of Nursing (NCSBN, 2015) reported that 80.5% of practicing nurses were Caucasian and that 19.5% were an ethnic minority. The NCSBN National Study (Hayden, Smiley et al., 2014) reported very similar percentages (Caucasian = 84.3%, African American = 8.8%, and Other = 8.9%).

Thirty nine (36%) participants in this study reported working in healthcare while in school. Another 24 (22%) reported working but not in healthcare. The largest number of participants reported being unemployed (42%). Carnevale et al. (2015) reported that approximately 70% of college students work while enrolled in school. While the current study

shows less students working in general, it is important to look further at the CCEI total and subscale scores for those working in healthcare compared to those working but not in healthcare and those unemployed.

Research Question One

Clinical judgment was measured by total scores on the CCEI. The total scores indicated that the students had acquired varied levels of clinical judgment. In this study, the overall mean CCEI total scores indicated a limited development of clinical judgment. There were 5 students (5%) that demonstrated excellent clinical judgment. Twenty students (19%) demonstrated good development of clinical judgment, with scores between 80 and 89%. Thirty seven students (34%) demonstrated adequate clinical judgment scores between 70 and 79%. A total of forty six (42%) of students scored less than 70% indicating poor clinical judgment.

Benner, Tanner et al. (2009) asserted that the development of clinical judgment is partially dependent on practical experience; hence, this finding was not surprising among nursing students in this study because they had limited experience. The wide variation in scores may be directly related to students varying knowledge base, life experiences, and clinical experiences.

There are few studies that have used the CCEI to measure competence. The majority of studies that have quantitatively measured clinical judgment have utilized the Lasater Clinical Judgment Rubric (LCJR) and shown that clinical judgment grows with increased clinical experience (Ashcraft et al., 2013; Blum et al., 2010; Fedko & Dreifuerst, 2017; Fenske, Harris, Aebersold, & Hartman, 2013). The range of scores on the LCJR vary between 4 levels including exemplary, accomplished, developing, and beginning. The level of clinical judgment development reported for students varied using the LCJR in the above mentioned studies. A possible explanation for these variances may include a difference in faculty raters. With no

specific simulation performance behaviors identified for each category, evaluators are left to interpret each category individually. Another explanation for such varied scores is that some faculty may compare student performance with other nurses while others compare student performance with other students with similar clinical experiences. Scoring on the CCEI is dependent on the difficulty of the simulation which should be determined by the course objectives. Once the level of difficulty is established, the tool offers the opportunity to identify specific behaviors that are required to earn a score of competent. Based on this, the CCEI offers more flexibility and consistency in scoring.

Research Question Two

The subscale of the CCEI includes four categories: assessment, communication, clinical judgment, and patient safety. In the current study, the mean scores of the subscales for assessment and clinical judgment reflected adequate development for this group of students. The subscales of communication and patient safety indicated limited development for students in the study. The assessment subscale had the highest total mean score followed by clinical judgment, patient safety, and communication.

Communication has been identified by nurse leaders as a weakness among new graduate nurses (Theisen & Sandau, 2013). Specific areas of communication that have been identified as weaknesses are communicating with physicians, health care team members, and patients and their families (Goode, Lynn, Krsek, Bednash, & Jannetti, 2009). These are important findings considering that the AACN has included communication as one of the core competencies for baccalaureate nurse graduates. Verbal and written communication are included in this competency, which incorporates documentation (Interprofessional Education Collaborative, 2016). The communication items with a mean score less than 60% were: communicates

effectively with team and documents clearly, concisely, and accurately. During this simulated experience, students were presented with several opportunities to speak with the primary care provider and other members of the health care team by telephone. After the simulation and debriefing, students were asked to document assessments, actions taken, and patient responses to care in written, narrative format. An alarming finding was that only 3% of students documented clearly, concisely and accurately.

Safety of patients while in the healthcare environment has gained the attention of not only healthcare professionals, but also consumers of healthcare. The ability to predict patient risks and take actions to alleviate the risks are behaviors learned from clinical experiences. These actions require both intuitive and analytic reasoning (DeBourgh & Prion, 2011). In this study, students' performance demonstrated a limited development of patient safety behaviors. Safe patient care included: using patient identifiers, utilizing standardized practices and precautions, including handwashing, administering medications safely, managing technology and equipment, and performing procedures correctly. Students scored lowest on using patient identifiers (25%) and administering medications safely (52%). The findings in this study are similar to the conclusions of Haggard (2013) who found that students were not competent in providing safe effective care when evaluated using the Sweeney-Clark Simulation Rubric. Patient identification and safely administering medications are essential components to practicing safe nursing care. Nursing students should be aware of the negative consequences early in their education surrounding these issues. Nursing faculty have a responsibility to ensure students are educated on safe practices and these behaviors are reinforced during clinical experiences.

Research Question Three

The limited variability in the age and race variables prevented further analysis of how these variables were related to CCEI scores.

There was a statistically significant difference in CCEI total scores and communication subscale scores for males when compared to females with males scoring higher. Although the total number of male participants was small ($n = 18$ or 17%), the number is representative of the current U.S. RN workforce (NLN, 2014a; NCSBN, 2015). It is necessary to interpret statistical differences between male and female participants cautiously considering the small number of male participants.

There are only speculative reasons why these differences exist in this study. Males may have been exposed to more situations in which they had to make decisions in school, work, home, or sports. Bjørk and Hamilton (2011) reported that males scored higher on clinical decision making than females in their study of nurses' perceptions of clinical decision making in clinical practice and differences in decision making when compared to nurse demographics. The male participants were younger and had fewer years of experience on the clinical unit; however, their scores were similar to the scores of nurses who had 10 years of experience on the unit. Marshburn, Engelke, and Swanson (2009) measured performance-based clinical competence using videotaped scenarios portraying high acuity clinical situations in new graduates. The findings revealed that males scored significantly higher on the professional role (communication) scale. There were no studies found that reported confidence levels of male and female nursing students. Blanch et al. (2008) reported statistically significant higher confidence among male medical students when compared to female confidence levels. Differences in male and female behavior has been a subject of interest for many years. Research has demonstrated that males

have stronger motor and analytical skills (Ingallhalikar et al., 2014). It has also been demonstrated that males are more decisive, able to focus on narrow issues for long periods of time without tiring, and have the ability to block out unrelated information and distractions (Tunc et al., 2015). Emergent patient situations, as presented in the two HFS scenarios in this study, required students to be decisive, concentrate on a particular patient circumstance, and circumvent unnecessary information and distractions while making sound clinical judgments.

There were few studies found that reported the effects of nursing students working in healthcare and those only focused on academic success and not clinical judgment. Several studies have found that working in healthcare negatively impacts academics, using GPA and course grades as dependent variables (Hasson, McKenna, & Keeney, 2013; Salmonson & Andrew, 2006). Ironside (2010) found that offering multiple patient simulation experiences which increased exposure improved students clinical judgment over time. Fenske et al. (2013) determined nurses with 1 year or more experience scored higher on the LCJR than those with less than one year experience. Stombaugh and Judd (2014) concluded that students that were working as nursing assistants while in school were more confident in performing basic skills. Manetti (2015) discovered a statistically significant difference in total clinical judgment using the LCJR between students that worked in healthcare and those that did not. The current study did not find any statistically significant differences between total CCEI scores and work experience. Manetti (2015) reported that nursing students that worked in healthcare while in school, had significantly higher clinical judgment scores. In the current study, analysis of variance (ANOVA) revealed a statistically significant difference between the group employed in healthcare and the group employed but no in healthcare. The post hoc Tukey HSD showed

students that reported working in healthcare score statistically higher on the CCEI patient safety subscale.

Patient safety encompasses use of patient identifiers, utilizing standard practices and precautions including handwashing, administering medications safely, and performing procedures correctly. Participants that work in healthcare usually have experiences with identifying patients, using standard precautions/handwashing, and performing procedures. Having the opportunity to watch nurses practice safe patient care, as well as care that is not considered safe, may cultivate safe patient care development in the observer. It is also conceivable that participants in this study that worked in healthcare were certified nursing assistants. Certified nursing assistants (CNAs) receive initial training in basic skills, communication, and injury prevention (Sengupta, Harris-Kojetin & Ejaz, 2010). There are numerous opportunities for CNAs to obtain continuing education through their institution of employment on subjects such as falls prevention, infection control, skin care, aspiration precautions, and communication with patients (Ward, Stewart, Ford, Mullen, & Makic, 2014). This knowledge, as well as experience, may contribute to the statistical difference between those that work in healthcare and those that work but not in healthcare and patient safety scores.

Research Question Four

There was no statistically significant correlation between GPA and CCEI total and subscale scores. The lack of correlation between GPA and clinical judgment may be explained by the fact that GPA reflects academic knowledge and not the ability to make judgments. Students may be knowledgeable and earn a high GPA yet be poor decision makers. As already established, clinical judgment requires many skills including thinking, gathering data, sorting

data, prioritizing, and taking action. Often it is necessary to complete all these skills in emergent situations; however, GPA does not effectively reflect a student's ability to perform these skills.

When comparing HESI™ (E2) results to total clinical judgment and subscale scores, the three groups were statistically different for CCEI total, communication subscale and clinical judgment subscale scores. The strength of the correlation coefficients was weak and demonstrated that total CCEI, communication subscale, and clinical judgment subscale scores increased with higher HESI™ (E2) scores.

No other research studies were found correlating CCEI total and subscale scores and HESI™ (E2) scores. Strickland (2013) found that students that scored well on the LCJR scored significantly better on a HESI™ post simulation content specific test. The faculty scores on the LCJR had a high positive correlation with the HESI™ post simulation content specific test. Hall (2015) examined the effectiveness of high fidelity simulation on Assessment Technology Institute (ATI) content mastery maternal child module and simulation experience. The students that were involved in simulation scored significantly higher on the ATI test. More research is needed to explore the influence that simulation has on clinical judgment development.

Research Question Five

When the CCEI items were aligned with Tanner's Clinical Judgment Model (2006), the only statistically significant difference between males and females was on the responding subscale. Many of the items in this subscale were from the communication subscale on the CCEI. This is not surprising since males also scored significantly higher on the communication subscale of the CCEI.

The Analysis of variance investigating the relationship between HESI™ (E2) scores and Tanner's four subscales demonstrated a statistically significant difference in the three groups'

HESI™ (E2) scores, but this was not supported by the post-hoc Tukey HSD. The subcategory of responding was the closest to statistical significance between group 1 (<850) and group 3 (≥ 900). The CCEI section on responding includes evidence based practice, delegating, performing procedures correctly, among other items. Since the HESI™ (E2) is a NCLEX predictor exam that asks questions requiring students to respond to the situation given in the stem of the question it is not surprising that students with higher HESI™ (E2) scores also had higher scores in Tanner's responding category.

Research Question Six

As previously discussed, the strongest predictors for CCEI total scores were male gender and scoring greater than 900 on the HESI™ (E2). There were no indicators that were related to assessment scores. The CCEI assessment subscale score mean was higher than any other subscale score as well as the mean for CCEI total score. The CCEI communication subscale scores were best predicted by male gender and HESI™ (E2) score greater than or equal to 850. The only predictor for the CCEI clinical judgment subscale score was a HESI™ Exit Exam score greater than 900. Employed in health care was the only indicator related to CCEI patient safety subscale scores. HESI™ Exit Exam scores over 900 had the strongest relationship to the CCEI total scores as well as two of the four CCEI subscale scores.

Limitations

Several limitations of this study were identified. While the sample size (n = 108) was adequate for the research questions as discussed in chapter three, the sample did present several other limitations that affect the generalizability of the findings. The study was limited to a convenience sample of senior BSN students in the last semester of their nursing education at one BSN program in the Southeast United States. While convenience sampling is the most common

method used, it does limit the generalizability of a study (Gliner, Morgan, & Leech, 2017). However, comparison of the sample characteristics to national data demonstrates that the composition is similar to other programs. Utilizing a multisite approach would make the results more generalizable to the population (Gliner, Morgan, & Leech, 2017).

Unintentional rater bias due to fatigue may also have influenced the results since the study utilized only one rater for the 108 participants. Ling, Mollaun, and Xi (2014) performed a study on the impact of fatigue on human raters when scoring speaking responses. The findings demonstrated that fatigue played a role in the accuracy and consistency of raters. Rater bias can be a substantial source of error. Bias will distort observed effect sizes (Gliner, Morgan, & Leech, 2017). Having multiple raters score students and then establishing inter-rater reliability would add rigor to the study and possibly alter the findings (Polit & Beck, 2012).

The didactic instruction that students received prior to the simulation experience may have been a limitation of this study. Students are engaged in didactic instruction on heart failure and angina at three different points in the curriculum. The first introduction of the content is during the first semester of their four semester and two summer session curriculum. During the third semester, this content is taught again in relation to more complex conditions. The students review this content one last time during the capstone synthesis course in their final semester. The researcher was not a member of the teaching teams in the courses in which this information was taught. While the simulation design aimed to represent best practice and was reviewed by current clinical experts, this varied teaching could have altered student learning and hence the findings of the study.

The simulation environment may also have been a limitation in this study. While the purpose of high fidelity simulation is to engage students in a realistic patient situation, the

simulation environment is an imitation of the true patient care environment (Lopreiato et al., 2016). Burbach et al. (2016) identified the lack of non-verbal cues from the simulator as a student barrier to assessment. Students reported feeling restricted in their assessment findings by lack of cues such as skin turgor, sweating, and facial expressions. Relying so heavily on the monitor to identify changes in the patient's condition did not portray optimal patient care. It is debatable whether the same or similar students' behaviors would be evident in an actual clinical setting. Measuring clinical judgment in the clinical setting may have generated different results.

Implications for Nursing

Clinical judgment is essential for the health care environment new nurses are entering into today (NLN, 2003; Lasater 2007a). Clinical judgment advances professional nursing practice and provides the foundation for nurses' actions and safe patient care (AACN, 2008; Johnson et al., 2012; Tanner, 2006). Further attention has been brought to clinical judgment by the American Association of Colleges of Nursing (2008) who included clinical judgment as an essential of baccalaureate education. In addition, the IOM (2010) urged nurse educators to emphasize clinical judgment. This study could help identify variables that influence students' development of clinical judgment, as well as influence the way nursing faculty evaluate the development of clinical judgment in students. It is essential that inadequacies in the development of clinical judgment of students be identified so faculty can address these and improve overall nursing practice and safety of patients.

The NLN's (2012) research priorities in nursing education recommended the "identification and testing of valid and reliable instruments for educational research." This researcher used the CCEI as a viable instrument to measure clinical judgment. Using the CCEI

adds knowledge about accessible instruments available to measure clinical judgment. Proper use of the instrument requires faculty to identify specific student behaviors to be evaluated adding to the objectivity. This makes it feasible to identify areas of poor student performance, allowing faculty to facilitate the development of clinical judgment of students through debriefing and remediation that addresses the student's specific areas of weakness.

Students need to become familiar with clinical judgment terminology, such as noticing, interpreting, responding, and reflecting. Clinical judgment language should be included in the overall curriculum and taught in the educational process. Understanding the dimensions of clinical judgment may improve students' performance in simulation as well as in the actual clinical setting. Faculty must recognize the importance of including clinical judgment in the curriculum and find creative ways to teach this concept.

The development of clinical judgment is a process that increases with knowledge and experience (Tanner, 2006); therefore, clinical judgment should be evaluated at various intervals during the nursing curriculum. Introducing opportunities to evaluate clinical judgment early in the curriculum allows faculty to identify individual student progression and intervene early to assist student development. The goal should be to assist students to not only think like a nurse, but to also act like a nurse.

The findings of this research have several implications for nurse educators. Educators should consider using the CCEI to evaluate students' clinical judgment skills and competency level during HFS experiences. This tool will allow educators to quantitatively evaluate students' clinical performance during HFS, thus removing the subjective nature of evaluation. Adopting the CCEI will make it easier to guide the students in their education. The tool compels faculty to enumerate critical behaviors that are essential to safely care for patients presented during

simulated experiences. The specificity of the feedback from the tool guides the student to reflect on their actions, including interventions and outcomes, identify near misses and errors that occurred during the simulation, and identify what was learned during the simulation such as analyzing basic heart rhythms for cardiac patients (i.e. PVC's) and performing neurological assessment including Glasgow Coma Scale for a head injury patient. Utilizing the CCEI would make it possible for both faculty and students to evaluate performance and clinical judgment in a situational learning environment, while identifying strengths and weaknesses.

Nursing programs that are effective prepare students to manage care of complex patients by teaching higher level thinking like clinical judgment. There are many reasons to use the CCEI to teach and evaluate clinical judgment as previously stated. In this study, students' clinical judgment scores during HFS was associated with higher HESI™ (E2) scores. It has been documented that HESI™ (E2) has a 96 to 99% estimated predictability on NCLEX success. Nurse educators should be committed to teaching and evaluating clinical judgment through HFS using the CCEI to identify students who are at risk of performing poorly on HESI™ (E2) thereby initiating early remediation for increased success. This also offers a means to better prepare students for HESI™ (E2) and NCLEX as well as for practice.

Recommendations for Future Studies

Based on the results and implications of this study, several future studies are suggested. Generalizability of the findings of the current study are limited. This study utilized a convenience sample from one southeastern university. The study could be replicated using multiple schools and universities offering a traditional BSN to increase generalizability of the results.

The current study was conducted during the last semester of the participants' nursing education and did not investigate whether there was a change in clinical judgment scores after completing the simulation. Replication of this study with an extended longitudinal design using various HFS scenarios and comparing student performance with HESI specialty exam outcomes should be examined. Beginning HFS with first semester BSN students and continuing throughout the nursing curriculum would increase understanding of the development of clinical judgment.

In addition, the university could partner with the local medical facility to follow students that are hired as new graduates and ultimately reevaluate their clinical judgment scores using the CCEI during their first year of employment as an RN. This would help investigate nurses' success in the clinical setting and establish the relationship, if any, between clinical judgment scores and clinical success in an acute care setting.

More research is needed to determine how to most effectively evaluate clinical judgment development in students. The Lasater Clinical Judgment Rubric (Lasater, 2007b) is the tool most often cited in the simulation literature. The LCJR was developed based on Tanner's clinical judgment model (2006). The tool does not lend itself to identifying specific actions to be taken by the student in each of the subcategories for scoring purposes. This study used the CCEI, which is a competency instrument to score clinical judgment. There are no studies using the CCEI to measure clinical judgment. The CCEI provides a means of making the items more objective in nature by allowing the faculty to identify specific actions for each item that must be performed. The actions can be modified based on individual scenarios. Further research to develop the reliability and validity of the CCEI as a clinical judgment instrument could make it

possible to more objectively measure clinical judgment during HFS and possibly during clinical rotations.

Finally, future studies should be conducted with groups of students that have greater ethnic diversity and a wider age range. Having a majority of participants identify as Caucasian (79%) and being between the ages of 21 and 25 years (86%) made it impossible to draw conclusions about ethnicity and the development of clinical judgment.

Conclusion

The purpose of this study was to explore the relationship between demographic and academic indicators and clinical judgment using the CCEI of fourth semester senior BSN students. Age, race, gender, work experience, GPA and HESI™ (E2) scores were presented as influencing factors on clinical judgment scores. The only factors found in this study that influenced clinical judgment were gender and HESI™ (E2) scores.

The use of HFS continues to expand in nursing education curricula. Members of nursing faculty should see HFS as an innovative teaching method that assists students with the development of clinical judgment skills. Most of the research that has been completed on the development of clinical judgment in nursing students has been done using the LCJR. The CCEI is a tool that can be utilized by faculty to objectively measure clinical judgment and provide meaningful feedback to students.

REFERENCES

- Aebersold, M. & Tschannen, D (2013). Simulation in nursing practice: The impact on patient care. *The Online Journal of Issues in Nursing* 18(2). Retrieved from: <http://nursingworld.org/MainMenuCategories/ANAMarketplace/ANAPeriodicals/OJIN/TaleofContents/Vol-18-2013/No2-May-2013/Simulation-in-Nursing-Practice.html>
- Adamson, C. & Britt, R. (2009). Repeat testing with the HESI Exit Exam—Sixth validity study. *Computers, Informatics, Nursing*, 27(6), 393–397. doi: 0.1097/NCN.0b013e3181bcae08
- Adamson, K. (2011). Assessing the reliability of simulation evaluation instruments used in nursing education: A test of concept study (Order No. 3460357). Available from ProQuest Dissertations & Theses Global. (876963327). Retrieved from <http://search.proquest.com.jproxy.lib.ecu.edu/docview/876963327?accountid=10639>
- Adamson, K., Gubrud, P., Sideras, S., & Lasater, K. (2012). Assessing the reliability, validity, and use of the Lasater Clinical Judgment Rubric: Three approaches. *Journal of Nursing Education* 51(2), 66-73. doi:10.3928/01484834-20111130-03
- Alfaro-Lefevre, R. (2017). *Critical thinking, clinical reasoning and clinical judgment: A practical approach* (6th ed.). Philadelphia, PA: Elsevier.
- Alinier, G. (2011). Developing high-fidelity health care simulation scenarios: A guide for educators and professionals. *Simulation & Gaming*, 42(9), 9-26. doi:10.1177/1046878109355683
- Alinier, G., Hunt, B., Gordon, R. & Harwood, C. (2006). Effectiveness of intermediate-fidelity simulation training technology in undergraduate nursing education. *Journal of Advanced Nursing*, 34(3), 359-369. doi:10.1111/j.1365-2648.2006.03810.x
- American Association of Colleges of Nursing. AACN (2008) *Essentials of Baccalaureate Education for Professional Nursing Practice*. Retrieved from <http://www.aacn.nche.edu/education-resources/BaccEssentials08.pdf>
- American Association of Colleges of Nursing. AACN (1998). *The Essentials of Baccalaureate Education for Professional Nursing Practice*. Washington, DC: Author. Retrieved from: <http://www.aacn.nche.edu/ccne-accreditation/BSNEssentials1998.pdf>
- Aschenbrenner, D. S., Milgrom, L. B., & Settles, J. (2012). Designing simulation scenarios to promote learning. In P. Jeffries (Ed.), *Simulation in nursing education: From conceptualization to evaluation* (2nd ed.). (pp. 43-74). New York: National League for Nursing.
- Ashcraft, A. S., Opton, L., Bridges, R. A., Caballero, S., Veasart, A., & Weaver, C. (2013). Simulation evaluation using a modified Lasater clinical judgment rubric. *Nursing Education Perspectives*, 34(2), 122-126.

- Ashley, J. & Stamp, K. (2014). Learning to think like a nurse: The development of clinical judgment in nursing students. *Journal of Nursing Education* 53(9), 519-525. doi:10.3928/01484834-20140821-14
- Ballie, L. & Cruzio, J. (2009). Students' and facilitators' perception of simulation in practice learning. *Nursing Education in Practice*, 9(5), 297-306. doi:10.1016/j.nepr.2008.08.007
- Bambini, D., Washburn, J., and Perkins, R. (2009). Outcomes of clinical simulation for novice nursing students: Communication, confidence, clinical judgment. *Nursing Education Perspectives*, 30(2), 79-82.
- Baxter, P. & Rideout, E. (2006). Second year baccalaureate nursing students' decision making in the clinical setting. *Journal of Nursing Education* 45(4), 121-127.
- Benner, P., Sutphen, M., Leonard, V., & Day, L. (2009). *Educating nurses: A Call for Radical Transformation*. Stanford, CA: The Carnegie Foundation for Advancement of Teaching and Jossey-Bass.
- Benner, P., Tanner, C., & Chesla, C. (2009). *Expertise in nursing practice: Caring, clinical judgment and ethics* (2nd ed.). New York, NY: Springer Publishing Company.
- Berkow, S., Virkstis, K., Stewart, J., & Conway, L. (2009). Assessing new graduate nurse performance. *Nurse Educator*, 34(1), 17-22. doi:10.1097/01.NNE.0000343405.90362.15
- Birch, L., Jones, N., Doyle, P., Green, P., McLaughlin, C., Champney, C., ... Taylor, K. (2007) Obstetrics skills drills: Evaluation of teaching methods. *Nurse Education Today* 27(8), 915-922. doi:10.1016/j.nedt.2007.01.006
- Bjørk, I., & Hamilton, G. (2011). Clinical decision making of nurses working in hospital settings. *Nursing Research and Practice*, 2011, Article ID 524918, 1-8. doi:10.1155/2011/524918
- Blanch, D., Hall, J., & Frankel, R. (2008). Medical student gender and issues of confidence. *Patient Education and Counseling*, 72(3), 374-381. doi: 10.1016/j.pec.2008.05.021
- Blum, C., Borglund S., & Parcells, D. (2010). High fidelity 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
- Bradley, P. (2006). The history of simulation in medical education and possible future directions. *Medical Education*, 40 (3), 254-262. doi:10.1111/j.1365-2929.2006.02394.x
- Brannan, J., White, A., & Bezanson, J. (2008). Simulator effects on cognitive skills and confidence levels. *The Journal of Nursing Education*, 47(11), 495-500.

- Brudvig, T. J., Dirkes, A., Dutta, P., & Rane, K. (2013). Critical thinking skills in health care professional students: A systematic review. *Journal of Physical Therapy Education* 27(3), 12-25.
- Buerhaus, P. (2008). Current and future state of the US nursing workforce. *Journal of American Medical Association*, 300(20), 2422-24. doi:10.1001/jama.2008.729
- Burbach, B. E., Thompson, S. A., Barnason, S. A., Wilhelm, S. L., Kotcherlakota, S., Miller, C. L., & Paulman, P. M. (2016). Student-perceived influences on performance during simulation. *Journal of Nursing Education*, 55(7), 396-398. doi:10.3928/01484834-20160615-07
- Bureau of Labor Statistics (2015). U.S. Department of Labor, Occupational Outlook Handbook, 2016-17 Edition, Registered Nurses. Retrieved from: <http://www.bls.gov/ooh/healthcare/registered-nurses.htm>
- Buykx, P., Kinsman, L., Cooper, S., McConnell-Henry, T., Cant, R., Endacott, R., & Scholes, J. (2011). FIRST2ACT: Educating nurses to identify patient deterioration – a theory based model for best practice simulation education. *Nurse Education Today* 31(7), 687-693. doi:10.1016/j.nedt.2011.03.006
- Cardoza, M. and Hood, P. (2012). Comparative study of baccalaureate nursing student self-efficacy before and after simulation. *Computer, Informatics, Nursing*, 30(3), 142-147. doi:10.1097/NCN.0b013e3182388936
- Cazzell, M. & Anderson, M. (2016). The impact of critical thinking on clinical judgment during simulation with senior nursing students. *Nursing Education Perspective*, 37(2). 83-90. doi: 10.5480/15-1553
- Christian, A. & Krumwiede, N (2013). Simulation enhances self-efficacy in the management of preeclampsia and eclampsia in obstetrical staff nurses. *Clinical Simulation in Nursing*, 9(9), e369-e377. doi:10.1016/j.ecns.2012.05.006
- Coram, C. (2016). Expert role modeling effect on novice nursing students' clinical judgment. *Clinical Simulation in Nursing*, 12(9), 385-391. doi.org/10.1016/j.ecns.2016.04.009.
- Cronenwett, L., Sherwood, G., Barnsteiner J., Disch, J., Johnson, J., Mitchell, P., Sullivan, D., Warren, J. (2007). Quality and safety education for nurses. *Nursing Outlook*, 55(3)122-131. doi: 10.1016/j.outlook.2007.02.006
- Dawson, S. (2006). Procedure simulation: A primer. *Journal of Vascular Interventional Radiology*, 17(1), 17-25. doi:10.1148/radiol.2411062581
- Dearman, C. (2003). Using clinical scenarios in nursing education. In M.H. Oermann and K. T. Heinrich (Eds.) *Annual review of nursing education* (p. 341-355). New York, NY: Springer Publishing Company, Inc.

- DeBourgh, G., & Prion, S. (2011). Using simulation to teach prelicensure nursing students to minimize patient risk and harm. *Clinical Simulation in Nursing*, e47-e56. doi: 10.1016/j.ecns.2009.12.009
- del Bueno, D. (2005) A crisis in critical thinking. *Nursing Educator Perspectives* 26(5), 278–282.
- Dewey, J. (1933). *How we think: A restatement of the relation of reflective thinking to the education process*. Boston, MA: Heath.
- Dillard, N., Sideras, S., Ryan, M., Carlton, K., 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. doi:10.1043/1536-5026-030.002.0099
- Dunn, K., Osborne, C., & Link, H. (2014). High-fidelity simulation and nursing student self-efficacy: Does training help the little engines know they can? *Nursing Education Perspectives* 35(6), 403-404.
- Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G* Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39(2), 175-191. doi:10.3758/BF03193146
- Fedko, A. S. & Dreifuers, K.T. (2017). Examining the relationship between clinical judgment and nursing actions in prelicensure students. *Nurse Educator*, 42(1), 47-50. doi: 10.1097/NNE.0000000000000290
- Fenske, C. L., Harris, M. A., Aebbersold, M. L., & Hartman, L. S. (2013). Perception versus reality: A comparative study of the clinical judgment skills of nurses during a simulated activity. *Journal of Continuing Education in Nursing*, 44(9), 399-405. doi:10.3928/00220124-20130701-67
- Ferguson, L., Myrick, F., and Yonge, O. (2006). Ethically involving students in faculty research. *Nurse Education Today*, 26(8), 705-711. doi:10.1016/j.nedt.2006.07.021
- Fero, L., Witsberger, C., Wesmiller, S., Zullo, T., and Hoffman, L. (2009). Critical thinking ability of new graduate and experienced nurses. *Journal of Advanced Nursing*, 65(1), 139-148. doi: 10.1111/j.1365-2648.2008.04834.x
- FERPA (2014). Family Educational Rights and Privacy Act (FERPA) Guidance. Retrieved from www.research.uky.edu/ori/ORIForms/31-FERPA-Summary.pdf
- Gantt, L. (2012). Who's driving? The role and training of the human patient simulation operator. *Computers, Informatics, Nursing*, 30(11), 579-586. doi:10.1097/NXN.0b013e318266ca52

- Gates, M., Parr, M. & Huguen, J. (2012). Enhancing nursing knowledge using high-fidelity simulation. *Journal of Nursing Education*, 51(1), 9-15. doi:10.3928/01484834-20111116-01
- Gerdeman, J., Lux, K., & Jacko, J. (2013) Using concept mapping to build clinical judgment skills. *Nurse Education in Practice*, 3(1), 1-17. doi:10.1016/j.nepr.2012.05.009
- Gillespie, M. and Peterson, B. (2009). Helping novice nurses make effective clinical decisions: The situated clinical decision-making framework. *Nursing Education Perspectives*, 30(3), 164-170.
- Gliner, J., Morgan, G., & Leech, N. (2017). *Research methods in applied settings and integrated approach to design and analysis*. (3rd ed.). New York, NY: Routledge.
- Gobbi, M., Monger, E., Weal, M., McDonald, J., Michaelides, D., & De Roure, D. (2012). The challenges of developing and evaluating complex care scenarios using simulation in nursing education. *Journal of Research in Nursing* 17(4) 329–345. doi:10.1177/1744987112449969
- Goode, C., Lynn, M., Krsek, C., Bednash, G., & Jannetti, A. (2009). Nurse residency programs: An essential requirement for nursing. *Nursing Economics*, 27(3), 142-147.
- Grantcharov, T, Kristiansen, V, Bendix, J., Bardrum, L., Rosenberg, J., & Funch-Jensen, P. (2004). Randomized clinical trials of virtual reality simulation for laparoscopic skills training. *British Journal of Surgery*, 91(2), 146-150. doi:10.1002/bjs.4407
- Gubrud-Howe, P. (2008). Development of clinical judgment in nursing students: A learning framework to use in designing and implementing simulated learning experiences (Doctoral dissertation). Available from ProQuest Dissertations and Theses database (3343767).
- Haggard, L. (2013). High-fidelity simulation and safety competency of nursing students. (Order No. 3567850). Available from ProQuest Dissertation & Thesis Global. ((1418014914). Retrieved from <http://search.proquest.com.jproxy.lib.ecu.edu/docview/1418014914?accountid=10639>
- Hall, S. (2015). High-fidelity simulation for senior maternity nursing students. *Nursing Education Perspectives*, 36(2), 124-126. doi:10.5480/12-996.1
- Hasson, F., McKenna, H., & Keeney, S. (2013). A qualitative study exploring the impact of student nurses working part time as a health care assistant. *Nursing Education Today*, 33(8), 873-879. doi: 10.1016/j.nedt.2012.09.014

- Hayden, J. K., Keegan, M., Kardong-Edgren, S., & Smiley, R.A. (2014). Reliability and validity testing of the Creighton Competency Evaluation Instrument for use in the NCSBN National Simulation Study. *Nursing Education Perspectives*, 35(4), 244-252 doi:10.5480/13-1130.1
- Hayden, J., Smiley, R., Alexander, M., Kardong-Edgren, S, and Jeffries, P. (2014). The NCSBN national simulation study: A longitudinal, randomized, controlled study replacing clinical hours with simulation in prelicensure nursing education. *Journal of Nursing Regulation*, 4(2), S4-S41.
- Imanipour, M. & Jalili, M. (2015). Development of a comprehensive clinical performance assessment system for nursing students: A programmatic approach, *Japan Journal of Nursing Science*, 13(1), 46-54. doi:10.1111/jjns.12085
- Ingalhalikar, M., Smith, A., Parker, D., Satterthwaite, T., Elliott, M., Ruparel, K., ... Verma, R. (2014). Sex differences in the structural connectome of the human brain. *Proceedings of the National Academy of Sciences of the United States of America*, 111(2), 823-828. doi: 10.1073/pnas.1316909110.
- Institute of Medicine (IOM) (2010). *Future of nursing: Leading change and advancing health*. Retrieved from <http://www.nacns.org/docs/toolkit/5-IOM-Report.pdf>
- Interprofessional Education Collaborative. (2016). Core competencies for interprofessional collaborative practice: 2016 update. Washington, DC: Interprofessional Education Collaborative. Retrieved from https://ipecollaborative.org/uploads/IPEC-2016-Updated-Core-Competencies-Report__final_release_.PDF
- Ironside, P. (2010). Using multiple-patient simulation experiences to foster clinical judgment. *Journal of Nursing Regulation*, 1(2), 38-41. doi: 10.1016/S2155-8256(15)30349-5
- Ironside, P., Jeffries, P. & Martin, A. (2009) Fostering patient safety competencies using multiple-patient simulation experiences. *Nursing Outlook*, 57(6), 332-337. doi:10.1016/j.outlook.2009.07.010
- James, J., (2013). A new, evidence-based estimate of patient harms. *Journal of Patient Safety*, 9 (3), 122-128. doi:10.1097/PTS.0b013e3182948a69
- Jeffries, P. (2005). A framework for designing, implementing, and evaluating simulations used as teaching strategies in nursing. *Nursing Education Perspectives*, 26(2), 96-103.
- Jeffries, P. (2006). Designing simulations in nursing education. In M.H. Oermann and K. T. Heinrich (Eds.). *Annual review of nursing education* (p. 161-171). New York, NY: Springer Publishing Company, Inc.

- Jeffries, P. & Rizzolo, M. (2006). *Designing and implementing models for the innovative use of simulation to teach nursing care of ill adults and children: A national, multi-site, multi-method study*. NLN Summary Report. New York, NY: National League for Nursing.
- Jeffries, P. R., & Rogers, K. J. (2012). Theoretical framework for simulation design. In P. Jeffries (Ed.). *Simulation in nursing education: From conceptualization to evaluation* (2nd ed.). (pp. 25-42). New York: National League for Nursing.
- Johnson, D., and Johnson, S. (2014). The effects of using a human patient simulator compared to a CD-ROM in teaching critical thinking and performance. *U.S. Army Medical Department Journal*, 59-64.
- Johnson, E. A., Lasater, K., Hodson-Carlton, K., Siktberg, L., Sideras, S., & Dillard, N. (2012). Geriatrics in simulation: Role modeling and clinical judgment effect. *Nursing Education Perspectives*, 33(3), 176-180. doi:10.5480/1536-5026-33.3.176
- Kameg, K., Howard, V., Clochesy, J., Mitchell, A., Suresky, J. (2010). The impact of high fidelity human simulation on self-efficacy of communication skills. *Issues in Mental Health Nursing*, 31(5), 315-323. doi:10.3109/01612840903420331
- Kantar, L. and Alexander, R. (2012). Integration of clinical judgment in the nursing curriculum: Challenges and perspectives. *Journal of Nursing Education*, 51(8), 444-453. doi:10.3928/01484834-20120615-03
- Langford, R., & Young, A. (2013). Predicting NCLEX-RN success with the HESI Exit Exam: Eighth validity study. *Journal of Professional Nursing*, 29(2), S5-S9. doi: 10.1016/j.profnurs.2012.06.007
- Lasater, K. (2007a). High-fidelity simulation and the development of clinical judgment: Students' experience. *Journal of Nursing Education*, 46(6), 269-276.
- Lasater, K. (2007b). Clinical judgment development. Using simulation to create an assessment rubric. *Journal of Nursing Education*, 46(11), 496-503. doi:10.1016/j.ccell.2008.08.005
- Lasater, K. (2011). Clinical judgment: The last frontier for evaluation. *Nurse Education in Practice*, 11(2), 86-92. doi:10.1016/j.nepr.2010.11.013
- Larew, C., Sessans, S., Spunt, D., Foster, D. and Covington, B. (2005). Innovations in clinical simulation: Application of Benner's theory in an interactive patient care simulation. *Nursing Education Perspectives*, 27(1), 16-21.
- Lee, J., Lee, Y., Lee, S., & Bae, J. (2016). Effects of high-fidelity patient simulation led clinical reasoning course: Focused on nursing core competencies, problem solving, and academic self-efficacy. *Japan Journal of Nursing Science*, 13(1), 20-28. doi:10.1111/jjns.12080

- Levett-Jones, T., Hoffman, K., Dempsey, J., Yeun-Sim Jeong, S., Noble, D., Norton, C....& Hickey, N. (2010). The 'five rights' of clinical reasoning: An educational model to enhance nursing students' ability to identify and manage clinically 'at risk' patients. *Nurse Education Today* 30(6), 515–520. doi:10.1016/j.nedt.2009.10.020
- Lindsey, L. & Jenkins, S. (2013). Nursing students' clinical judgment regarding rapid response: The influence of a clinical simulation education intervention. *Nursing Forum*, 48(1), 61-70. doi:10.1111/nuf.12002
- Ling, G., Mollaun, P., & Xi, X. (2014). A study on the impact of fatigue on human raters when scoring speaking responses. *Language Testing*, 31(4), 479-499. doi: 10.1177/0265532214530699
- Lopreiato, J. O. (Ed.), Downing, D., Gammon, W., Lioce, L., Sittner, B., Slot, V., Spain, A. E. (Associate Eds.), and the Terminology & Concepts Working Group. (2016). Healthcare Simulation Dictionary. Retrieved from: <http://www.ssih.org/dictionary>
- Manetti, W. G. (2015). Clinical judgement in baccalaureate pre-licensure nursing students (Order No. 3701058). Available from ProQuest Dissertations & Theses Global. (1680835348). Retrieved from <http://search.proquest.com.jproxy.lib.ecu.edu/docview/1680835348?accountid=10639>
- Marshburn, D., Engelke, M. & Swanson, M. (2009). Relationships of new nurses' perceptions and measured performance-based clinical competence. *The Journal of Continuing Education in Nursing*, 40(9), 426-432. doi: 10.3928/00220124-20090824-0
- Morton, P. (1995). Creating a laboratory that simulates the critical care environment. *Critical Care Nurse*, 16(6), 76-81.
- Mould, J., White, H. & Gallagher, R. (2011). Evaluation of a critical care simulation series for undergraduate nursing students. *Contemporary Nurse*, 38(1-2), 180-190.
- Myers, S., Reidy, P., French, B., McHale, J., Chisholm, M., and Griffin, M. (2010). Safety concerns of hospital-based new-to-practice registered nurses and their preceptors. *The Journal of Continuing Education in Nursing* 41(4), 163-171. doi:10.3928/00220124-20100326-02
- National Council of State Boards of Nursing (2015). National Nursing Workforce Study. Retrieved from: <https://www.ncsbn.org/workforce.htm>
- National League for Nursing (2003). *Innovation in Nursing Education: A Call to Reform*. (Position Statement) Retrieved from <http://www.nln.org/docs/default-source/about/archived-position-statements/innovation-in-nursing-education-a-call-to-reform-pdf.pdf?sfvrsn=4>

- National League for Nursing (2006). *Designing and Implementing Models for the Innovative Use of Simulation to Teach Nursing Care of Ill Adults and Children: A National, Multi-Site, Multi-Method Study*. (Summary Report) Retrieved from <http://www.nln.org/docs/default-source/professional-development-programs/read-the-nln-laerdal-project-summary-report-pdf.pdf?sfvrsn=0>
- National League of Nursing. (2012). *NLN research priorities in nursing education: 2012-2015*. Retrieved from: <https://www.mnrs.org/sites/default/files/downloads/2015/NLN%20-%20Research%20Priorities%20%28Criteria%29.pdf>
- National League for Nursing (2012). *NLN Vision: Transforming Research in Nursing Education*. Retrieved from: [http://www.nln.org/docs/default-source/about/nln-vision-series-\(position-statements\)/nlnvision_5.pdf?sfvrsn=4](http://www.nln.org/docs/default-source/about/nln-vision-series-(position-statements)/nlnvision_5.pdf?sfvrsn=4)
- National League for Nursing (2014). Enrollments in Nursing Programs 2013-2014. *Percentage of students over Age 30 by program type*. Retrieved from: www.nln.org/newsroom/nursing-education-statistics/enrollments-in-nursing-programs
- National League for Nursing (2016a). *Mission and Goals*. Retrieved from <http://www.nln.org/about/mission-goals>
- National League for Nursing (2016b). *NLN Research Priorities in Nursing Education 2016 – 2019*. Retrieved from: <http://www.nln.org/docs/default-source/professional-development-programs/nln-research-priorities-in-nursing-education-single-pages.pdf?sfvrsn=2>
- Nehring, W. & Lashley, F. (2009). Nursing simulation: A review over the past 40 years. *Simulation and Gaming*, 40(4), 528-552. doi:10.1177/1046878109332282
- Pallant, J. (2016). *SPSS survival manual: A step by step guide to data analysis using SPSS* (6th ed.). Berkshire, England: Open University Press/McGraw-Hill.
- Pilcher, J., Goodall, H., Jensen, C., Huwe, V., Jewell, C., Reynolds, R., & Karlsen, K., (2012). Special focus on simulation: Educational strategies in the NICU: Simulation-based learning: It's not just for NRP. *Neonatal Network*, 31(5), 281-287. doi:10.1891/0730-0832.31.5.281
- Polit, D., and Beck, C. (2012). *Nursing research: Generating and assessing evidence for nursing practice* (9th ed.). Philadelphia, PA: Lippincott, Williams and Wilkins.
- Presti, C. R. (2016). The flipped learning approach in nursing education: A literature review. *Journal of Nursing Education*, 55(5), 252-257. doi:10.3928/01484834-20160414-03
- Prescott, S. & Garside, J. (2009). An evaluation of simulated clinical practice for adult branch students. *Nursing Standard*, 23(1), 35-40. doi: 10.7748/ns2009.02.23.22.35.c6776

- Radhakrishnan, K., Roche, J. and Cunningham, H. (2007). Measuring clinical practice parameters with human patient simulation: A pilot study. *Journal of Nursing Education*, 4(1), 1-11. doi: 10.2202/1548-923X.1307
- Roh, Y. S., Lim, E. J., & Issenberg, S. B. (2014). Effects of an integrated simulation-based resuscitation skills training with clinical practicum on mastery learning and self-efficacy in nursing students. *Collegian*, 23(1). 53-59. doi:10.1016/j.colegn.2014.10.002
- Salmonson, Y., & Andrew, S. (2006). Academic performance in nursing students: Influence of part-time employment, age, and ethnicity. *Journal of Advanced Nursing*, 55(3), 342–351. doi: 10.1111/j.1365-2648.2006.03863_1.x
- Schubert, C. (2012). Effect of simulation on nursing knowledge and critical thinking in failure to rescue events. *Journal of Continuing Education in Nursing*, 43(10), 467-471.
- Sengupta, M. Harris-Kojetin, L. & Ejaz, F. (2010). A national overview of the training received by certified Nursing assistants working in U.S. nursing homes. *Gerontology & Geriatrics Education*, 31(3), 201-219. doi: 10.1080/02701960.2010.503122
- Shamoo, A., and Resnik, D. (2009). *Responsible conduct of research* (2nd ed). Oxford, NY: Oxford University Press.
- Shinnick, M., & Woo, M. (2014). Does nursing student self-efficacy correlate with knowledge when using human patient simulation? *Clinical Simulation in Nursing*, 10(2), e71-e79. doi:10.1016/j.ecns.2013.07.006
- Sideras, S. (2007). An examination of the construct validity of a clinical judgment evaluation tool in the setting of high-fidelity simulation (Unpublished dissertation). Oregon Health & Science University, Portland, OR. <http://digitalcommons.ohsu.edu/etd/450/>
- Smith, S. and Roehrs, C. (2009). High-fidelity simulation: Factors correlated with nursing students' satisfaction and self-confidence. *Nursing Education Perspectives*, 30(2), 74-78.
- Stombaugh, A., & Judd, A. (2014). Does nursing assistant certification increase nursing student's confidence level of basic nursing care when entering a nursing program? *Journal of Professional Nursing*, 30(2), 162-167. doi: 10.1016/j.profnurs.2013.09.002
- Strickland, H. (2013). *Comparing Lasater's clinical judgment rubric scores across faculty, self-assessment & outcome scores* (Order No. 3612141). Available from ProQuest Dissertations & Theses Global. (1505373092). Retrieved from <http://search.proquest.com.jproxy.lib.ecu.edu/docview/1505373092?accountid=10639>
- Sullivan, W., Rosin, M., & Carnegie Foundation for the Advancement of Teaching (2008). *A new agenda for higher education: Shaping a life of the mind for practice*. San Francisco: Jossey-Bass.

- Tanner, C. (2006). Thinking like a nurse: A research-based model of clinical judgment in nursing. *Journal of Nursing Education*, 45(6), 204-211.
- Theisen, J. & Sandau, K. (2013). Competency of new graduate nurses: A review of their weakness and strategies for success. *Journal of Continuing Education in Nursing*, 44(9), 406-414. doi: 10.3928/00220124-20130617-38
- Todd, M., Manz, J., Hawkins, K., Parsons, & Hercinger, M. (2008). The development of a quantitative evaluation tool for simulations in nursing education. *International Journal of Nursing Education Scholarship*, 5(1), 1-17. doi:10.2202/1548-923X.1705
- Tunc, B., Solmaz, B., Parker, D., Satterthwaite, T., Elliott, M., Calkins, M., ... Verma, R. (2016). Establishing a link between sex-related differences in the structural connectome and behavior. *Philosophical Transactions Royal Society*, 371(1688), 1-10. doi: 10.1098/rstb.2015.0111
- Victor-Chmil, J. (2013). Critical thinking versus clinical reasoning versus clinical judgment. *Nurse Educator*, 38(1), 34-36. doi:10.1097/NNE.0b013e318276dfbe
- Wangenstein, S., Johansson, I., & Nordström, G. (2008). The first year as a graduate nurse: An experience of growth and development. *Journal of Clinical Nursing*, 17, 1877-1885.
- Ward, S., Stewart, D., Ford, D., Mullen, A., Makic, M. B., (2014). Educating certified nursing assistants educational offerings on the run and more. *Journal for Nurses in Professional Development*, 30(6), 296–302. doi: 10.1097/NND.0000000000000102
- Waxman, K. T. (2010). The development of evidence-based clinical simulation scenarios: Guidelines for nurse educators. *Journal of Nursing Education*, 49 (1), 29-35. doi:10.3928/01484834-20090916-07
- Wolff, A., Pesut, B., and Regan, S. (2010). New graduate nurse practice readiness: Perspectives on the context shaping our understanding and expectations. *Nurse Education Today*, 30(2), 187-191. doi:10.1016/j.nedt.2009.07.011
- Yuan, H., Williams, B., & Man, C. (2014). Nursing students' clinical judgment in high fidelity simulation-based learning: A quasi-experimental study. *Journal of Nursing Education and Practice*, 4(5), 7-15. doi: 10.5430/jnep.v4n5p7
- Young, A., Willson, P. (2012). Predicting NCLEX-RN success: The seventh validity study of the HESI Exit Exam. *Computers, Informatics, Nursing*, 30(1), 55–60. Doi: 10.1097/NCN.0b013e3182343edf

APPENDIX A



September 9, 2016

Susan Kidd
East Carolina College of Nursing
Health Sciences Building, #2123

Reference #: J19906037

Material Requested: Figure

Usage Requested: In dissertation titled "Measuring of Clinical Judgement During Simulation" housed at ECU.

Citation: Tanner C.(2006). Thinking Like a Nurse: A Research-Based Model of Clinical Judgment in Nursing. J Nurs Educ. 45(6)

Dear Susan,

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Signature: Susan E. Kidd **Date:** 9/22/16

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APPENDIX B



EAST CAROLINA UNIVERSITY
University & Medical Center Institutional Review Board Office
4N-70 Brody Medical Sciences Building Mail Stop 682
600 Moye Boulevard Greenville, NC 27834
Office 252-744-2914 • Fax 252-744-2284 • www.ecu.edu/irb

Notification of Initial Approval: Expedited

From: Social/Behavioral IRB
To: Susan Kidd
CC: Laura Cantt
Date: 10/18/2016
Re: UMCIRB 16-001713
Measurement of Clinical Judgment during Simulation using the Creighton Competency Evaluation Instrument

I am pleased to inform you that your Expedited Application was approved. Approval of the study and any consent form(s) is for the period of 10/18/2016 to 10/17/2017. The research study is eligible for review under expedited category # 6, 7. The Chairperson (or designee) deemed this study no more than minimal risk.

Changes to this approved research may not be initiated without UMCIRB review except when necessary to eliminate an apparent immediate hazard to the participant. All unanticipated problems involving risks to participants and others must be promptly reported to the UMCIRB. The investigator must submit a continuing review/closure application to the UMCIRB prior to the date of study expiration. The investigator must adhere to all reporting requirements for this study.

Approved consent documents with the IRB approval date stamped on the document should be used to consent participants (consent documents with the IRB approval date stamp are found under the Documents tab in the study workspace).

The approval includes the following items:

Name	Description
C-CEI.docx	Surveys and Questionnaires
Demographics.doc	Surveys and Questionnaires
Kidd Consent No More Than Minimal Risk with Itg edits 8-22-16%2529.doc	Consent Forms
Recruitment letter Sept 7.docx	Recruitment Documents/Scripts
Recruitment letter Sept 7.docx	Additional Items

The Chairperson (or designee) does not have a potential for conflict of interest on this study.

APPENDIX C

Hello Students,

The purpose of simulation this semester is to give you an opportunity to learn your strengths and weaknesses in a safe environment. You will not be given a grade on your performance. I am interested in seeing what level of clinical judgment ECU graduating seniors have. The purpose is to collect de-identified data and study what effect if any demographics, work experience, and academic indicators including GPA and HESI™ (E2) scores has on clinical judgment scores using the Creighton Competency Evaluation Instrument. The simulation time will be approximately an hour from start to finish. You will be involved in the actual simulation for about 20 minutes. There will be current drug books for you to use. The scenarios will be cardiac/pulmonary in nature. The focus will be using clinical judgment to make sound decisions about patient care. Clinical judgment involves noticing (so assessing your patient, the environment, etc.), analyzing what you notice, responding, and reflecting. I will let your faculty know that you did participate in the simulation but your level of performance will not be shared. We will de-brief and reflect after your simulation. I look forward to working with you.

Susan Kidd, PhD(c), MSN, RN

APPENDIX D

Date: _____

Time: _____

Number: _____

Measuring Clinical Judgment Using the C-CEI Student Questionnaire

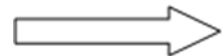
Participation in this study is strictly voluntary. This data sheet has been devised to help gather data about you needed for the study. Please answer the questions as completely and as honestly as possible. Please choose the best response to describe you at this time in your nursing education and mark only one choice for each question unless the question directs you differently. Please circle your response:

1. Gender:
 - a. Male
 - b. Female

2. Age:
 - a. 18-20 years of age
 - b. 21-25 years of age
 - c. 26- 30 years of age
 - d. 31-35 years of age
 - e. 36-40 years of age
 - f. > 40 years of age

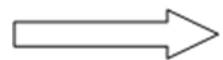
3. Ethnicity:
 - a. African American/Black
 - b. Caucasian/White
 - c. Hispanic
 - d. Asian-American
 - e. Indian American
 - f. Other (Please Specify) _____

4. Employment Status
 - a. Unemployed
 - b. Employed full-time in healthcare
 - c. Employed full-time not in healthcare
 - d. Employed part-time in health care
 - e. Employed part-time not in health care



Continue

5. **Not including time spent in patient care during clinical rotations for course requirements at the East Carolina University College of Nursing**, how much experience in months have you had with direct patient care in a hospital or other acute care setting?
- None
 - < 3 months
 - 4 to 6 months
 - 7 to 9 months
 - 10 to 12 months
 - More than 12 months (Please specify number of months) _____
6. **Not including time spent in patient care during clinical rotations for course requirements at the East Carolina University College of Nursing**, how many hours per month do you currently work providing direct patient care in a hospital setting or other acute care setting?
- < 12 hours
 - 13 to 24 hours
 - 25 to 48 hours
 - 49 to 72 hours
 - More than 72 hours (Please Specify number of hours per month) _____
7. How many simulations have you participated in while a student in the ECU CON?
- None
 - 1 to 3
 - 4 to 6
 - 6 to 8
 - > 8
8. In general, how well do you feel you that you performed during the simulation?
- 93-100
 - 85-92
 - 78-84
 - 70-77
 - <70
9. Have you had to repeat any nursing courses?
- Yes
 - No
10. Were you raised in the United States
- Yes
 - No



Continue

11. English is my
- a. First language
 - b. Second language

12. If English is your second language please specify your first _____

APPENDIX E

Creighton Competency Evaluation Instrument (CCEI)

N 4511 Simulation Fall 2016 Date: ____/____/____ Time: _____		0= Does not demonstrate competency 1= Demonstrates competency NA= Not applicable		_____	
ASSESSMENT 1. Obtains Pertinent Data 2. Performs Follow-Up Assessments as Needed 3. Assesses the Environment in an Orderly Manner		Circle Appropriate Score for all Applicable Criteria - If not applicable, circle NA 0 1 NA 0 1 NA 0 1 NA		COMMENTS: 	
COMMUNICATION 4. Communicates Effectively with Intra/Interprofessional Team (TeamSTEPPS, 5. Communicates Effectively with Patient and Significant Other (verbal, nonverbal, teaching) 6. Documents Clearly, Concisely, & Accurately 7. Responds to Abnormal Findings Appropriately 8. Promotes Professionalism		0 1 NA 0 1 NA 0 1 NA 0 1 NA 0 1 NA			
CLINICAL JUDGMENT 9. Interprets Vital Signs (T, P, R, BP, Pain) 10. Interprets Lab Results 11. Interprets Subjective/Objective Data (recognizes relevant from irrelevant data) 12. Prioritizes Appropriately 13. Performs Evidence Based Interventions 14. Provides Evidence Based Rationale for Interventions 15. Evaluates Evidence Based Interventions and Outcomes 16. Reflects on Clinical Experience 17. Delegates Appropriately		0 1 NA 0 1 NA 0 1 NA 0 1 NA 0 1 NA 0 1 NA 0 1 NA 0 1 NA			
PATIENT SAFETY 18. Uses Patient Identifiers 19. Utilizes Standardized Practices and Precautions Including Hand Washing 20. Administers Medications Safely 21. Manages Technology and Equipment 22. Performs Procedures Correctly 23. Reflects on Potential Hazards and Errors		0 1 NA 0 1 NA 0 1 NA 0 1 NA 0 1 NA 0 1 NA			
COMMENTS		Total: Total Applicable Items: Earned Score			
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APPENDIX F

Creighton Competency Evaluation Instrument (CCEI)

N 4511 Simulation Fall 2016		0= Does not demonstrate competency 1= Demonstrates competency NA= Not applicable		Harold Heardman <u>CHE</u>			
Date _____ / _____ / _____ Time: _____							
ASSESSMENT	Circle Appropriate Score for all Applicable Criteria - If not applicable, circle NA.	COMMENTS:					
1. Obtains Pertinent Data (HR, RR, BP, SpO ₂ , Breath sounds, IV, Pain, LOC)	0 1 NA						
2. Performs Follow-Up Assessments as Needed (HR, RR, BP, SpO ₂ , breath sounds after Lasix)	0 1 NA						
3. Assesses the Environment in an Orderly Manner (Equipment present: O ₂ , SCD's, IV pump)	0 1 NA						
COMMUNICATION							
4. Communicates Effectively with Intra/Interprofessional Team (Team STEPPS, SBAR, Written Read Back Order) (Call MD for crackles, chest pain, ↑ HR and RR, ↓ SpO ₂ , SOB, dry/hacking cough, ↑BP)	0 1 NA						
5. Communicates Effectively with Patient and Significant Other (verbal, nonverbal, teaching)	0 1 NA						
6. Documents Clearly, Concisely, & Accurately (Assessments, meds, communicating with MD)	0 1 NA						
7. Responds to Abnormal Findings Appropriately (Calls MD, stays calm while with patient)	0 1 NA						
8. Promotes Professionalism (Dress and language)	0 1 NA						
CLINICAL JUDGMENT							
9. Interprets Vital Signs (T, P, R, BP, Pain) (↑HR @ Initial assessment, CP, VS continue to change)	0 1 NA						
10. Interprets Lab Results (BNP, Coag, Troponin)	0 1 NA						
11. Interprets Subjective/Objective Data (recognizes relevant from irrelevant data) (crackles)	0 1 NA						
12. Prioritizes Appropriately (Increases HOB with SOB, Calls for crackles, decreases NS, gives Lasix, starts O ₂)	0 1 NA						
13. Performs Evidence Based Interventions (O ₂ @ 2L, 5 minutes between NTG, Morphine – dilutes according to medication book gives morphine over 3 minutes)	0 1 NA						
14. Provides Evidence Based Rationale for Interventions	0 1 NA						
15. Evaluates Evidence Based Interventions and Outcomes (re-assesses pain, o ₂ sat, assesses after after NTG)	0 1 NA						
16. Reflects on Clinical Experience (debriefing)	0 1 NA						
17. Delegates Appropriately	0 1 NA						
PATIENT SAFETY							
18. Uses Patient Identifiers (Name, DOB: Initial and ongoing with meds)	0 1 NA						
19. Utilizes Standardized Practices and Precautions Including Hand Washing (gloves)	0 1 NA						
20. Administers Medications Safely (New Lasix order for 40 mg IVP, NTG, Morphine)	0 1 NA						
21. Manages Technology and Equipment (O ₂ , IV pump, VS/Cardiac Monitor, FSBS)	0 1 NA						
22. Performs Procedures Correctly (FSBS)	0 1 NA						
23. Reflects on Potential Hazards and Errors (Debriefing)	0 1 NA						
					Total: Total Applicable Items: _____ Earned Score _____		

APPENDIX G

Creighton Competency Evaluation Instrument (CCEI)

N 4511 Simulation Fall 2016 Date: ____/____/____ Time: _____		0= Does not demonstrate competency 1= Demonstrates competency NA= Not applicable		Carl Shapiro _____ MI		
ASSESSMENT		Circle Appropriate Score for all Applicable Criteria - (If not applicable, circle NA)		COMMENTS:		
1. Obtains Pertinent Data (HR, RR, BP, SpO ₂ , Pain, Heart, Rhythm, Lungs, LOC, IV)		0	1			NA
2. Performs Follow-Up Assessments as Needed (HR, Rhythm, RR, BP, SpO ₂ , Pain)		0	1			NA
3. Assesses the Environment in an Orderly Manner (Equipment present: O ₂ , IV pump)		0	1			NA
COMMUNICATION						
4. Communicates Effectively with Intra/Interprofessional Team (TeamSTEPPS, SBAR, Written Read Back Order) (Uses SBAR when calling MD, Reads back orders)		0	1	NA		
5. Communicates Effectively with Patient and Significant Other (verbal, nonverbal, teaching)		0	1	NA		
6. Documents Clearly, Concisely, & Accurately (Assessments, communicating with MD, Interventions: O ₂ , fluid bolus, Meds)		0	1	NA		
7. Responds to Abnormal Findings Appropriately (Calls MD: pain PVC's, stays calm while with patient)		0	1	NA		
8. Promotes Professionalism (Dress and language)		0	1	NA		
CLINICAL JUDGMENT						
9. Interprets Vital Signs (T, P, R, BP, Pain) (HR, RR, BP, Pain, SpO ₂)		0	1	NA		
10. Interprets Lab Results (Troponin, K ⁺)		0	1	NA		
11. Interprets Subjective/Objective Data (recognizes relevant from irrelevant data) (pain levels, decreasing BP, PVC's, pt stating I do not g-feel well)		0	1	NA		
12. Prioritizes Appropriately (Gives 1 st NTG, calls MD re: pain and PVC's, increases O ₂ either 4L and/or non-rebreather, BP after all NTG, NS bolus for BP 95/50)		0	1	NA		
13. Performs Evidence Based Interventions (O ₂ @ 4L and/or non-rebreather, BP with NTG) 5 minutes between NTG, Morphine – dilutes according to medication book gives morphine over 3 minutes)		0	1	NA		
14. Provides Evidence Based Rationale for Interventions (Debriefing)		0	1	NA		
15. Evaluates Evidence Based Interventions and Outcomes (Pain reassessments, BP reassessments, O ₂ sats)		0	1	NA		
16. Reflects on Clinical Experience (Debriefing)		0	1	NA		
17. Delegates Appropriately (Debriefing)		0	1	NA		
PATIENT SAFETY						
18. Uses Patient Identifiers (Name, DOB: Initial and ongoing with meds, Allergies)		0	1	NA		
19. Utilizes Standardized Practices and Precautions Including Hand Washing (handwashing, gloves)		0	1	NA		
20. Administers Medications Safely (NTG, Morphine, NS bolus)		0	1	NA		
21. Manages Technology and Equipment (O ₂ , IV pump, VS/Cardiac Monitor)		0	1	NA		
22. Performs Procedures Correctly (O ₂ - connecting to non-rebreather, NS bolus)		0	1	NA		
23. Reflects on Potential Hazards and Errors (Debriefing)		0	1	NA		
				Total: Total Applicable Items: _____ Earned Score _____		

